

Tracing the Signature Dynamics of Language Teacher Immunity

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**Thesis submitted to the University of Nottingham
in partial fulfillment of the requirements for the degree of
Doctor of Philosophy**

March 2016

Abstract

The aim of this thesis is to explore the psychological qualities that set apart L2 teachers who are motivated and committed to the profession, innovative and productive in their practice, and emotionally well-adjusted from those who struggle to survive. To do this I carried out a sequence of four research phases, each building on the design and findings of previous phases. The first of these was a data-driven case study designed to investigate whether teachers who are engaged and motivated, well-adjusted and productive might provide insight into surviving as a teacher. Taking the language teacher as the complex system in which self-organized change occurs, the qualitative interview data suggested that these teachers ($N = 4$) had developed an emergent outcome in response to the accrued disturbances they encountered in their classroom experience. This emergent outcome—which I termed *language teacher immunity*—appeared to function as a defense mechanism against the material and emotional demands placed on L2 practitioners. To validate these findings, I adopted a retrodictive qualitative modeling research template for the remaining phases. The second phase used focus-group interview data from L2 professionals ($N = 44$) to investigate prototypes of language teacher immunity and the salient characteristics (i.e., system components) of each. These initial prototypes fit one of four global categories (i.e., productively immunized, maladaptively immunized, partially immunized, and immunocompromised). Additionally, seven components were found to be essential to the make-up of these outcomes: teaching self-efficacy; attitudes to teaching; coping; classroom affectivity; burnout; resilience; and, openness to change. Phase three triangulated the focus group phase with questionnaire data from a larger

sample of L2 practitioners ($N = 293$). Cluster analysis of this data illustrated a core of six language teacher immunity archetypes distributed across the spectrum of global outcomes. Particular combinations of the seven components at varying levels were exhibited as specific profiles of language teacher immunity. The final phase used in-depth interview data collected from three teachers in each archetype to explore trajectories of development for each outcome, and investigate the manner in which the various archetypes manifested themselves in L2 teachers' sense of professional identity and motivated behavior. The data provided substantiating evidence for mapping these dynamic trajectories using a developmental blueprint (i.e., with triggering, linking, realignment, and stabilization stages) which captured the emerging pattern in these teachers' individual experiences and their pathways of growth. The combined evidence from this research indicates that language teacher immunity plays a significant role in L2 teachers' professional identity and affects how L2 practitioners position themselves in the profession through their accompanying mindsets. Furthermore, language teacher immunity outcomes are displayed in the real-time classroom choices of L2 practitioners, suggesting that language teachers' emotions, teaching motivation, and instructional effectiveness may hinge on the outcome of language teacher immunity that is developed.

Acknowledgements

This PhD dissertation is the result of a long and hazardous journey of research. Not content with the challenge that a research degree would entail, I decided to make it even more exciting by continuing to teach fulltime while I studied. Early on my wife, Eun Hye, who had already been through a similar scenario with my first graduate degree, sat me down and told me that this time it would be more of a “marathon” and not a “sprint”. She was absolutely right. It was never easy, but I’ve enjoyed every minute of it!

To EunHye, if there is one person whose support has made this thesis possible, it is you. Thank you for your patience over the past decade, and for your genuinely no-nonsense criticism when I needed it. Thank you for helping me find the space to read and write without any distractions when I most needed it. Thank you for tolerating my eccentric working hours, for picking up the slack at home, and for just being there for me. To my daughter Chloe, although you are too young to know it now, you have helped keep me anchored to reality. Thank you for all the “thinkermawhizzers” and paintings that have helped me keep my sanity. Between readings of *Matilda* and *The Lorax*, Friday night movies with popcorn, and spontaneous scoops of gelato I have come to realize what my priorities in life are.

To Zoltán, my mentor, role model, and advisor extraordinaire: you have taught me that great teachers don’t tell their students what to do; they only create the conditions in which they can do it themselves. I now also know they have a healthy sense of humor! There really is truth in the saying that “you cannot do great things until you have seen great examples.” For me, you have been that example. The times

spent talking, brainstorming, and learning from you were unforgettable, exhilarating, and also mentally exhausting. You epitomize the passion and energy I want to live my own life with, and I have been truly fortunate to have the opportunity to receive your guidance. More importantly, you have inspired me. Thank you.

To the many language teachers I have had the privilege of meeting and working with over the past few years, this research would never have been possible without your generosity and time. Thank you for trusting me enough to invite me (an outsider) into your professional lives, and for sharing your reality, your experiences, and your hopes and fears. As a teacher educator, researcher, and language teacher, I have learned an untold amount from you all. Thank you also to all my family for believing in me and for giving me the opportunity to set out on this path many years ago. And, last but not least, thank you to all my friends here and abroad, too numerous to name, who have given me moral support throughout the past few years despite me going MIA socially.

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1. Introduction

1.1 Background of the Research

I am a teacher. At least I hope that those closest to me will say that I am. This is quite ironic because, even though I come from a family of teachers, I promised myself early on that I would have nothing to do with teaching. The joke is obviously on me. I now believe that teachers' work is more likely to determine the human race's chance for survival than anything else. This new perspective has of course also been influenced by becoming a father. Listening to my daughter talk about her own teachers sometimes gives me reason to pause, even though my students are really adults in training to be teachers and not kindergarteners. I have met, worked with, and talked to teachers of all kinds—literally hundreds of them. I have met the kinds of teachers that I would want my own daughter to have every day of her school life, and the kinds that I honestly could not understand why they wanted to be anywhere near a classroom at all. I do not say this lightly, and as a second language teacher educator, my own sense of responsibility is several orders of magnitude higher given that I have the opportunity to interact with and, potentially, influence these teachers, both at the pre- and in-service stage. Thus I began asking myself, fairly early on, what I could do as a K-12 teacher educator to ensure that the language teachers I was privileged to work with would be like those in the former group, and not like those in the latter.

I did what most teacher educators do: my job involved helping them take what they knew and translate that into what they could do with it in the classroom. I worked with the teachers I got and I accepted where they were at professionally. I helped them find effective teacher models and provided regular feedback to their own

teaching. I asked them what their values were and why they did things the way they did to help them develop critical reflective skills. I followed their progress long after they were placed in or returned to teach in their public school L2 classrooms. But all of this seemed more superficial than anything. The majority of instructed language learning worldwide occurs in increasingly diverse K-12 classrooms, where languages are often compulsory subjects taught in large, mixed-ability groups. Every educational setting has inane policies and inhibiting contextual factors, but I simply could not say for certain whether what I spent my waking days doing was having any impact on these pre- and in-service teachers, and if so what kind. I was even less confident that there was any effect on the classrooms full of bright-eyed language learners these individuals were responsible to. I continued going through the motions, but began questioning the very utility of what I was doing in second language teacher education. As most teachers can recount, their students will rapidly pick up on their vibes, and because I didn't believe in what I was doing any more that is exactly what happened. Finally, one summer I met with a graduating class of teachers and, apart from congratulating them, told them why I believed we had just wasted several semesters worth of time together. While all of them admitted the many symptoms I pointed to—for example, built in contextual challenges and restrictions on teacher autonomy, teachers going on auto-pilot and following pathways of least resistance in their practice—none of them were ready to accept that our time together was a lost cause. I am glad they were not.

Academically, at this stage in life I had already written an MA thesis on the potential of possible selves theory and self-discrepancy theory to account for teacher motivation and choices of behavior. This meant that I was more or less convinced of

the potential of a psychological perspective in providing deeper insights into the lives of language teachers. I was also fortunate enough that Zoltán Dörnyei had once again agreed to supervise my research, this time at the PhD level. Parallel to this, I began immersing myself unreservedly in complexity theory. But without knowing the right questions to ask, there were no obvious solutions or answers to the issues I was facing professionally. I remember clearly that in one of my earliest PhD supervision meetings, Zoltán asked me to tell him what it was that I wanted to know or find out. This was surprisingly difficult, but gradually I must have been able to articulate something coherent because by the end of our meeting Zoltán announced that I needed to begin with some data. Without knowing it, in suggesting this small-scale exploratory study as a way to initiate my research degree, Zoltán also created the impetus that helped me clarify my thinking, gain priceless insights into the inner lives of language teachers, and rediscover the fundamental purpose of my task as a second language teacher educator. In total, I conducted four studies in sequence to explore what really does go on inside the mind of a language teacher, and these are what form the basis of the following section on the scope of my thesis.

1.2 The Scope of the Research

My thesis contains several studies that could be seen as a sequence of steps in which I explore the issue of precisely what psychological qualities set apart L2 teachers are motivated and committed to the profession, innovative and productive in their practice, and emotionally well-adjusted from those who are just the opposite and struggle to even survive. My explicit use of a complexity theory framework in

designing these research steps is in line with recent calls from both general and language education for a more developmental orientation of studies of teacher identity and motivation (Dörnyei & Kubanyiova, 2014; Richardson, Karabenick, & Watt, 2014). As my research findings bridge individual concerns with wider contextual considerations, they touch on key concerns in language teacher education and issues at the heart of the language teaching profession: whether it can produce a body of professionals who are adaptive to changes in the face of the rapid development of knowledge and society; whether it can retain practitioners who are enthusiastic and committed; and whether, against the odds, language teachers can function at the peak of their effectiveness and thrive in a classroom.

The first study was a data-driven case study of four language teachers who were thriving in their own right. The data were primarily qualitative, and exploratory. Following this I adopted a comprehensive *retrodictive qualitative modeling* research template, conceived of as an analytical method for investigating how complex, self-organized patterns are juxtaposed with dynamic mechanisms of development (Dörnyei, 2014). Step one of the RQM template included both the first and second validation studies. In the first phase I conducted focus-group interviews with groups of L2 practitioners from various teaching settings and language teacher educators/program administrators; In the second I administered a questionnaire to a separate sample of language teachers to build on findings from the initial validation phase. In the final of the four studies, which could also be seen as the third phase of validation using RQM, qualitative interviews were once again the dominant form of data. These were conducted with participants who had been selected from the quantitative data set of the previous study, and focused on the implications, both

theoretical and applied, of the research as a whole. I provide further details about the research design, participants, instruments, and procedure in chapter five of my thesis.

1.3 The Structure of the Thesis

This thesis is structured around three main sections: a literature review (i.e., chapters two, three, and four), (2) the method section (i.e., chapter five), and (3) the results and discussion (i.e., chapters six, seven, and eight). I begin with a review of the relevant literature in chapter two by exploring key areas in what might be termed the “teacher psychology literature”: who teachers are, and why and how teachers construct their place in the profession. This includes an overview of notions such as teacher identity, and the affective-motivational aspects of what drives teachers. Chapter three then examines the current understanding of shielding systems capable of safeguarding the individual, first from the biological domain and then from a psychological perspective. By reviewing concepts with origins in occupational, developmental, and educational psychology, as well as immunology, this section attempts to build a sophisticated understanding of the metaphorical construct that I link the findings of my research to in later chapters, teacher immunity. In chapter four I shift my focus to exploring the utility of *complexity theory* as a conceptual framework for my thesis. This chapter examines the ways in which complexity theory might inform applied linguistics research and assist in plugging gaps left by conventional research paradigms. As such, it functions as a bridge between my review of several diverse areas of literature in chapters two and three, and the outline of my research methods in chapter five.

Chapter five first outlines key facets of the research context for all four studies that are part of this thesis, South Korea. Following this, I present the methodological details (i.e., the participants, procedure, instruments, and data analysis) of each self-contained study sequentially. I have chosen to do this primarily because it provides a transparent narrative of how each subsequent research phase builds on the design and the findings of previous phases. In chapter six, I present the results of the four studies in much the same way, not only for coherence in the research narrative, but also because this pattern is consistent with the research logic of complexity theory in which complex dynamic phenomena are presented in developmentally-conscious ways, focused as much on outcomes and manifestations, as on developmental trajectories. Chapter 6 begins with my findings from the initial exploratory study, that certain language teachers develop an emergent outcome, through the accrued disturbances they encountered in their classroom experience, which appeared to function as a defense mechanism against the material and emotional demands which are part of their practice. I termed this *language teacher immunity*. The next two sections are devoted to presenting the findings of the validation phases in which I identified the typical profiles of teachers with this emergent phenomenon, and the complex makeup of these specific teacher archetypes. I then present the findings of the final validation study which revealed individual trajectories of development for each outcome of language teacher immunity, and provided insight into how the various teacher immunity archetypes manifested themselves in L2 teachers' sense of professional identity, their motivation and emotion, and their classroom practice.

Chapter seven combines the many threads from these four studies by tying them together in a thematic discussion. This discussion centers on the original

contributions of the research findings and the implications of language teacher immunity for the field of second language teacher education. This is extended through a discussion of some key concerns in the psychology of language teachers. Finally, chapter eight concludes with a discussion of the limitations of the research design and explores an agenda for future research. Incorporated into several chapters of my thesis are portions of previously published papers that are the result of work done or data collected during my period of study as a research student at the University of Nottingham. This includes excerpts that appear in 2 chapters from an edited anthology on motivation in language learning (Hiver, 2015a; Hiver 2015b), from one co-authored conceptual paper that is in press (Hiver & Dörnyei, in press), and another co-authored methodological paper (Hiver & Al-Hoorie, 2016). The majority of these sections have been substantially reworked through paraphrasing and/or reorganization so as not to be overly derivative of this previous work.

2. Inside the Mind of the L2 Teacher

2.1 Introduction

The purpose of this section is to explore key areas in what might be termed the “teacher psychology literature”. The focus of this thesis is ultimately second language teachers, and throughout I attempt to situate this thesis within the concerns and discourse of second language teacher education (SLTE). However, the relative lack of theorizing regarding language teacher psychology (see Kubanyiova & Feryok, 2015 for one recent exception) makes it necessary to also take a broader view of research and theory regarding the teaching profession more generally. The literature reviewed in this section ranges from fields as diverse as occupational psychology, teacher education, second language pedagogy, and educational psychology. Nevertheless, the many instances of “teacher” throughout should also be seen as representing “language teachers”.

Perhaps the most fundamental aspect inside the mind of a teacher is who they are or who they see themselves as. Therefore, I begin by providing an overview of notions of teacher identity and the variety of ways it has been conceptualized—none of which should be taken as mutually exclusive. Following this I explore the affective-motivational facets of what transpires inside the mind of practitioners. What is it that drives teachers? Here I review some of the psychological adversities teachers face in order to highlight the positive factors which may enable teachers to thrive. This review of the literature suggests that these two concepts (i.e., teacher motivation and teacher emotion) cannot, in fact, be seen as discrete constructs as one implicates the other at every turn. I frame these sections exploring the questions of *who* teachers

are, as well as *why* and *how* teachers construct their place in the profession, as central to the concerns of teacher cognition and professional practice.

2.2 Discovering the ‘Who’: Teacher Identity

Because it incorporates multifaceted notions of the self, identity is a profoundly complex concept. While identity may not be tangible or immediately observable, it is expressed and manifested phenomenologically in the form of beliefs, assumptions, values, and actions as well as in the various ways that an individual perceives and interprets oneself and the world at large (Harter, 1999). Consequently, the study of identity has gained a great deal of attention in a variety of disciplines with a variety of applications (Leary & Tangney, 2012).

Who, or what, is a teacher? Historically speaking, there are two main lines of conceptualizing or theorizing teacher identity. The first of these comes from the work of the psychologist Erik Erikson. The Eriksonian notion of identity pertains to ideas of stability and coherence (Horn, Nolen, Ward, & Campbell, 2008). In this context, coherence refers to the enduring quality of an identity, meaning its stability over time for a given individual (Day, Kington, Stobart, & Sammons, 2006). This, of course, suggests that identities are also unstable at times, and susceptible to change in response to extrinsic factors (Alsup, 2006). The second perspective comes from the work of the sociologist George Mead. This frame of reference for identity focuses on the formation of identities and the ways in which individuals can accomplish this identity construction, primarily through interaction with other individuals in the context of different roles (Danielewicz, 2001; Sørreide, 2006). The reality, it appears,

is likely to be a combination of these two lines of thinking, where both aspects are represented in the identity-forming process. For the sake of convenience, identity can be thought of as a construct composed of self-perceptions, roles, values, and beliefs (Bukor, 2014). Because such a range of factors are involved, there are many theories which seek to account for the phenomenon of identity (see Leary & Tangney, 2012; Schwartz, Luyckx, & Vignoles, 2011 for two book length overviews).

Professional identity forms the foundation for examinations of teacher identity (Beauchamp & Thomas, 2011). Furthermore, in attempting to understand the ways in which teachers work, learn, and develop notions of identity have emerged to help enhance scholars' understanding of these elements (Akkerman & Meijer, 2011). Understanding how identity might clarify these aspects of professionalism can in turn highlight how these elements contribute to the formation or development of professional identity.

2.2.1 Experiential aspects of teacher identity

As scholars have probed the concept of teacher identity, what has emerged is the notion of multiple identities. The premise of multiple identities is that an individual's identity is actually a collection of identities rather than a singular construct (Martel & Wang, 2015; Varghese, Morgan, Johnston, & Johnson, 2005). From such multiplicity it is likely that an individual's job or career experiences will affect aspects of one's identity related to that job or career. Thus, studying the experiential origins of teacher identity provides an important perspective on how to support teachers' well-being and professional development.

The development of professional identity is a process that often begins with the education and training in preparation to assume membership of an individual's chosen profession (Yuan & Lee, 2015). This is very much the case for teacher identity. Because people are not born teachers, they must become teaching professionals, implying a formative process (Day, Kington, Stobart, & Sammons, 2006). However, while acquiring practical and pedagogical skills and obtaining the proper certifications and licenses are all necessary to becoming a professional, they are only a fraction of what identity growth really entails (Flores & Day, 2006). Though teacher identity is by necessity a professional identity, it can also be informed by *personal practical knowledge* which is experiential (Beijaard, Meijer, & Verloop, 2004; Golombek, 1998). Such experiences are not necessarily characterized as being only personal or professional, though they can be derived from personal or professional experiences and can be applied to either type of situation. Nonetheless, personal practical knowledge that is used in the context of the classroom is by default an aspect of professional identity (Beijaard, Verloop, & Vermunt, 2000). Thus, the experiential creation of this personal practical knowledge is not only part of the formation of a professional teacher identity, it may also be a product of the formation of personal identity (Morton & Gray, 2010; Tsang, 2004).

Akkerman and Meijer (2011) offer a dialogical approach to conceptualizing teacher identity, arguing that identity is paradoxical and dichotomous, meaning that it can be both an individual experience as well as a social or community-based one, both singular and multiple, continuous and discontinuous (see also Burkitt, 2011; Berzonsky, 2011). This accommodates both the views of Erikson and Mead with regard to identity. This notion is also expressed in Trent's (2015) recent proposal of a

multifaceted, multidimensional framework for investigating and understanding teacher identity. Identity from this perspective is composed of an interrelated matrix that features agency and discourse, practice and language, and intrapersonal, interpersonal, and institutional elements (see also Norton & Toohey, 2011; Tsui, 2007). Trent's (2015) framework, thus, seems to readily accommodate the multifaceted and fluid nature of a teacher's professional identity, composed of both internal and external factors. Developing an identity through professional experience is a crucial part of the process of learning to be a teacher (Akkerman & Meijer, 2011; Olsen, 2008), hence its increasing appearance as a topic of research in the literature (Martel & Wang, 2015).

2.2.2 Relational aspects of teacher identity

There are a variety of experiences with others that pre-service or novice teachers participate in which drive the development of professional teacher identity (Beauchamp & Thomas, 2009). These relational encounters integrate individual- and role-based identities, and thus implicate both the interpersonal and collective levels of self (Flores & Day, 2006). Relational identity, thus, refers to one's roles vis-à-vis other individuals in their sphere. In their study, for example, Morton and Gray (2010) reported on how lesson planning conferences in pre-service courses engendered the construction of novice L2 teachers' personal practical knowledge as well as their professional identities. These conferences functioned as communities of practice for joint enterprises "in which there is mutual engagement in pursuit of common goals through a shared repertoire of practice" (Morton & Gray, 2010, p. 299). The idea of communities of practice emerged from the work of Etienne Wenger, who

characterized learning as trajectories of participation which enable the interrelation of knowledge development and identity formation (Wenger, 1998). Within these communities one is able to achieve competence in a setting where the individual is recognized by others as well as oneself as a part of that community, a phenomenon which additional scholars have asserted is a critical part of identity formation (Chen, Boucher, & Kraus, 2011; Lasky, 2005). This suggests that the type of activities in which student teachers participate in will play a role in the formation of their professional identities, especially in circumstances where they are challenged to identify solutions and enhance their personal practical knowledge (Beauchamp & Thomas, 2009, 2011).

Pillen, Den Brok, and Beijaard's (2013) emphasis on support, located in the teachers' school community and the wider professional community, reflects the fact that the construction of identity is—as other scholars (see e.g., Farnsworth, 2010; Gu & Benson, 2015) have noted—social as well as individual. For their part, Wilkins, Busher, Kakos, Mohamed, and Smith (2012) proposed the idea that the construction of professional identity is actually a cooperative process that occurs between new teachers and their students, a notion also explored by Britzman (2003). The co-creation of a professional identity through this process is not as well-understood as the processes which occur as a result of professional colleague interaction or the influences of mentors and school administrators (Den Brok, van der Want, Beijaard, & Wubbels, 2013). Professional interaction with colleagues is usually conceived of as emerging from within the profession itself, while the influence of administrators is exerted through policies and accountability and therefore not necessarily from within

the parameters of the profession (Horn, Nolen, Ward, & Campbell, 2008; Sachs, 2001).

2.2.3 Developmental aspects of teacher identity

Most people regard identity as something that does not change (Luyckx, Schwartz, Goossens, Beyers, & Missotten, 2011). However, because it can be characterized as experiential and relational (see above), it is also by definition dynamic. The reality is that identity is fluid and most certainly can change over time, often regularly, even if only in small ways (Beijaard, Meijer, & Verloop, 2004). Teacher identity must, therefore, be thought of as a constant work in progress; its roots are in the apprenticeship of one's observation, but its future development is in no way deterministically determined (Watson, 2006).

In his study of the early practicum experiences of language teachers, Trent (2013) concludes that current teacher education models often contain the potential for antagonistic scenarios which jeopardize the ability of pre-service teachers to engage in effective professional identity formation. Others have framed these challenges to identity as including difficulties adjusting to professional life as well as problem-solving in the classroom (Liu & Xu, 2011; Trent, Gao, & Gu, 2014). Some researchers have proposed that placement and mentoring programs need to be rethought, bearing in mind an emphasis on resources which would support the identity work of the student teachers participating in those practicum opportunities (Jenlink, 2014). It is clear that such programs should provide opportunities for practice and application, but Trent (2013) has argued that in order to truly support pre-service teachers, identity work must also be supported. These lines of teacher identity

scholarship suggest that while the acquisition and application of professional knowledge are important, they should not be the only foci of a teacher education experience (Britzman, 2003; Varghese, 2011). Actual professional teaching will demand the use of skills and experience from both personal practical knowledge and professional knowledge—a holistic approach, in other words (Bukor, 2014). If teacher education experiences are intended to ease the student teacher into the professional setting, these experiences must also be holistic, thereby facilitating the development of professional identity in several ways—cognitively, socially, and emotionally (Yuan & Lee, 2015).

Teacher identity development continues in earnest once a student teacher becomes a fully-fledged professional. Among other developmental influences, contextual experiences have the potential to both positively and negatively influence the formation of professional identity. For instance, Pillen, Den Brok, and Beijaard (2013) observed that the transition from student/learner to teacher creates tensions which influence the development of identity. These tensions arise from the expansion and modification of individual roles, greater responsibilities to one's students, and how an individual's orientations change with regard to learning and teaching (Hong, 2010; Pearce & Morrison, 2011). Over time these tensions change as the individuals adjust and gain experience. The difference in this type of development is that it shifts instead to the ways in which experiences influence that identity and how the individual reacts to those experiences. Because many new teachers struggle profoundly to establish a professional identity during their first years as a professional, these scholars agree that positive adjustments which can result in resolved identity

tensions are more likely if the new teachers have the right kind of support and mentoring (Thomas & Beauchamp, 2011; Trent, 2013).

Although most often used as an approach to understanding personal rather than professional identity, *possible identities* (Oyserman & James, 2011) are one other useful way to understand how identity can shift and change during the career trajectory of a teacher. When individuals consider what they hope to accomplish in the future as well as their potential to do so, they are essentially creating future versions of themselves – hence the name possible identities (Oyserman, Elmore, Smith, 2012). These possible identities are an individual’s working theories of who they may become, based on their current assessments of characteristics, strengths, and weaknesses, as well as assessments of what is possible (Pisarik & Shoffner, 2009). Within this possible identity framework, the *ideal* represents the teacher’s idealized version of what they could be or become; the *feared* possible identity contains the undesired representation of a future identity; the *ought* refers to the individual that one feels obligated to become (Hiver, 2013; Kubanyiova, 2009, 2012). These identities of the future are, by necessity, connected with one’s present identity since the events which will carry the individual to those future points in time will undoubtedly have an impact on the development of the individual (Peetz, Wilson, & Strahan, 2009; Pronin & Ross, 2006). The identity of many novice or pre-service teachers is embryonic, and many report not feeling like professionals (Kanno & Stuart, 2011). Who they are will change as they gain experience and as their roles expand and develop (Livingston, 2014). Possible teacher identities, thus, highlight “the importance and dynamics of self-relevant, future-oriented self-concepts, and how these self views relate to

motivation for present and future action” (Hamman, Gosselin, Romano, & Bunuan 2010, p. 1351).

2.2.4 Narrative aspects of teacher identity

While some processes in identity construction—such as the relational or experiential aspects—are more implicit, others such as narrative formation are more deliberate (McAdams 2008). The idea that identity is both (a) storied in nature and (b) voiced into being is fundamental for many conceptualizations of self in psychology (Gregg, 2006; Polkinghorne, 1988; Raggatt, 2006; Sarbin, 1986). These authors all suggest that narratives function to express, shape, and internalize disparate features of human identity. Narratives have also gained increased popularity in applied linguistics because scholars are realizing how much more they are than simple verbal descriptions of things (see e.g., Barkhuizen, 2014; Barkhuizen, Benson, & Chik, 2014; Kalaja, Menezes, & Barcelos, 2008; Kasper & Prior, 2015; Pavlenko 2002, 2007; Ryan & Irie, 2014). There is a growing literature to support the notion that humans structure perceptions and experiences largely in the form of narratives, selectively internalizing components of our life stories which allow us to establish a stable core sense of identity that will in turn determine our well-being and purpose, and shape our behavior (Bauer, McAdams, & Pals, 2008; McAdams, 2001, 2006). From this perspective, narratives are so powerful that, in effect, individuals become the narratives that they construct about their lives (Bruner, 1986; Hermans, 1996; McAdams & Pals, 2006). In the struggle to safeguard the coherence of one’s narrative identity, individuals—including teachers—often use autobiographical reasoning, that is the tendency to assign causal and thematic coherence to experience by drawing

conclusions about the self from autobiographical episodes (Connelly & Clandinin, 1990, 1999; Singer, 2004).

Søreide (2006), for instance, examined how five female Norwegian elementary school teachers employed narrative resources as a means of creating and navigating their teacher identities. An examination of the narratives used by the teachers revealed 30 subject positions, reflecting possible roles, as well as four specific identity constructions (Søreide, 2006). These were not choices per se, as the teachers manifested all of these constructions, a fact which echoes Trent's (2015) recommendation to employ a multifaceted, multidimensional perspective to understanding teacher identity. In fact, others have argued that teachers must employ all of these constructions as part of being teachers because the many roles associated with being a teacher find expression through these narrative identities (Carter, 1993; Johnson & Golombek, 2002). In their study of teachers learning to teach on the job, Schultz and Ravitch (2013) discovered that as part of a writing group, these individuals used narratives as acts of meaning to capture the complex processes of learning to teach. By doing so, these teachers narrated their professional identity into existence in the context of their schools, classrooms, and communities, as well as the current political context of their teaching. Incidentally, Søreide (2006) argued that a narrative understanding of teacher identities negates the idea that "ready-made and universal identities" for teachers exist, echoing the individual nature of identity construction and expression in agency.

2.2.5 Contextual aspects of teacher identity

Much of the literature I have reviewed above has applied broadly and equally to all teachers; however, with particular regard to L2 teachers, the influence of cultural factors on the process of developing teacher identity must also be considered (Norton & Toohey, 2011). Language has cultural dimensions which have the potential to influence how categories such as race, gender, sexuality, and socioeconomic status are regarded and expressed within society (Gu & Benson, 2015; Morgan, 2004). These categories are also intimately related to the formation and expression of personal and professional identity; therefore, language can also be seen as having an influence on the formation and expression of these identities. There are often conflicting cultural issues which emerge in the teaching of language, and such conflicts can influence the development and expression of teacher identity (Horn, Nolen, Ward, & Campbell, 2008; Tsui, 2007). This, according to Menard–Warwick (2008), necessitates an increase in both the pedagogical awareness and acknowledgement of the cultural issues and resources which intercultural and transnational teachers—as conveyed through their teacher identities—bring to the language classroom. Gao (2012) has written that teacher identity can, in the language classroom, serve as a kind of pedagogy through which language teachers can interact with students and with language. This is an excellent demonstration of how teacher identity is individual and social, paradoxical, and dichotomous. Teacher identity formation becomes as much about the context and the learners in that context as it is about the individual teacher.

In her application of sociocultural methods to the topic of teacher identity, Lasky (2005) examined how reform initiatives have the potential to affect teacher

identity, finding that significant discrepancies existed between teacher identities and externally imposed reform mandates. Using the perspectives of agency and professional vulnerability, Lasky (2005) determined that teacher identity was affected by early influences on the individual in the professional context. Reform mandates, for instance, have been found to interfere negatively with teacher identity in multiple ways, but of particular concern is the effect on the teacher's agency (Datnow, 2012). This, in turn, can interfere with the teacher's ability to be professionally vulnerable with their students and facilitate their learning which, in turn, interferes with their professional identity (Hargreaves, 2001; Zembylas, 2003a, 2003b). These findings yield significant information regarding the influence of social and political factors on education and educators (Lim, 2011; Morgan, 2004; Simon–Maeda, 2004). Clarke (2009) and Gu and Benson (2015) agree that the construction of identity is the product of political influences, in addition to individual, social, and personal factors. Lasky's (2005) findings also point back to the idea of teacher identity as being a relational, community-based experience, for better or worse.

Finally, Clarke's (2008) examination of the ethical dimensions of identity formation, add yet another layer to the construction of teacher identity. This echoes earlier discussions of the multifaceted, multidimensional quality of identity formation. In his study, Clarke (2008) argued that ethical agency in the context of identity formation is a necessary element, given that individual agency enables the ability to make moral choices. Clarke (2008) proposes that the ethical aspects of identity creation are important and should be a part of identity work. One might think of Clarke's consideration of the ethical dimensions of identity formation as a critical perspective on recent work that examines notions of teacher quality and good, or

effective, teachers (Chingos & Peterson, 2011; Hanushek & Rivkin, 2010; Stronge, Ward, & Grant, 2011). The notion of what makes a “good teacher” emerges as a core concept of professional identity among teachers worldwide, but the problematic premise for many other scholars is that defining what teacher professionalism and effectiveness is now falls under the remit of educational administrators and governmental organizations, a further example of managerial professionalism and arbitrary performativity demands (Connell, 2009; Sachs, 2001). Ultimately, when the parameters of “good teachers” are not defined by the professionals implicated in the identity work themselves, these externally imposed notions interfere significantly with how individual teacher identity may be constructed. Acknowledging the role of teacher identity in how an individual establishes themselves as a professional practitioner is certainly a reflection of a growing interest in the life inside the mind of teachers, and despite the variety of ways that identity has been conceptualized, the consensus regarding its fundamental significance for teacher cognition, motivation, and practice should come as no surprise.

2.3 Discovering ‘Why’ and ‘How’: Teacher Motivation and Emotion

The question of why people do what they do is one of the most fundamental, and has been the focus of inquiry in many fields of study. Beginning with philosophy and through many other iterations to the present day, it is now a central topic for organizational, personality, and social psychologists. The question of what motivates people is also one that has received significant attention in the realm of education. After all, the question of what motivates people to learn is perhaps central to the many concerns of educational research (Wentzel & Brophy, 2014). In understanding the

factors which prompt people to pursue learning, educators hope to capitalize on those factors and more fully engage learners in the learning process. In their recent comprehensive edited review of the educational motivation literature, Wentzel and Wigfield (2009) suggested that it is simply not feasible to capture all the influencing factors and their relations in motivation research and construct a grand unified theory of motivation. As a result, by definition current motivational theories present a partial picture of motivational processes in educational environments (Kaplan, Katz, & Flum, 2012).

Compared to the magnitude of research in general education and learning, the domain of teacher motivation research is still emerging. While major theoretical frameworks from motivation research—self-efficacy, achievement goals, expectancy-value theory, enthusiasm and interest, possible selves, and autonomous and controlled motivation—have all been applied to the analysis of teacher motivation, the field of teacher motivation is still in its infancy relative to the body of existing research on student motivation (Urdan, 2014). However, the question of what motivates teachers to teach is of no less importance, given that any educational intervention to engage and motivate learners must also consider practitioners' motivations to enact these in their classrooms (Kaplan, 2014). To some degree the focus of teacher motivation is on recruitment and retention—that is, how to get and subsequently keep teachers teaching—topics that are all dealt with in detail in this section. Importantly, exploring questions of teacher motivation raises the inevitable question of emotion and its role in the teaching process, not to mention the ways in which motivation and emotion intersect. This section of the literature review will examine issues of teacher

motivation and emotion, and the ways in which these two phenomena intersect and interact.

2.3.1 Teacher motivation

The notion of teacher motivation accounts for the drive, energy, sense of purpose, and commitment an individual has to engage in teaching as a sustainable professional activity. The importance of motivation in the context of teaching begins well before the teacher enters the classroom with regards to what it is that motivates various individuals to become teachers in the first place, as this can have a profound impact on how they fare once the “rubber hits the road” (Richardson & Watt, 2010). In fact, a significant portion of teacher motivation research explores what it is that draw individuals to join the profession, and investigates these driving forces in student teachers, pre-service teachers in training, and novice teachers (Watt & Richardson, 2012). As has been observed by some scholars, teaching is not necessarily the most lucrative profession when compared to others, nor does it convey the highest social status, yet people continue to enter educational programs and the profession itself (Alexander, 2008). What, then, draws individuals to the field? In general, findings on related studies have demonstrated that the motivation to teach can be clustered into the altruistic, extrinsic, and intrinsic categories (Müller, Alliata, & Benninghoff, 2009; Retelsdorf, Butler, Streblow, & Schiefele, 2010; Visser-Wijnveen, Stes, & Van Petegem, 2014). Altruistic reasons refer to internal factors such as love for, passion, and desire to work with learners, as well as a personal or moral mission to serve society. Extrinsic concern external influences such as material benefits, social status accorded teachers, and job security. Intrinsic reasons are those internal desires

for personal growth, development, and meaningfulness often found in educational settings.

These three factors, however, do not necessarily act in concert, and also seem to vary across cultural and country boundaries (Klassen, Al-Dhafri, Hannok, Betts, 2011). While it seems that altruism, service-oriented goals, and other intrinsic factors are the primary movers in many contexts, others report that individuals join the field because of a desire to work with children and adolescents, the potential for intellectual fulfillment, and as a means by which to make a social contribution (Mansfield & Beltman, 2014). This latter collection of motivations arises from Canada, several European countries, the United Kingdom, and Australia. However, studies in other countries including several African or Asian countries, Jamaica, and the Caribbean identified primarily extrinsic motives including pay, job security, and career status, suggesting that because sociocultural contexts play a significant role in shaping initial teaching motivations, they must also be considered (Watt & Richardson, 2012).

However, even within a single sociocultural context “the heterogeneous nature of the teaching workforce suggests that teachers will have different kinds of motivational profiles, which will result in varying responses to local school cultures” (Richardson & Watt, 2010, p. 141). In other words different people will have different motivations for pursuing a career in teaching, even those individuals with similar sociocultural backgrounds. And the context in which a teacher works can influence and change those motivations, regardless of how those motivations may have begun within the teacher (Madni, Baker, Chow, Delacruz, & Griffin, 2015).

2.3.1.1 Autonomous vs. controlled motivation

One means of conceptualizing teacher motivation can be found in self-determination theory (SDT), with several researchers pointing to this theory as being particularly relevant to teacher motivation (Richardson & Watt, 2010; Roth, 2014). SDT is a broad theory focused on the reasons why people do what they do, the relationship this has with personality, and how these aspects influence one's ability to grow and address psychological needs. According to SDT, motivation to engage in any behavior occurs on a continuous range from extrinsic (i.e., controlled) motivation to intrinsic (i.e., autonomous) motivation. From this perspective, motivation is not just based on quantity (i.e., how much motivation a person experiences), but also on the quality of one's motivation to perform tasks or achieve goals (Deci & Ryan, 2000; Sheldon, Turban, Brown, Barrick, & Judge, 2003). Self-determination theory suggests that people must feel autonomous, be aware of their strengths and weaknesses, understand how their needs can be met, feel capable in their abilities, and connect to those around them (Deci & Ryan, 2002; Ryan & Deci, 2009). Autonomous motivation is crucial to motivated teacher behavior because of educators' inherent tendency to exercise their intellectual capacities, to explore and assimilate new knowledge, and to seek out novelty and challenges (Niemic & Ryan, 2009). For teachers, this means if they enjoy the process of teaching and engage enthusiastically in those tasks which make up teaching, they will exercise volition and choice, achieve a sense of personal accomplishment and satisfaction, and fully realize their abilities (Roth, Assor, Kanat-Maymon, & Kaplan, 2007).

Teacher motivation, and emotion for that matter, does not exist in a vacuum; they are nested in classrooms of learners, which are themselves embedded in

institutions, in communities, and the in broader sociocultural context (Radel, Sarrazin, Legrain, & Wild, 2010). It is therefore necessary to take a step back and examine the factors which impact teacher motivation, both intrinsic and extrinsic factors. Any categorization may be more simplistic than the multiple and simultaneously activated antecedents and outcomes of teacher motivation, yet it functions as a helpful heuristic that cuts across various theories (Roth, 2014). Intrinsic factors are those which emerge from within the individual, so to speak. These include personal factors such as satisfaction of needs and interests, dedication to beliefs and values, pursuit of goals, and the emotional payoffs of satisfaction and enjoyment, to list just a few (Chirkov, 2009). Extrinsic factors are those which work on the individual, from without and are derived from the influence of some kind of external incentive, distinct from the wish to engage in education for its own sake, where actions are performed to achieve some kind of result or even due to the endorsed value of a task. Just as intrinsic and extrinsic drivers play a role in the learning process, so too do they motivate teachers in the teaching process (Alexander, Grosnickle, & List, 2014).

The link between the quality and origin of teachers' motivation and classroom practice is unsurprising (Butler & Shibaz, 2008); indeed, most of the existing evidence in teacher research is consistent with the predictions of SDT (Roth, Assor, Kanat-Maymon, & Kaplan, 2007; Roth, 2014). For instance, teachers who are more autonomously motivated reported more autonomy support toward students (Pelletier, Seguin-Levesque, & Legault, 2002; Reeve, 2006), more mastery-oriented goals leading to more adaptive teaching strategies and better teaching performance (Taylor, Ntoumanis, & Standage, 2008; Soenens, Sierens, Vansteenkiste, Dochy, & Goossens, 2012), higher links with feelings of accomplishment (Moller, Deci, & Ryan, 2006),

greater support for students' engagement in learning activities (Butler, 2007), deeper value for the subjects they teach and methods for helping students master those subjects (Fernet, Guay, Senécal, & Austin, 2012), and increased investment in maintaining students' quality of learning (Roth, Assor, Kanat–Maymon, & Kaplan, 2007). Other teacher motivations which have been shown to impact powerfully on teaching again reflect the teacher's ability to engage, target, and strengthen these factors in their students (Firestone, 2014). Among others, these include intellectual curiosity, the need for genuine achievement, relational needs for affiliation, and the need for social support and approval (Butler, 2012). From a critical perspective there is no ideal set of motivations which all teachers should demonstrate throughout their years in the profession; However in combination, these are undoubtedly the hallmarks of a motivated and effective teacher (Pintrich, 2003).

2.3.1.2 Teacher self-efficacy

Another way of conceptualizing teacher motivation is to look at the effort expended by teachers to engage with and help their students' learn, the definitional tasks of teachers, through the construct of self-efficacy (Zee & Koomen, 2016). Social cognitive theory from which self-efficacy is derived, emphasizes the importance of agency through which individuals are able to make decisions about and exercise control over what they do (Bandura, 1982). Self-efficacy amounts to the situation specific evaluation one has in relation to one's job performance ability or occupational competence (Bandura, 2001). Teachers' self-efficacy beliefs, then, are the judgments they make about how effectively they are able to engage students and help them to learn (Bandura, 1977; Klassen, Tze, Betts, & Gordon, 2011). Studies of

teacher efficacy show that these beliefs relate to a range of teacher intentions and behaviors both inside and outside the classroom (Tschannen–Moran & Woolfolk Hoy, 2001; Wheatley, 2005): these judgments shape the behavior of teachers with regards to their commitment to their students and enthusiasm for the profession, their expenditure of effort in the classroom, their persistence in the face of adverse conditions, and how well they are able to weather setbacks (Skaalvik & Skaalvik, 2007, 2010).

There is a definite connection between teachers' evaluations of the congruence between their abilities and the needs of their students, on the one hand, and teachers' motivation to address those abilities and needs, on the other. Pre-service and early-career teachers tend to have a higher sense of teaching efficacy than mid-to-late career teachers do (Klassen & Tze, 2014; Tang, Cheng, & Cheng, 2014), likely because they have not faced the discrepancies which often occur between a potential teacher's anticipated experience of classroom processes and interactions and the reality of the experience. This discrepancy cannot be ignored because it has often been implicated in how teachers' motivations change as they progress through their careers (Remijan, 2014). Low self-efficacy, as well as feelings of inadequacy and incompetence can significantly contribute to the teacher demotivation (Skaalvik & Skaalvik, 2009). Previously committed teachers often disengage from their work due to self-efficacy doubts, and even when highly-experienced caring teachers do remain committed in situations where failure and disappointment are frequent, teachers may become apathetic, cynical or convinced of their inefficacy (Evans, 1997). With regard to efficacy and motivation, another player which emerges must be acknowledged: job satisfaction. Not only does self-efficacy contribute to one's perception of job

satisfaction, job satisfaction can also affect teachers' motivation (Collie, Shapka, & Perry, 2012; Klassen & Chiu, 2010). In studies on the impact of school organizational culture on motivation, teachers' perceptions of competence and job satisfaction were found to have a definitively positive impact on their motivation and performance (Arifin, 2015; Canrinus, Helms–Lorenz, Beijaard, Buitink, & Hofman, 2012; Shen, Leslie, Spybrook, & Ma, 2012).

In thinking about the specific application of the above notions and theories to language teaching, it is generally acknowledged that essential findings from mainstream teacher education are relevant and applicable for L2 teachers and L2 pedagogy (Dörnyei & Kubanyiova, 2014; Ellis, 2012). What emerges from the above examination of conceptualizations of teacher motivation thus far is that these theories account equally well for teacher motivation in the profession more broadly as they do for language teacher motivation. What research exists on teachers' motivation in L2 teaching contexts is focused on the ways in which teachers influence learners and their motivations through the materials and methodology that teachers use, the characteristics of the teachers themselves, and the ways in which the teachers interact with the learners (e.g., Cheng & Dörnyei, 2007; Cowie, 2011; Guilloteaux & Dörnyei, 2008; Kumazawa, 2013; Papi & Abdollazadeh, 2012; Maeng & Lee, 2015; Moodie & Feryok, 2015; Ruesch, Bown, & Dewey, 2012). Within the domain of second language teacher education, motivation has also been examined as a mediating factor for teacher behavior and decision making (Gao & Xu, 2014; Lamb & Wedell, 2015), receptiveness to change and innovative practice (Kubanyiova, 2009; 2012; Guilloteaux, 2013), professional development (Hiver, 2013; Kubanyiova, 2015)—

indicators are that teacher motivation is the common denominator in these and other desirable language teacher behaviors and dispositions.

One key principle that can be derived from the domain of language teacher motivation—and which appears to be particularly important in the L2 classroom—is the importance of teacher enthusiasm for the atmosphere of the language classroom and its impact on students' own motivation for learning (Dörnyei, 2001; Dörnyei & Murphey, 2003). It is at this point that teacher emotion intersects teacher motivation. Since motivation arises from internal tensions which are often associated with emotions, no discussion of language teacher motivation is complete without discussing practitioners' emotions (see also Shoaib, 2004). The flip side of this perspective is also accurate: cast in a certain light, language learners and their engagement, effort, and progress in L2 learning are an immediate influence—although certainly not the only one—on the motivation of L2 teachers (Mifsud, 2011; Wyatt, 2013; Xiao, 2014). This provides meaningful insight into the broader notion of how teacher and student motivation are connected and reciprocal in nature (Madni, Baker, Chow, Delacruz, & Griffin, 2015; Radel, Sarrazin, Legrain, & Wild, 2010). However, as with mainstream teacher motivation, there is a general dearth of work on language teacher motivation for its own sake, and a much more comprehensive program of research is required to combine theoretical insights and consolidate empirical findings from various geographical and language learning contexts.

2.3.2 Teacher emotion

Because emotions are an integral part of lived human experience (Lewis, Haviland-Jones, Barrett, 2008), they are ubiquitous, and this is especially the case in

environments where learners and teachers come together such as schools and classrooms (Benesch, 2012; Schutz & Pekrun, 2007). The majority of research revolving around emotions in the classroom has been directed at students' experiences, with considerably less attention focused on teachers as human beings, with their own affective experiences, their emotional lows and highs (Day & Lee, 2011; Schutz & Zembylas, 2009). The present section, however, provides a different perspective by focusing solely on teachers.

Scholars have recently proposed that teacher emotion is the product of cultural, social, and political relations (Dewaele, 2010; Frenzel, Goetz, Lüdtke, Pekrun, & Sutton, 2009; Zembylas, 2011). Conceptualized in this way, the role of others' expectations about how one should act and feel will influence one's emotions, and this impact cannot be ignored (Hargreaves, 2001). However, because teaching as a practice has long been regarded "primarily as a cognitive activity" (Zembylas, 2003a, p. 104), the concept of teacher emotion has only recently been recognized by scholars as being of central importance to teacher well-being, and professional practice. Emotions as sociocultural phenomena can be thought of as interpersonal in nature and in the way they are manifested; thus, they constitute a critical component of the teaching process (Shapiro, 2010). In other scholarly work, teacher emotion has been connected with the idea of teacher-self (O'Connor, 2008; Winograd, 2003), a construct composed of emotions, thoughts, and actions in a state of "constant construction, destruction and repair" (Zembylas, 2003b, p. 108). This line of theorizing posits that emotion plays a significant role in the development of the teacher-self, and that certain emotions are subject to emotional rules, which are often

sociocultural in nature. These rules undoubtedly emerge as external pressures, representing extrinsic factors that illustrate the intersection of motivation and emotion.

2.3.2.1 Positive teacher affectivity

Teaching, Palmer wrote, is a “daily exercise in vulnerability” (1998, p. 17). However, despite the adverse circumstances, a surprisingly large number of teachers not only avoid burning out but actually thrive in the profession (Day & Gu, 2014; Galton & MacBeath, 2008). This highlights a blind spot apparent in much of the teacher research literature of the last few decades (Bullough, 2011). Research ought to be as concerned with strength as with weakness; as concerned with building the best things in life as with repairing the worst (Seligman & Csikszentmihalyi, 2000). Fulfillment and thriving, of course, are much more than just the absence of negative affectivity (Frederickson, 1998, 2001). As Hargreaves has emphasized in his work, teaching offers many emotional rewards (Hargreaves, 1998, 2000, 2001) which are often overlooked in research on the inner life and minds of teachers. Indeed, positive emotions can be considered the most salient type of emotions experienced by teachers during teaching (Sutton & Wheatley, 2003).

One of the recurring themes in this literature regarding teachers’ positive emotionality is the topic of enjoyment and enthusiasm. *Enjoyment* can be seen as representing an internal, subjective teacher experience, while *enthusiasm* is the observable display of this affectivity which serves as the behavioral counterpart to enjoyment (Kunter, Frenzel, Nagy, Baumert, & Pekrun, 2011). Alexander, Grossnickle, and List (2014) have likewise explored the theoretical support for this notion of enthusiasm for teaching. Unlike motivation which arose as a phenomenon of

interest from empirical work with teachers and teaching, teacher enthusiasm emerged as “an amalgamation of existing models and theories”, among them self-determination theory, interest, flow, and expectancy-value theory (Alexander, Grossnickle, & List, 2014, p. 151). Enthusiasm is often cited as one of the core qualities of effective teachers’ instructional behaviors (Keller, Goetz, Woolfolk Hoy & Frenzel, 2016; Long & Woolfolk Hoy, 2006). This is why, from the perspective of positively influencing the learners they work with, a teacher’s “level of enthusiasm and commitment is one of the most important factors that can affect learners’ motivation to learn” (Dörnyei & Ushioda, 2011, p. 158). Teacher enthusiasm has also been connected to student’s learning outcomes through the lens of quality of instruction (Frenzel, Goetz, Lüdtke, Pekrun, & Sutton, 2009; Zembylas, 2007). Lamb and Wedell (2015) for instance have connected teacher enthusiasm with what they term “inspirational practice”, and propose that one’s love of teaching should not be dismissed in this context as it can have profound effects on learners and their resulting levels of enthusiasm.

Much like motivation, teachers’ emotions have a significant bearing on the quality of their classroom instruction, not to mention critical elements of their personal psychological well-being (Bullough, Bullough, & Mayes, 2006; Nias, 1996). In their review of a range of teacher emotional outcomes, Frenzel, Becker–Kurz, Pekrun, and Goetz (2015) discovered that positive emotions such as enjoyment played a stronger role in the classroom instruction equation than negative emotions such as teacher anxiety, but these and other scholars have also highlighted the significant difference in different teachers’ classroom practices depending on the subject and group of students being taught and how these combinations produced the

aforementioned emotions in the teacher (Becker, Goetz, Morger, & Ranellucci, 2014; Becker, Keller, Goetz, Frenzel, & Taxer, 2015). Emotions, like most other human experiences and behaviors, must therefore be seen as emerging dynamically from a complex of personal and situational factors (Lewis, Haviland–Jones, Barrett, 2008). The potential variability that arises from relative levels of students’ discipline, engagement, or academic performance has a bearing on teacher emotions, meaning these factors likely also impact teacher motivation (Frenzel, Becker–Kurz, Pekrun, & Goetz, 2015). This does not, of course, suggest a passive emotional role for teachers. Some authors suggest that the preferred response is for teachers to focus their emotional energy on what causes their emotions when teaching a particular subject or a particular group of students; this might include things such as designing classroom management strategies that tackle certain problems arising within a particular group of students. The idea behind this is to improve teachers’ emotional well-being in the real-time context of the classroom because this has the potential to improve teachers’ job satisfaction over longer time-scales (Frenzel, 2014).

Bang and Montgomery’s (2010) study of preferred teacher emotional types taps into this notion of the emotional energies of teachers. They explored the premise that teachers’ emotional energy is linked to their capacities to teach relative to their emotions, intensity, and passions as educators. Because they tend to work with and from the heart, educators with these preferred emotional profiles are altruistic and connect to students more closely (Bullough & Hall–Kenyon, 2011). Thus, they are able to “respond more deeply to gifted students’ needs, such as sensitivity, spirituality, intuition, and perfectionism” (Bang & Montgomery, 2010, p. 176). Given that such educators are also known for their strong motivations, this connection of positive

influence demonstrates that emotions and teaching practice intersect. There are also implications for the relationship between emotional energies and how teachers' construct a classroom climate conducive to learning (Darby, 2008; O'Connor, 2008), which are echoed in the findings of Becker et al. (2014; 2015) and Frenzel et al. (2009; 2015). The connection, more specifically applied to language teaching, can also be made between teacher emotion and student learning and emotion (Clarke, 2008; Stanley, 1999). For instance, Austin (2011) describes one teacher education program which offers the teacher-participants a chance to reflect on the emotional experience of their own language learning experiences in order to connect their own experiences with that of their students, and enable them to understand and engage their students more cogently (see also Trent, Gao, & Gu, 2014). These teachers describe and reflect on stages in their emotional development in the course of language acquisition, as well as their own motivations for second language acquisition, which adds to the intensity of the learning experience (Austin, 2011). Forging this connection between language learning and emotion can help teachers apply this form of inspirational impetus to their own language teaching to enhance their students' learning (Dörnyei & Kubanyiova, 2014).

Without emotional feedback from students, teachers would face the challenge of gauging their effectiveness intuitively (Boekaerts, 2007). Fortunately, teaching is a process that provides frequent performance feedback, which, among other things, has the potential to be emotional in nature (Chen, 2016). People—particularly teachers—can, and frequently do, learn from one another, often through observing the emotional reactions of others around them (Day & Lee, 2011). In this way, the emotional reactions of learners in classroom episodes are assessed by teachers and form the

basis for the future emotional responses which are etched into their teaching (Benesch, 2012; Schutz & Zembylas, 2009).

Several studies have, for instance, examined the role of emotional competence in teaching and acknowledged that it is critical in creating a positive classroom atmosphere and in maximizing students' learning (Chang & Davis, 2009; Merrell & Gueldner, 2010). Emotional competence includes emotional regulation, which is one's ability to exercise control over the intensity and duration of an emotional experience, as well as how the emotions are expressed (Gross, 1998; 2008). Given the emotional labor involved in teaching (Hochschild, 1983), teachers are likely to try to down-regulate or reduce the intensity, duration, and expression of their negative emotions; they will also tend to up-regulate or increase the intensity, duration, and expression of their positive emotions (Bono & Vey, 2005; Morris & Feldman, 1996). The emotional competence research suggests that, because learners' emotions have a direct impact on their relationship with their teachers, which in turn influences the learners' academic performance, it is necessary to understand the emotional interactions that occur between students and teachers (Chen, 2016; Jennings & Greenberg, 2009; Meyer & Turner, 2007; Sutton, 2007).

In their study of teachers' emotions in the classroom, Becker et al. (2015) used diaries to document teachers' and students' emotions and the relationship with learners' motivation. These authors posited a relationship between students' motivation, discipline, and prosocial behavior with the teachers' emotional competence (i.e., regulation) in the classroom. While other studies of teacher emotional regulation have focused mainly on enjoyment and anger, Garner (2010) highlights a range of other emotions such as frustration, disappointment, hope,

enthusiasm, and pride. She argues that, just as students, teachers can become distracted, bored, and emotionally overwhelmed by circumstances both within the classroom and outside its confines (Garner, 2010). What these and other findings suggest is that teachers' emotions depend significantly on the teachers' subjective evaluations of situations (i.e., their appraisals), suggesting that teachers ought to be capable of adjusting their emotions to the feedback from students (Gross & Thompson, 2007; Jiang, Vauras, Volet, & Wang, 2016; Sutton, 2004). The fact that student motivations have an impact on teacher emotions, as suggested by Becker et al. (2014, 2015), also suggests that the reverse is true: students' emotions may play a part in determining teachers' motivations. Further examining emotional regulation through a social lens, exposes social rules and expectations involved in the expression of emotions; teacher emotional regulation clearly has the potential to satisfy certain classroom norms and boundaries (Fischer & Manstead, 2008). Thus, because these function as external parameters on the ways in which teachers are able to express themselves or behave emotionally, the implication is that, emotional regulation will impact not only teaching practice, but also professional identity (Day, 2011).

Schutz and Lee (2014), confirming earlier work by other scholars (Zembylas, 2003a, 2003b), demonstrated that emotional competence has the potential to radically shape the development of teacher identity. However, there is a downside to this, as the lack of emotional regulation, often evidenced in emotional exhaustion and overload can also negatively impact teacher identity (Day & Qing, 2009; Goetz, Becker, Bieg, Keller, Frenzel, & Hall, 2015; Golombek & Doran, 2014). There is a general expectation for teachers to regulate or manage their own emotions while playing their professional classroom role (Zembylas, 2004). This illustrates that teacher identity is,

to a large extent, determined emotionally. Teachers are regularly required to show empathy or other positive emotions to students, even when those students' behavior is uncooperative, disruptive or even aggressive. Naturally, they are expected to do so even when they feel exhausted or are not in the mood for it (Geving, 2007; James, 2011). Furthermore, the picture emerging from work by mainstream psychologists is that emotion and cognition are fundamentally interdependent (Clore & Ortony, 2008; Storbeck & Clore, 2007), which would suggest that inside teachers' minds too, emotion and identity intersect and reciprocate both in initial processes of development and in ongoing regulation (Cross & Hong, 2009; Zembylas, 2007).

2.3.2.2 *Negative teacher affectivity*

Teaching is one of the most publically scrutinized professions (Gold & Roth, 2005). It is an occupation characterized by a heavy workload, low recognition, and emotionally demanding work – that may also be financially unrewarding (Kelchtermans, 2011; Kyriacou & Coulthard, 2000). In many countries the inability to retain teachers past the first few years of their career has become endemic, and ensuing teacher shortages are worsened by more experienced teachers opting out of the profession well before retirement age (Kieschke & Schaarschmidt, 2008). Even more pressing in the teaching workforce worldwide is the chronically reduced productivity of staff who are present at work but who are physically or mentally unwell, a phenomenon known as *presenteeism* (Gu & Day, 2007). Because of the immense emotional demands placed on educators, teaching is routinely reported as being one of the more stressful professions (Day, Sammons, Stobart, Kington, & Gu, 2007; Kyriacou, 2001; Kyriacou & Sutcliffe, 1977).

Researchers investigating occupational stress have described a model of stress defined in terms of the imbalance between the perceived demands from the environment and the individual's perceived resources to meet those demands (Hakanen, Bakker & Schaufeli, 2006; Lundberg, 2000). This demands–resources model also proposes that an imbalance may be caused by understimulation (Friesen & Sarros, 1989). Definitions of occupational stress have now converged around transactional or interactionist models which view stress as a constellation of events beginning with a stimulus (i.e., the stressor) that triggers a reaction in the brain (i.e., an appraisal) and then activates physiological response systems in the body (DeLongis & Preece, 2000; Hobfoll, 1989, 2001).

Teacher stress has been conceptualized and measured in parallel with these mainstream models (Fimian, 1984; Kyriacou & Sutcliffe, 1977), and Kyriacou (2001) defined teacher stress as “a negative emotional experience (...) triggered by the teacher's perception that their work situation constitute[s] a threat to their self-esteem or well-being” (p.27). Teacher stress has become widely researched in various teaching contexts throughout the world (Greenglass, 2000). Stress in the teaching profession has now been studied in relation to teacher commitment (Day, 2008), teacher identity (Beauchamp & Thomas, 2009), teacher morale and job satisfaction (Evans, 1997), teaching effectiveness (Borg & Riding, 1991), workplace turnover (Parker & Martin, 2009), job performance (Simbula, Panari, Guglielmi, & Fraccaroli, 2012), teacher well-being (Parker, Martin, Colmar, & Liem, 2012), and student attainment on tests (Ball, 2003). This body of work indicates that teacher stress is both a serious and wide-spread phenomena (Borg & Riding, 1991).

One aspect likely to trigger the perception of a threat to a teacher's well-being is the heavy workload intrinsic to teaching (Pithers & Soden, 1998). Teachers are often required to juggle multiple roles simultaneously, several of which may conflict with each other (Greenglass, 2000). The emotional demands of teaching (see earlier discussion of teachers' emotional regulation) are another recurring factor which takes a heavy toll on teachers' psychological and physical well-being. These demands regularly lead to emotional exhaustion, cynicism, and ultimately depersonalization (Maslach, 2001). An additional factor which exacerbates an already stressful occupation centers on lack of autonomy. The sense of control and agency that an individual possesses emerges as a central feature when attempting to determine what makes a situation more or less threatening (DeLongis & Preece, 2000). Greater autonomy and participation at work are commonly associated with higher levels of self-reported job satisfaction, commitment to work, better performance, as well as reduced levels of emotional distress (Day, 2008). Being excluded from the process of making decisions that directly impact teachers' workload and their quality of life has a substantially negative effect on teachers' sense of control and motivation (Parker & Martin, 2009). Teachers are also regularly confronted with a variety of measurements, comparisons, and performance targets (Day, 2008). This extreme element of monitoring and accountability is further distorted by changing demands and vague expectations that may accompany education reform, which have been shown to result in intensified anxiety and increased vulnerability (Ball, 2003; Bullough, 2005). If externally imposed reform mandates are appraised as a threat, they are likely to undermine commitment, encourage defensive teaching, stifle teacher autonomy, limit

reflective practice, and de-professionalize the field (Bullough & Hall–Kenyon, 2011; Gregoire, 2003; Kelchtermans, 2005).

Because defensive reactions encourage cognitive overload, stress has been shown to have detrimental effects on verbal reasoning, focus of attention, and complex task performance (Davies & Underwood, 2000). Additional studies have explored specifically how stress impacts individuals' effectiveness on tasks requiring avoidance of distractions, tolerance of frustration, and altruistic behavior such as sensitivity to others—major elements of a teacher's classroom role (Jepson & Forrest, 2006). Stress is also central to issues of teacher identity, self-esteem and psychological well-being, and the work performance and competence of teachers (Hakanen, Bakker, & Schaufeli, 2006; Maslach & Leiter, 2008; Woolfolk Hoy, 2008). Prolonged experiences of stress can reinforce teachers' feelings of incompetence, and this threat to self-worth can in turn result in a range of reactive teacher behaviors which emerge to protect conceptions of self and professional identity—including leaving the profession altogether (Ball, 2003; Parker, Martin, Colmar, & Liem, 2012). Conversely, studies into job attitudes and well-being in the workplace report that behaviors such as volunteering one's time and effort, cooperating with others despite discomfort to oneself, and listening and showing consideration for others' needs or desires correlate strongly with measures of job satisfaction (Judge & Kammeyer–Mueller, 2012).

Burnout, on the other hand, is a process of psychological erosion which results from an individual experiencing prolonged or cumulative chronic stress, usually in the context of one's profession (Maslach & Leiter, 2000). Three core components combine to make up burnout: exhaustion, cynicism, and inefficacy (Schaufeli,

Bakker, Hoogduin, Schaap, & Kladler, 2001). While, individuals in all occupations are at risk of burnout, those engaged in emotion labor are particularly susceptible (Brouwers & Tomic, 2000). Emotion labor is work that demands mental or physical effort in conjunction with a high degree of control over one's emotions (Hochschild, 1983). Several studies have reported significant relationships between the emotion work of teaching and burnout, as the former encourages the existence of the latter (Brouwers & Tomic, 2000; Näring, Briët, & Brouwers, 2006; Parker, Martin, Colmar, & Liem, 2012). Farber (2000) highlights some of the core factors at play in the prevalence of teacher burnout: a significant part of teaching involves interacting with emotionally needy students, exhibiting enthusiasm for subject matter and content which may not be of personal interest, responding calmly and confidently when confronted with disruptive student behavior, all while ensuring seamless progress in class. These combine over time, resulting in the high personal and organizational costs that are well-documented in the burnout literature (Greenglass, 2000).

The Maslach Burnout Inventory (MBI), a standardized instrument used to measure burnout in most empirical research, includes these three subscales reflecting the multidimensional nature of burnout (Maslach & Jackson, 1981). *Exhaustion* refers to feelings of chronic emotional or physical fatigue, a drain which comes from being overinvested in one's work. *Cynicism* refers to the negative, hostile, or distant response to others and to the work to be done. Because of this detached callousness, cynicism is often termed depersonalization. Finally, *inefficacy* refers to feelings of incompetence and a lack of achievement and productivity in work (Maslach & Leiter, 2008). Some research, though not all, sees burnout resulting from the absence of positive motivators. Positive motivators are features of a job such as organizational

support, autonomy, variety and significance which contribute to individuals' engagement and commitment to that job (Federici & Skaalvik, 2011). There is sufficient evidence to suggest that if work is unrewarding, unchallenging, and lacks sufficient feedback or recognition it may result in feelings of burnout (Friesen & Sarros, 1989). This supports the idea that causes other than those related to stress may be at work in many instances of burnout.

Emotional exhaustion is a significant predictor of the detrimental outcomes related to burnout (Skaalvik & Skaalvik, 2010). Hakanen et al. (2006), for example, discovered a negative correlation between the emotional exhaustion dimension on the one hand, and teachers' self-reported well-being and engagement on the other. Depersonalization is the dimension of burnout most commonly associated with undesirable job behaviors such as absenteeism, intention to quit the profession, and actual job attrition (Maslach & Leiter, 2008). Ultimately, a job may be emotionally draining and result in an individual experiencing emotional dissonance, but it is cynicism and depersonalization that reduces commitment to the job and satisfaction in the workplace (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001). Cynicism can negatively affect the ability of individuals engaged in emotion work to employ coping strategies under the strain of acute and chronic stressors (Zapf, Seifert, Schmutte, Mertini, & Holz, 2001). This element of detachment has also been shown to have a spillover effect on others, increasing conflict becoming "contagious" to other colleagues in the same organization (Maslach & Leiter, 2000, p. 359). Teachers often work in challenging circumstances with students who are apathetic, under intense pressure to increase student performance on tests, and have little autonomy in the workplace (Gold & Roth, 2005). Those who do not trust their abilities in these

circumstances, avoid responsibility, and project their negative attitudes onto the students can often exacerbate the negative effects for their students (Schaufeli, Bakker, & Salanova, 2006). Ultimately, these three dimensions of burnout work in concert and tend to mutually reinforce each other (Chan, 2003). For instance, an emotionally exhausted teacher is likely to become detached from the workplace and simultaneously experience a loss of perceived self-efficacy (Meister & Ahrens, 2011). Farber (2000), however, proposes that teacher burnout not be treated as a single phenomenon as it appears to be much more complex than is often assumed (Schaufeli & Greenglass, 2001).

Linking back to my earlier review of positive teacher affectivity, the converse of burnout is not a neutral state. Instead, the converse of burnout is the positive construct of engagement (Schaufeli & Bakker, 2004). *Engagement* with work is a productive and fulfilling state, defined in terms of the positive extremes of the three dimensions of burnout (Maslach, 2011). Seen from this perspective, engagement consists of a state of high energy rather than exhaustion, strong involvement rather than cynicism, and a sense of efficacy rather than inefficacy (Bakker, Schaufeli, Leiter, & Taris 2008). Most burnout scholars agree that engagement includes an energy dimension and an identification dimension. Thus, work engagement is characterized by a high level of energy and a strong identification with one's work (Maslach & Leiter, 2008). Teachers who are characterized by a strong sense of engagement with their work have an effective and energetic connection with their responsibilities at work. But when teacher burnout occurs, this energy turns into exhaustion, involvement into cynicism, and efficacy into ineffectiveness (Koeske & Koeske, 1989).

2.5 Conclusion

Although teaching itself is thought of by many to involve primarily cognitive aspects—with regards to conceptual knowledge, planning, decision making, and actual delivery (Borg, 2015; Burns, Freeman, & Edwards, 2015), in this section I have attempted to penetrate the surface and explore what lies at the roots of teacher cognition and behavior. Teaching is an inherently emotional profession, and as such involves constant development of self and identity (Palmer, 1998). The study of the psychology of the language teacher is a valid undertaking in its own right because it sheds light on why teachers are drawn to the profession, and why some may appear to be more successful than others in meeting the rigorous demands of the profession. Although each of the areas reviewed has, conventionally, been researched and theorized on their own, the reality is one of multiple simultaneous overlaps. Teacher motivation involves emotional appraisals and implicates notions of the self; teacher identity is a process of emotional development which can also be seen as a driving force for why teachers feel and act the ways they do; and, teacher emotion is the fire that burns, for better or worse, at the very heart of what it means to be a teacher. By examining a handful of underlying topics that pertain to language teacher psychology (i.e., teacher identity, teacher motivation, and teacher emotion), the picture that emerges is one of closely integrated cognitive, motivational, and emotional facets in the mind of the language teacher (Kubanyiova & Feryok, 2015).

3. The Anatomy of Immunity

3.1 Introduction

In this section I will explore the current understanding of shielding systems capable of safeguarding the individual, first from the biological domain and then from a psychological perspective. I begin with a brief overview of the physiological systems which permit the development of human immunity and the outcome of homeostasis. I then examine the two major maladaptive expressions of immunity—autoimmunity and allergy—before I relate this combined knowledge of immunity to stress. Throughout this first part of the current section, the concepts I will review may strike the reader as fairly technical, particularly with reference to the biological mechanisms that underlie innate and adaptive immunity, and may appear to be without much immediate connection to the field of applied linguistics. These are necessary, however, in order to build a sophisticated understanding of the metaphorical construct that I later link the findings of my research to in later chapters.

Having looked at the biological perspective, I will then turn to analyzing the parallels which the psychology literature might offer for this concept of a protective buffering system, particularly against the psychological and emotional threats that are a part of teachers' existence. I launch with a summary of what is known about coping techniques in this context. Following this, in reviewing the personality quality of hardiness, I examine the dimensions which are thought to make up the hardiness construct before outlining the mechanisms through which hardiness buffers against detrimental psychological outcomes, followed by a brief summary of other psychological constructs that overlap with or relate to hardiness. I round off this

chapter by looking at the psychological outcome of resilience, particularly how it has been operationalized in the literature, and then narrow my focus to look at how the phenomenon has been studied within teachers.

3.2 Biological Immunity

Immunity derives from the Latin *immunis* and refers to the condition of resistance against something (e.g., in the case of viral immunity) or exemption from something (e.g., as with diplomatic immunity, or judicial immunity) (Chiappelli & Liu, 2000). Across these various fields, immunity can be broadly defined as a defense system that protects the organism against the negative, undesirable or harmful impact of the external environment. The most familiar understanding of immunity is a biological one—often closely associated with the field of medicine—which specifies the system responsible for shielding the body from external attack and fighting off infection. The main function of the immune system is to minimize the impact of attacks from inside and outside the human body. The immune system does this by fighting off infection and by monitoring and destroying abnormal and malignant cells (Janeway, Travers, Walport, & Shlomchik, 2005). In his review of human immunity, Folds (2008) observes that the fundamental mechanisms leading to the development of immunity are not only highly complex as stand-alone systems, but are also interactive leading to an immense level of functional complexity. These two fundamental systems that act both simultaneously and separately in the development of immunity are the *innate system* and the *adaptive system* (Ligier & Sternberg, 2000).

3.2.1 Innate immunity

The innate immune response has been called the first line of defense against infectious pathogens (Janeway, Travers, Walport, & Shlomchik, 2005). The response of the innate immune system is rapid and non-specific, short in duration, and does not exhibit immunological memory—that is it does not require prior exposure to infection (Chiappelli & Liu, 2000). This all-purpose response involves a collection of protective mechanisms used to prevent or minimize infection. These consist of physical barriers such as skin and mucous membranes, antimicrobial secretions, and vascular system responses to infectious encounters (Finlay & McFadden, 2006). In combination, these function as a considerable protective measure against invading pathogens by refracting most encounters with bacteria.

Instances where the natural physical barrier of the skin is penetrated slightly will activate and trigger antimicrobial peptides called *defensins* which disrupt bacterial cell membrane fidelity and prevent skin infections (Janeway & Medzhitov, 2002). Activated proteins result in a biochemical reaction of *opsonization*—the marking and targeting of a pathogen for removal—and ends in *lysis*, the targeted destruction of invading cells or microbes (Orange, 2008). The additional release of histamines—local immune response compounds—increases blood flow and ultimately reduces the risk of immediate injury or infection (Imler & Hoffman, 2001). This rapid response built-in barrier is reinforced by a complement system, a cascade of biochemical reactions which when activated is a crucial part of the innate immune response (Finlay & McFadden, 2006). These include among other things immunoglobulins, natural antibodies that intercept antigens; toll-like receptors, which

detect a breach in the body's defense barriers; and, the aptly named natural killer cells that recognize malignant cells and destroy them (Giclas, 2008).

3.2.2 Adaptive immunity

The adaptive immune response is sometimes called *acquired* immunity, precisely because it is rarely built-in to the host. It exhibits immunological memory, and has much greater specificity than its innate counterpart. These features of adaptive immunity are what distinguish it from innate immunity (Chiappelli & Liu, 2000):

- memory: the use of past experiences to formulate responses that become more rapid and powerful on subsequent exposures to pathogens;
- specificity: the ability to recognize, distinguish, and respond appropriately and individually;
- durability: weak or non-existent at the outset of exposure to viruses, it gradually develops into a robust and long-term protection against subsequent exposures to that pathogen.

Some of the most central components of acquired immunity are white blood cells called T- and B-*lymphocytes* that have antigen-specific receptors on their surface that are able to recognize microbes and provide rapid and targeted responses to later encounters with the same microbes (Cooper & Alder, 2006). Antibodies, such as the IgM, IgG, IgD, IgA, and IgE *immunoglobulins*, are another crucial part of the adaptive immune response (Pancer & Cooper, 2006). They recognize the structure of viruses and react with differentiated responses that maximize the specificity with which they can eradicate the invading microbes (Ligier & Sternberg, 2000). Adaptive

immunity occurs locally and system-wide so as to defend the host, heal and repair the tissue and cells of the host, and restore *homeostasis*—the stable functioning of the living organism (Folds, 2008). This targeted response which occurs through the concerted action of a range of components is evidence of the powerful link between the nervous system and the immune system (Felton & Maida, 2000).

3.2.3 Survival and physiological self-regulation

Homeostasis refers to the combined psychological and biological processes of self-regulation that return or maintain systems in an organism (e.g., body temperature, blood pH levels, oxygenation) to critical limits that allow it to survive (Schulkin, 2003). Homeostasis also covers a range of defensive mechanisms that ensure protection from otherwise harmful experiences. These physiological mechanisms automatically allow the central nervous system to allocate minimal attention to details of day-to-day survival and instead to focus on higher order functioning (Goldstein, 1995). While it has been of some use to the medical research community, the term homeostasis has been associated the notion of a static concept or a closed system. In fact, the human body is an open system that possesses considerable plasticity, and its self-regulatory systems constantly adapt in response to the changing environment (McEwen & Wingfield, 2010). To address this concern, some have adopted the term *allostasis*—a term meaning stable (*stasis*) variation (*allo*)—to emphasize the biological phenomenon of stability through change (Schulkin, 2003). The concept of allostasis, widely adopted in research on stress and regulatory physiology, proposes that defensive self-regulatory systems are present but anticipate and adapt as required, rather than simply react (Schulkin, 2011). The sustained activation of allostatic

mechanisms results in the *allostatic load*—the wear and tear on the brain and body of adapting to physiological and psychological challenges.

3.2.4 Counterproductive immunity

Immunity's primary function is protective, and because of this a compromised immune response (i.e., when a person displays immunodeficiency) can lead to heightened susceptibility to disease (Pancer & Cooper, 2006). Conversely, however, a hyperactive immune response can result in the human body itself being the subject of an attack, the outcome of which is a range of autoimmune and inflammatory diseases (Chiappelli & Hodgson, 2000). Hyperactive immune responses, among others, include *allergic* reactions to harmless foreign particles and *autoimmune* reactions which reject new material, internal or external to the body, that the body needs to heal itself or to thrive, thus threatening the survival of the host (Chiappelli & Liu, 2000). The imbalance in regulatory components of immunity can initiate an immune response that either does not recognize essential healthy tissue and thus begins to attack it (i.e., an autoimmune response), or that is an excessively robust response to benign stimuli (i.e., an allergic response) (Kay, 2000).

Tolerance is the immune process by which the ability of lymphocytes to react to the host's own tissue (i.e., self-antigens) is impaired or eliminated (Alarcón–Riquelme, 2005). Ordinarily, tolerance corrects for (a) hypersensitive or overly aggressive immune responses that overtax an immune system or (b) that are directed against the self (Rose, 2008). Autoimmunity, for instance, is initiated when autoreactive antibodies are not removed from the blood system through tolerization (Edwards, Cambridge, & Abrahams, 1999); allergy, on the other hand, originates with

IgE antibodies binding to an innocuous allergen triggering the release of inflammatory histamines. Maladaptive expressions of human immunity such as anaphylaxis to nuts or dairy products, or tissue rejection in the case of an implanted foreign organ, can have a detrimental effect on the well-being of the entire system, by causing physiological abnormalities and disease, or even be fatal (Rabin, 2000). A harmful immune response can result in both local and system-wide diseases with the potential to affect virtually any organ or tissue in the body.

3.2.5 The interface between the brain and human immunity

Psychoneuroimmunology is the study of the interface between the brain, behavior, and human immunity (Maier, Watkins, & Fleshner, 1994). Over the past 40 years, more than 300 studies have been conducted on the interface between stress, emotions, and human immunity (Segerstrom & Miller, 2004), and taken together these studies provide evidence that the negative emotions that accompany stress and burnout can “get inside the body” (p. 604) and radically alter immune regulation by being immunosuppressive. Extreme psychological stress has a cumulative impact on the body, conceptualized by some as the psychobiological allostatic load (Charney, 2004). This burden on the brain and body can increase susceptibility to infection by overtaxing the adaptive immune response and even exacerbate autoimmune diseases (Denson, Spanovic, & Miller, 2009). In their review, Segerstrom and Miller (2004) conclude that stress may simultaneously enhance and suppress immunity. These diverse findings illustrate the complex nature of the relationship between psycho-affective factors (i.e., those which accompany stress and burnout) and immune functioning.

3.3 Psychological Parallels to Immunity

In the first sentence of his best-seller *Authentic Happiness* Martin Seligman wrote that “for the last half century psychology has been consumed with a single topic only—mental illness” (2004, p. 1). This was certainly hard to dispute, in light of the fact that the number of published works on negative states at the time exceeded those on positive states by a ratio of 14:1 (Schaufeli & Salanova, 2007). Only with the positive turn in psychology—circa the turn of the millennium—did the field of psychology see a renewed focus on positive aspects of human mental processes (Seligman & Csikszentmihalyi, 2000). Since then, however, this positive branch has contributed literally hundreds of thousands of studies to the psychology literature now replete with models and theories related to constructive explanatory styles and mindsets, positive emotionality and states of awareness, beliefs about self and personhood, and faith, hopes, and goals for the future (Carver & Scheier, 1998; Csikszentmihalyi & LeFevre, 1989; Dweck & Leggett, 1988; Frederickson, 2001; Langer & Moldoveanu, 2000; Myers, 2000; Peterson, 1991, 2000; Snyder, 2000; Snyder & Higgins, 1997).

Because enhancing the psychological well-being of individuals is now a prominent concern of the field of psychology, it may be helpful to explore the existence of psychological parallels to biological immunity. Below I examine three relevant constructs with at least some parallels to immunity: *coping*, techniques that are thought to counteract or remedy stressors (Somerfield & McCrae, 2000); *hardiness*, a personality disposition which is thought to buffer the psycho-affective effects of stress on performance (Maddi, 2004); and *resilience*, the capacity to recover

from experiences of psychological adversity or maintain effective functioning despite traumatic circumstances (Masten, 2001). These concepts have featured in mainstream educational psychology research, but to-date there has been limited crossover to the applied linguistics literature or to language teacher research.

3.3.1 Coping

A substantial body of literature has established how coping behaviors affect individuals' psychological and emotional well-being in the face of stress (Somerfield & McCrae, 2000). Coping behaviors underlie many constructs in positive psychology and have been categorized in several ways. In the most common distinction *direct action techniques* (also known as “problem-focused coping”) have been contrasted with *palliative techniques* (also known as “emotional-focused coping”) (Kyriacou, 2001). Problem-focused coping involves taking direct action to remedy a situation or eliminate a source of stress, while emotional-focused coping is aimed at changing how a situation is appraised in order to reduce the feelings of stress (DeLongis & Preece, 2000).

Partly a symptom of one's emotions, psychological stress is an intrinsic part of contemporary life, and teachers in particular have been identified as among the most vulnerable individuals in any workplace (Helsing, 2007). However, the fact that large numbers of teachers do remain within the profession suggests that dealing successfully with stressors contributes to their survival. Through the adaptational efforts of coping, some individuals are able to tolerate traumatic events with only temporary or minor disturbances, while those unable to cope experience a severe and detrimental impact when exposed to the same events (Rahe, 2000). Among the more

prominent coping factors teachers call on are (a) having a sense of social support, (b) feeling in control of their circumstances, and (c) having a high level of self-esteem and optimism (Griffin, Steptoe, & Cropley, 1999).

Social support is generally considered to moderate workplace stress or to serve as a buffer against health risks under stressful conditions. It is defined by factors such as having close social ties and someone to share emotional experiences with, good collaboration with colleagues and superiors, the possibility of getting help when needed, and adequate feedback about one's effort and performance (Lundberg, 2000). Research into teachers' coping behaviors has also highlighted the value of building social support in to the school environment through, among other things, having good communication between staff and management, clearly defining roles and expectations, minimizing bureaucracy and paperwork, providing resources and facilities to support teachers, and consulting each other to solve problems when they arise (Kyriacou, 2001; Russell, Altmaier, & Van Velzen, 1987).

Control over stressors can be defined as having a behavioral response at one's disposal "that can prevent, reduce, or terminate stressful stimulation" (Steptoe, 2000, p. 526). Studies of this coping response suggest that perceived control is the result of a subjective judgment, based on an individual's appraisal of the situation. How a situation is evaluated, or appraised, determines the degree of stress experienced by the individual (Griffin, Steptoe, & Cropley, 1999). Appraisal has two elements: in primary appraisal the situation is assessed as being stressful or not, as well as being controllable or not; secondary appraisal involves a consideration of the correct course of action to take (Davies & Underwood, 2000). Both primary and secondary

appraisals are automatic processes and tend to occur simultaneously, and this is why individuals are rarely conscious of their occurrence (DeLongis & Preece, 2000).

Some aspects of personality such as self-esteem, optimism, type-A behavior, extraversion and neuroticism, have been shown to play a significant role in how individuals deal with stress (Somerfield & McCrae, 2000). Self-esteem, the particular way an individual's self-perceptions of their ability to successfully deal with setbacks and challenges in the course of their teaching and retain their level of engagement, has been found to buffer against anxiety and depression, and to mediate the effects of stress in teachers (Parker & Martin, 2009). Low self-esteem is associated with such undesirable behaviors as hostile competitiveness and emotional rumination used to compensate for feelings resulting from low self-esteem (Hargreaves, 1998). There is also robust evidence for high self-esteem serving as a protective buffer against the impact of a wide range of lower-order stress factors (Roger, 2000).

Studies into workplace coping behaviors also show that individuals employ an additional domain of coping techniques characterized by a variety of psychological defense mechanisms (Blanchard, Hebert, & Blanchard, 2000). For some coping theorists, defensive mechanisms are unconscious and unintentional, and serve as a first line of defense to mitigate the impact of stressors (James, 2011). Defense-related behaviors occur in the context of a threat stimulus (Sedikides, 2012), and these mechanisms act as a filter through which the individual's perception of the significance of the events experienced can be altered. These include things such as repression, denial and displacement, self-handicapping, and making external attributions. Perhaps, not surprisingly, these mechanisms have been documented in teaching as well (Ehrman & Dörnyei, 1998; Olsen & Sexton, 2009). Defense

mechanisms are importantly distinct from other coping behavior: they may be beneficial in avoiding a stressor in the short-term, but are insufficient for long-term adaptation to stress and thus often become maladaptive (Roger, 2000).

3.3.2 Hardiness

A complementary body of research has also identified a psychosocial construct which moderates the impact of stress and burnout on people in a range of professions. This is the personality attribute of *hardiness* (Kobasa, 1979; Maddi, 2013). Existential psychologists noted early on that many subjects they observed with high levels of stress did not follow the more traditional pattern of also suffering from physical or mental illness. Instead these highly-stressed individuals remained healthy, prompting Suzanne Kobasa and Salvatore Maddi to propose the existence of a personality disposition on a continuous dimension that they termed hardiness (Kobasa, Maddi, & Courington, 1981). Following its introduction, the construct of hardiness generated considerable interest within the psychological and health sciences literature (Allred & Smith, 1989). There is now a substantial and varied body of research investigating hardiness in a wide range of subject groups including military personnel, teachers, attorneys, mid-level managers, health care professionals, human services workers, law enforcement officers, single parents, secondary and tertiary students, immigrants, athletes, nursing mothers, expatriates, and the elderly (see e.g., Funk, 1992; Maddi, 1999b).

The hardy personality type is a constellation of three Cs—sub-domains that function as a resistance mechanism to stressful life events (Maddi, 1999a). These are *commitment*, *control*, and *challenge* (Kobasa, 1982). A hardy person has a general

purpose and sense of meaning in life which allows them to approach potentially stressful situations with the belief that they are meaningful and interesting, and this signifies commitment rather than its converse of alienation. Hardy people also feel and act as if they can influence life events, and thus see stressors as changeable reflecting the aspect of control over powerlessness. Finally, they see change as a normal aspect of life rather than as a threat, and view this change as an opportunity for growth and development (i.e., a challenge) rather than a threat. In brief, hardy individuals are able to remain physically and mentally healthy despite stressful lives by neutralizing the debilitating effects of stress and burnout (Kobasa, Maddi, & Kahn, 1982).

3.3.2.1 Issues in hardiness research

The question of construct distinctness has been explored by researchers who noted similarities between hardiness and other psychological constructs. Scholars have taken a comparative analytic stance by empirically evaluating the relative effectiveness of hardiness and other positive factors to predict specific, conceptually relevant, dependent variables (Maddi et al., 2006).

Hardiness and Optimism

Hardiness and optimism are both dispositions believed to have important consequences for the way individuals interact with their environment and with life events they encounter (Maddi & Hightower, 1999; Peterson, 2000). The commonality these two constructs share relates to coping: researchers of optimism (Scheier & Carver, 1985; Scheier, Weintraub, & Carver, 1986) and hardiness (Kobasa, Maddi, &

Zola, 1983; Maddi, 2004) both maintain that their trait encourages effective coping in the face of stressful experiences. Whereas, conceptually hardiness is derived from existential psychology, the dispositional trait of optimism originates from a social cognitive perspective (Maddi, Harvey, Khoshaba, Fazel, & Resurreccion, 2012). Beginning with their model of behavioral self-regulation, Scheier and Carver (1985) conceived of optimism as a broad expectation for successful outcomes expressed through an individual's goal-oriented, effortful striving despite the disruption of stressors. Those low in optimism will have negative expectations regarding outcomes and their coping behavior will be characterized by passiveness and disengagement from goal-oriented efforts (Scheier, Carver, & Bridges, 1994). The control dimension of hardiness is similar to the assumptions of optimism—namely that behavioral reactions to stressful events should be designed to influence outcomes and decrease feelings of powerlessness. In contrast, the commitment and challenge dimensions are more specific to hardiness. Hardiness adds to optimism's expectations of positive outcomes and the control to participate in them by emphasizing the aspects of involvement and interaction with the world and with lived experience (Maddi & Hightower, 1999).

Hardiness and Sense of Coherence

In his work in medical sociology, Aaron Antonovsky observed that a surprisingly large band of people maintain favorable health despite their exposure to potentially disabling stress factors (1987). While theorizing about the ways in which individuals survive, adapt, and overcome given the ubiquity of life stressors, Antonovsky proposed that a fundamental sense of purpose, what he termed a *sense of*

coherence, is the most essential and encompassing stress-resistance resource (Kobasa, Maddi, & Kahn, 1982). This sense of coherence allows for optimal performance in the face of stress and is composed of three factors: a sense of comprehensibility, the belief that events make sense and are predictable; a sense of manageability, the belief that events can be handled with the resources available; a sense of meaningfulness, the belief that events are interesting and worth experiencing and caring about (Maddi, Khoshaba, Harvey, Fazel, & Resurreccion, 2011). Antonovsky proposed that people make sense of and manage events in life through generalized resistance resources—any coping resource effective for combating psychosocial stressors (1979). Furthermore, he believed that the third factor was the most crucial, because if a person believes there is no reason to persist and confront challenges (i.e., if the individual lacks meaningfulness) they will have no motivation to comprehend and manage events (Antonovsky, 1987). While there appears to be some overlap between these constructs, the challenge aspect is the biggest difference between the two. Hardiness highlights change whereas sense of coherence emphasizes stability. Additionally, their areas of application have not converged: hardiness was prominent in the field of psychology, while the sense-of-coherence construct exists primarily within the sociology literature.

Hardiness and Self-efficacy

With its origins in social cognitive theory, self-efficacy was first proposed by psychologist Albert Bandura as a way to conceptualize an individual's future-oriented beliefs in their ability to succeed or cope in specific situations (1977). This judgment about a person's capacity to bring about desired outcomes is, in essence, a belief

about the level of competence a person expects to bring to bear on a given situation (Bandura, 2001). Self-efficacy has been theorized as influencing the cognitions and emotions that drive behavior (Bandura, 1993). Particularly in the context of stressful experiences and aversive life events, these personal efficacy beliefs are thought to determine whether coping behavior will be initiated, how much effort will be expended, and how long it will be sustained (Bandura, 1977). In brief, an individual's expectation that they have what it takes to accomplish a challenging task will allow them to expend more effort through goal-oriented behavior, persist even when encountering obstacles, bounce back from temporary setbacks, and exercise control over life events (Bandura, 1997).

With regards to the specific impact self-efficacy has on cognitive and motivational processes, individuals with lower levels of self-efficacy may regard stressful events or challenging tasks as more threatening than they really are, and attribute failure to a lack of ability (Bandura, 2001). Unlike high self-efficacy individuals, who will attribute their lack of success to external factors and increase their effort expenditure and persistence in the face of setbacks, those with low self-efficacy will become discouraged and give up (Bandura, 1982). Empirical studies of hardiness have made connections, whether implicitly or explicitly, between the self-efficacy and hardiness constructs (Maddi, Harvey, Khoshaba, Fazel, & Resurreccion, 2009). Some researchers have argued that hardiness instruments in fact measure the construct of neuroticism (Funk, 1992; Funk & Houston, 1987), and others working outside this domain have established the very close relationship between neuroticism and self-efficacy, even arguing that the concepts of neuroticism and self-efficacy measure the same, single factor (Judge, Erez, Bono, & Thoresen, 2002). Because of

this, it is still unclear whether hardiness differs significantly from self-efficacy, and how (Carver, 1989).

Hardiness and Neuroticism

The Big Five personality traits are five broad dimensions used to describe and study human personality (John, Naumann, & Soto, 2008). These are openness, conscientiousness, extraversion, agreeableness, and neuroticism (McCrae & Costa, 2008). Beginning early on in the hardiness research, there were concerns that the negatively keyed hardiness scales inadvertently measured the construct of neuroticism (Funk & Houston, 1987; Rhodewalt & Zone, 1989). Neuroticism is a personality trait characterized by the tendency to feel anxiety, moodiness and depression, and low self-esteem (Costa & McCrae, 1985). Individuals high in neuroticism cope poorly with stress and show tendencies for irrational thinking and poor impulse control (Allred & Smith, 1989). Neuroticism has also been found to be a strong predictor of tolerance for emotional disturbances (Costa & McCrae, 1987). Individuals who score low in neuroticism display greater calmness of demeanor, and they are less emotionally excitable and reactive to stress. These low-neuroticism people tend to be calm, even-tempered, and less likely to feel rattled or threatened (Saulsman & Page, 2004). Research findings consistently indicate that elevated neuroticism is related to intolerance for stress or aversive emotional stimuli, and is associated with a range of mood, anxiety, personality, and eating disorders (McCrae, 1990). Because of this, Funk (1992) argues that the absence of neuroticism should be seen as an outcome of adjustment or emotional stability in the face of stress—essentially what hardiness is. The first decades of hardiness research, marked by the use of negatively keyed scales,

may have actually measured maladjustment or alienation (Funk & Houston, 1987). However, even after measurement scales were revised, moderate correlations were discovered between hardiness and trait anxiety (Allred & Smith, 1989) leading some to call for all subsequent empirical hardiness research to control for negative affectivity, depression, or neuroticism to avoid confounding hardiness results with measurements of other complementary psychological constructs (Funk, 1992).

3.3.2.2 *Hardiness mechanisms*

One of the main challenges of summarizing the usefulness of hardiness research is due to the variance in measurement instruments. The variety of hardiness scales in use not only makes interpreting existing findings a highly subjective task, it also raises questions as to whether variations in outcomes across studies are real or merely reflect differences in the hardiness scales used in respective studies. To further complicate matters, while factor analyses of the items have generally formed factors consistent with the theoretical conceptualization of hardiness, it has at times produced factor loadings on anywhere from one to four conceptual dimensions, leading some to choose to combine the dimensions into a unitary construct rather than treat hardiness as a multidimensional construct.

Partly because of these methodological issues, hardiness research has been criticized for its lack systematicity in determining the causal means by which hardiness buffers against stress. However, a number of studies suggest that hardiness buffers the detrimental effects of stress on health and performance through a handful of moderating mechanisms across a range of demographics (Wiebe, 1991). The most widely cited (Maddi, 1999a) of these are (a) cognitive appraisal, (b) transformational

coping, and (c) robust physiological immune responses. Maddi (1999b) proposes that these mechanisms are interactive whereby they feed off of each other and increase in magnitude until the problem is resolved.

One the most fundamental ways hardiness is hypothesized to reduce stress is through cognitive appraisal (Kobasa, 1979). The cognitive appraisals of a hardy individual reframe their perceptions of events and thereby make those events less stressful for the person. In their study of coping behaviors related with the personality construct of hardiness, Rhodewalt and Augustsdottir (1984) discovered that high-hardy individuals were more likely than low-hardy subjects to view life events as positive and controllable, and to see a sense of challenge in them rather than an imminent threat. Other studies discovered that subjects with an unhealthy attributional style and who made more negative self-statements in response to a perceived threat reported lower control and commitment than other subjects (Allred & Smith, 1989). Structural equation models also indicate that the increased positive affect, along with the decreased negative affect, of high-hardy individuals mediates the pathway between hardiness and self-reported health outcomes (Rhodewalt & Zone, 1989). Because of their adaptive stress appraisals which tend to reduce the stressfulness of events or experiences, high-hardy subjects have also been shown to exhibit increased frustration tolerance in tasks that demanded concentration and persistence (Wiebe, 1991). It is generally argued that the stress-appraisal style correlated with high hardiness results in decreased sympathetic arousal to stressful stimuli, which in turn reduces the long-term health consequences of stress (Maddi, 2004).

Coping, particularly the presence or absence of specific approach and avoidance coping strategies, has also received considerable attention as a mechanism

by which hardiness moderates the detrimental effects of stress on health outcomes (Vogt, Rizvi, Shipherd, & Resick, 2008). Approach and avoidance refer to cognitive, emotional, and behavioral activity that orients the individual either toward or away from a perceived challenge or threat (Suls & Fletcher, 1985). In contrast to others, hardy individuals are able to adapt or modify their behavior once stress is perceived or experienced. Several studies suggest that, unlike subjects low in hardiness, high-hardy individuals engage in adaptive coping strategies involving the transformation of stressful situations into more positive experiences (Maddi & Hightower, 1999; Williams, Wiebe, & Smith, 1992). Hardiness has also been found to have a significant correlation with problem-focused and support-seeking coping (Nowack, 1989). Regressive coping strategies, however, are typically used by subjects low in hardiness to reduce the interaction with the stressful event because they feel powerless and threatened when they encounter external forces of change that disrupt their natural stability (Maddi, 1999a). These include avoidance-oriented behaviors (which relate to my review of defensive coping strategies from the coping literature) such as denying that stressful events occurred, the tendency to blame oneself for the threat of events, and self-isolation to avoid change or taking responsibility. These strategies are termed regressive because they do nothing to terminate or transform the stressful event and its consequences (Maddi, Harvey, Khoshaba, Fazel, & Resurreccion, 2009). High-hardy persons, in contrast, become invested in stressful events they encounter, believe they can transform or influence their outcome, and expect that change will be accompanied by growth or development. Thus, unlike their low-hardy counterparts, they are driven to increase their interaction with stressful events in order to explore, learn from, and influence these (Ganellen & Blaney, 1984).

While the bio-physiological mechanisms that mediate hardiness and outcomes of psychological vulnerability are still not fully understood (Roth, Wiebe, Fillingim, & Shay, 1989), the physiological immune responses correlated with hardiness are very much connected to the decreased sympathetic arousal to stressful stimuli that high-hardy individuals show. Studies have indeed reported more robust immune system responses in people with high hardiness (Dolbier et al., 2001), while other experiments have found an association between higher levels of adrenal-pituitary hormones and high hardiness (Zorrilla, Derubeis, & Redei, 1995). In a recent study comparing participants with unbalanced hardiness profiles with those in a high-hardy group, Sandvik et al. (2013) found that when exposed to unexpected stressful or threatening events, subjects with an unbalanced hardiness profile showed more unhealthy immune and neuroendocrine responses, unlike the balanced and high-hardiness individuals. These findings suggest that individuals high in hardiness have a more adaptive, and consequently more successful, immune stress response.

3.3.3 Resilience

Resilience provides what is perhaps the most comprehensive picture in psychology of individual qualities that enable an individual to survive and function effectively despite extreme hardship and risk. The consensus in most current theorizing is that the development of this self-righting capacity is the result of fundamental systems for human development and adaptation operating normally, and that it may be found in every human to varying degrees at varying times in one's life span (Kelley, 2005; Reich, Zautra, & Hall, 2010).

The foundations of resilience research were set in the 1970s and 80s when a group of developmental psychologists studying the origins of mental illness and behavioral problems were surprised to find that many children who appeared to be at risk for psychopathology due to genetic or experiential factors were in fact developing well (Chicchetti, 1984; Garmezy, 1971; Garmezy, Masten, & Tellegen, 1984). Studies done with samples of children in extreme poverty or with mentally unhealthy parents, children raised in foster homes and other institutional settings, children of criminal or abusive parents, and children of the Holocaust grown to adulthood consistently showed that even in the face of severe threats or significant hazards to their development these children exposed to deprivation possessed protective factors that provided a form of invulnerability to extreme stressors (Werner, 1993, 1995).

These discoveries in the newly prominent field of developmental psychology led researchers to refocus their attention toward positive human capabilities and adaptive systems that promote healthy functioning and away from deficit-focused models of childhood development (Lipsitt & Demick, 2012). From the early 1990s onward, resilience research expanded from its focus on the phenomenological descriptions of resilient qualities and protective factors to the process of how individuals acquire or develop these resilient qualities which allow them to cope with adversity, change, or loss (Zabarenko, 2000). By moving rapidly into fields other than psychology since the turn of the century, resilience research has become multidisciplinary (Van der Werff, Van den Berg, Pannekoek, Elzinga, & Van der Wee, 2013), and there is now also a growing body of research investigating resilience in educational settings (Esquivel, Doll, & Oades–Sese, 2011).

3.3.3.1 Characteristics of resilience

Resilience as a Quality

Early attempts to define and operationalize resilience saw this phenomenon as the capacity to achieve an outcome of effective functioning, despite challenging or threatening circumstances and adversity (Masten, Best, & Garmezy, 1990). Two slight, albeit complementary, distinctions to this definition of resilience-as-quality are (a) in the capacity for individuals to maintain a positive outcome despite the occurrence of traumatic experiences (Luthar, Chicchetti, & Becker, 2000), and (b) in the ability of individuals to bounce back or recover from a traumatic experience (Zautra, Hall, & Murray, 2008)—essentially a distinction between sustainability and recovery.

There are two major dimensions to this operational definition. The first concerns the existence of a threat or a risk: individuals are not thought of as resilient unless they have encountered a significant risk or threat. Ann Masten (2001) calls this half of the resilience equation “demonstrable risk” (p. 228). Much of psychology research prior to the discovery of resilience specifies risk factors—ranging from socio-economic status, exposure to maltreatment, violence and abuse, to community trauma—and cumulative stressful life events that are significant predictors of a spectrum of undesirable outcomes or developmental problems (Chicchetti & Garmezy, 1993). The other dimension is the positive adaptation aspect, whereby an outcome is judged on certain criteria to be desirable, effective, or positive. Several researchers have used the criterion of achievement of the major societal expectations for the behavior of people in a certain role or social situation (Egeland, Carlson, & Sroufe, 1993). Others have considered the absence of psychopathology, undesirable

symptoms, or impairment as the criterion for resilience. Still others have included both, specifying the nature of their developmental criteria as being either external (e.g., the absence of substance abuse or delinquency) or internal (e.g., psychological well-being) (Luthar, Chicchetti, & Becker, 2000).

The body of resilience research which drew on this operationalization was concerned with discovering the characteristics which differentiated those who thrive in the face of substantial risk and adversity from those who succumb to destructive forces (Lipsitt & Demick, 2012). Its agenda was to describe the qualities which help people function effectively despite high-risk circumstances (Masten, Best, & Garmezy, 1990). Factors from which resilience appear to be derived concern (a) attributes of the resilient individuals themselves, (b) aspects of their relationships with significant others, and (c) characteristics of their wider social-cultural environments (Garmezy, Masten, & Tellegen, 1984). Masten (2009) and Wu et al. (2013) outline the factors found in much of the first two decades of resilience research.

The individuals themselves:

- have positive self-perceptions and are optimistic;
- possess the self-regulation skills needed to be autonomous and goal-oriented;
- are altruistic, and possess a sense of meaning in life; and,
- have high self-efficacy and use active coping strategies.

Factors which relate to their relationships with others include:

- having positive relationships with others who are nurturing and competent;
- seeking out friends and partners who are supportive; and,
- using the attachment of social support networks throughout one's life.

Their socio-cultural environments are characterized by:

- close bonds to effective institutions and other prosocial organizations;
- tightly-knit communities with positive services and support mechanisms; and,
- cultures that provide positive standards, rituals, relationships, and support.

Resilience as a Developmental Process

In the second-wave of resilience research (Richardson, 2002) researchers began to view resilience in terms of a dynamic developmental process involving the interaction of genetic, neuro-biological, psychological, and sociological factors in a given environment (Chicchetti, 2010). An individual actively participates in this developmental process across time, with prior experiences and interactions shaping the organization of this process of protective functioning (Bonanno, 2004). Within this framework, resilience is seen as the process of using internal and external resources to successfully resolve or adapt to risks and threats. This perspective is more inclusive as it proposes multiple pathways to resilience, as well as the potential for disordered outcomes or maladjustment.

There are clear implications for prevention and intervention from this developmental perspective: identifying the factors that foster resilience is crucial, but approaching resilience as an underlying protective process allows researchers to study exactly how and why some individuals do achieve this outcome of effective functioning despite traumatic events (Masten, Best, & Garmezy, 1990). Through this focus on the mechanisms underlying resilient functioning, researchers have begun to study how they can increase the relative balance of protective factors over risk factors in order to engineer resilience and help individuals turn adversity into advantage (Luthar, Chicchetti, & Becker, 2000). Distinct from lay definitions of invulnerability,

resilience signifies the achievement of positive adaptation or adjustment—which defies expectations—in the face of significant adversity (Wilkes, 2002).

3.3.3.2 Models of resilience research

Person-based Analysis

Resilience research emerged from phenomenological studies identifying the characteristics of survivors living in high-risk situations rather than from a theoretically grounded model (Richardson, 2002). This person-based approach to studying resilience compared individuals with different profiles in an attempt to capture the naturally occurring configurations that distinguish resilient individuals from others (Masten, 2001). The typical design of person-focused studies of resilience identified individuals with good adaptive functioning, and compared these with individuals from the same high-risk context who have maladaptive functioning in order to determine what attributes account for the differences in outcome (Roisman, 2005). While well suited to searching for patterns involving multiple processes occurring across time, Werner (1995) reported that this approach may have obscured specific links or pathways which provide explanatory clues to how resilience is developed. A final design employed by person-focused studies of resilience might be described as longitudinal classification analysis (Vogt, Rizvi, Shipherd, & Resick, 2008). This type of research compared healthy developmental pathways with maladaptive development across extended periods of time. One characteristic of this longitudinal design to a person-based study of resilience is that it often involved the investigation of dynamic interaction between multiple aspects in the development of resilient pathways over the course of individuals' lives, whereas some have argued

that, because of their inherent variability, these interactions are not well suited to aggregate study (Rutter, 1987).

Variable-based Analysis

Variable-focused approaches to resilience research rely on multivariate statistical procedures to identify links between the degree of adversity, outcome, and individual or contextual qualities that may exert a protective function from the consequences of the adversity (Masten, 2001). In contrast to the sense of the whole in many person-based studies, a variable-focused design is better suited to searching for links between individual predictors, such as risks and assets, and resilience outcomes (Rutter, 2012). This type of resilience research often measures the independent contribution of discrete risks or assets to the outcome of the criterion variable – that is, resilience. One objective of research that investigates these main effects is to offer models of intervention that might offset the risks by counterbalancing or mediating them with positive assets (Garmezy, Masten, & Tellegen, 1984; Maddi, 2005).

For some time research findings have been implicit that risks, assets and other protective factors may influence each other at different levels and that these variables may exert a bi-directional influence on the developmental trajectory of resilience (Bonanno, 2004; Richardson, 2002). But, it is only very recently that resilience research has begun to take a more integrated and transactional view of all the individual and contextual variables that contribute to the development of this outcome (Cacioppo, Reis, & Zautra, 2011; Chicchetti, 2010). Until the past several years, very few variable-based studies of resilience accommodated these integrated, dynamic aspects of development in their research design (Zautra, Hall, & Murray, 2008). Some

very recent studies of resilience have begun to incorporate a cross-disciplinary view of development and adaptation into their research design. These studies have drawn on developmental psychology, biology, and neuroscience to shed new light on how resilience develops and functions (Charney, 2004; Wu et al., 2013).

3.3.3.3 Teacher resilience

In direct contrast to the personality construct of hardiness, which has had very few connections made between it and teaching (see Chan, 2003 for one notable exception), there is a growing body of research examining the phenomenon of resilience in teachers. Teacher resilience has been defined as a teacher using all the resources available in a productive way to achieve learning success with the students in the face of adversity and detrimental conditions (Day & Gu 2014; Patterson, Collins, & Abbott, 2004). Much of the research on teachers has undergone a shift in focus from deficit models and negative emotions (e.g., those associated with stress and burnout) to models of success and perseverance, and this is in line with the move to address teacher attrition by promoting quality retention (Day, Sammons, Stobart, Kington, & Gu, 2007). A fairly in-depth understanding of the reasons for teacher attrition exists (some of which I have mentioned in earlier sections), but it is unclear what this contributes to the question of why many teachers stay and experience success in the profession (Mansfield, Beltman, Price, & McConney, 2012). Instead, teacher resilience research is concerned with how teachers manage and sustain their motivation and commitment, recover in the face of adversity, and develop increased self-efficacy through consistent achievement in the classroom (Gu & Day, 2007; Johnson, et al. 2014; Kelchtermans, 2011).

In their comprehensive study of 300 teachers at various career phases in 100 schools over a four year period, Day et al. (2007) proposed that despite the increased pressures and deteriorating conditions in contemporary teaching contexts worldwide, the majority of teachers do in fact adapt or survive. This suggests that a form of psychological invulnerability may be a key factor in teachers' teaching effectiveness and long-term commitment to the profession. Data from this study indicates that teacher resilience is multidimensional, socially-constructed in nature, and develops in more than one way (Gu & Day, 2007). While all humans may be born with the biological capacity to develop resilience (Masten, 2009), a variety of personal and social or professional factors enhance or inhibit the extent to which teachers learn or acquire these resilient qualities (Knight, 2007). Thus, Day et al. (2007) consider teacher resilience not as innate, but as a dynamic, relative, and developmental quality. Furthermore, like others, they find that as resilience manifests itself in response to a demand it can also develop and change with emerging conditions or contexts (Chicetti, 2010). Gu and Day's (2007) investigation found resilience to be a key factor in teachers sustaining their commitment to the profession, achieving optimal teaching effectiveness, and to students' progress and attainment on national tests. They are also confident that, while it may not be fixed or stable, resilience can be built or accrued. This is fortuitous as they contend that resilience is a necessary condition for teachers to be effective.

Several researchers have focused more specifically on the potential for resilience in pre-service or novice teachers (Bobeck, 2002; Howard & Johnson, 2004; Tait, 2008). Given the varying levels of preparation and competence of beginning teachers, these studies all argue that resilience is a crucial contributor to career

preparation, teaching effectiveness, and persistence in the profession past the first year or two (Johnson et al., 2014). Howard and Johnson (2004) conducted a study of teachers working at three disadvantaged schools in the suburbs of a large Australian city, they reported that the resilient teachers learned a handful of strategies or dispositions which permitted their survival; These included a strong sense of agency giving them the ability to control what happened to them, strong networks of caring others, competence in areas of personal importance, and pride in their achievements. Howard and Johnson's (2004) findings are in line with the components of teacher resilience that Bobeck (2002) identified in her study of teachers-in-training, citing significant productive relationships, career competence and skills, personal ownership, and a sense of accomplishment as the necessary resources for teachers to develop resilience early on in their careers. Tait's (2008) study of the teacher recruiting, training and induction process in Canada suggests that there are particular parallels between the indicators of teacher resilience on the one hand, and self-efficacy and emotional intelligence on the other. With regard to their emotions, their motivation and their behavior, resilient teachers developed characteristics that mirrored efficacious and emotionally intelligent teachers and which appeared to provide the foundation for success and long-term commitment to the profession.

Other recent studies have investigated whether teachers can practice resilience and thus develop it through intervention (Brunetti, 2006; Castro, Kelly, & Shih, 2010; Le Cornu, 2009). In a study of 15 teachers who employed specific resilience strategies when they experienced anxiety-provoking or disruptive encounters at school, Castro et al. (2010) found that teachers can learn to "navigate and overcome" (p. 628) the pressures and adversity that are inherent to the profession. Collecting data from nine

teachers working in inner city high schools in California, Brunetti (2006) reported that in the face of the immense hurdles these teachers faced, they were able to sustain their resilience while under fire, persist in the profession, and even achieve some measure of success with their students. He suggested that resilience can be enhanced, strengthened or honed if the conditions and support teachers need to perform at their best are available. Le Cornu's study (2009) examined the potential role of what she calls "learning communities" (p. 717) in fostering and building resilience during the professional experiences of teachers. She reported that providing opportunities for peer support, explicitly teaching protective skills or attitudes, and adopting clear supportive roles in the workplace contributed to resilience building in teachers who previously did not exhibit this capacity.

Teacher resilience research has been around for just over a single decade, but it is rapidly growing into a field of importance given the need to address unprecedented levels of teacher stress, burnout, and teacher attrition (Day & Gu, 2014). Resilience research offers a way to investigate the attitudes and behaviors of teachers who do remain in the profession, and how these individuals maintain their commitment, motivation, and engagement (Mansfield, Beltman, Price, & McConney, 2012). The trickle-down effect has brought insights and agendas from the positive psychology literature to educational research, and the broader educational implications of developing teacher resilience are just as important. Some have stated explicitly that students cannot be expected to develop resilience if their teachers do not exhibit this ability themselves (Bobeck, 2002; Brunetti, 2006). Research into academic resilience has shown that the capacity for resilience in students is linked to prosocial behavior and peer acceptance, school attendance, class participation and

responsiveness, self-efficacy, motivation and aspirations, and ultimately, long-term academic success (Martin & Marsh, 2006, 2008). However, any developmental model of educational resilience in students will not be able to ignore the role of resilient teachers (Morrison, Brown, D’Incau, Larson–O’Farrell, & Furlong, 2006). Educators who want their students to develop the capacity to successfully adjust to threatening circumstances must first develop it themselves (Day, 2004; Prince–Embury, 2011).

3.3.3.4 Issues in resilience research

One of the more prominent issues in resilience research concerns the surprisingly widespread occurrence of resilience (Murray & Zautra, 2012). Early studies discussed the notion of invulnerability as an exceptional ability, and this was not questioned until more recently (Masten, 2001). The consensus in most research, albeit implicitly, is that many researchers have underestimated the pervasive nature of resilience (Litz, 2005), and that resilience is much more ordinary than initially thought (Wilkes, 2002). However, the very first studies which focused on the development of resilience in children at risk for psychopathology did not come to this conclusion; they in fact highlighted the finding that successful adaptation in the face of debilitating circumstances was an extraordinary capacity (Luthar, Chicchetti, & Becker, 2000). Masten has termed this “ordinary magic” (2001, 2009) to emphasize that resilience is a naturally occurring phenomenon that arises from the interaction of the adaptive systems that foster and protect human development and psychological recovery.

While numerous researchers argue for the multidimensional, situated nature of resilience, very few have concerned themselves with its dynamic nature (Ungar,

2012). Some findings have shown that resilience is not absolute, and that resilient individuals show considerable fluctuation over time (Egeland, Carlson, & Sroufe, 1993). However, little empirical attention has been paid to fluctuations and ongoing adjustment of resilient outcomes, and the impression this provides is one of resilience as a static state once it has formed (Luthar, Chicchetti, & Becker, 2000). This issue is perhaps not surprising given that very few resilience studies are designed to collect longitudinal data or record the fluctuations of vulnerability and protective factors and the resulting deterioration and amelioration of adaptation that some suggest is the norm in most resilient individuals (Masten, Best, & Garnezy, 1990). It is incorrect to assume that a developmental trajectory which allows successful adaptation to adversity is likely to just stop at the first sign of adaptation being achieved. Instead, research findings indicate that adaptation is ongoing beyond the observed time frames of the studies in question (Rutter, 2012).

A comprehensive range of protective factors has been identified in the resilience literature, and these have proven surprisingly consistent over several decades of research (Masten, 2009; Wu et al., 2013). But a rather glaring omission in much of the literature is the discovery by some that protective factors do not necessarily yield resilience. The reasons for this are not yet fully understood, but there are notable instances where protective factors were shown to be in operation and yet resilient outcomes did not result (Masten, Best, & Garnezy, 1990). It may be that this issue is one reflection of the complexity of the process of resilience formation. When a range of risk and protective factors interact and achieve the adaptation termed resilience, this may be a form of self-organization. To-date, there have only been a handful of studies which have looked at resilience from the perspective of self-

organization (Chicchetti & Rogosch, 1997; Schutte, Toppinen, Kalimo, & Schaufeli, 2000).

Given the above issues, there are growing concerns about the rigor of theory and research surrounding resilience (Lipsitt & Demick, 2012; Zautra, Hall, & Murray, 2008). There has been significant spillover from resilience research in psychology into other fields such as engineering and urban planning (Moser, 1998), economics (Hamel & Valikangas, 2003), social-ecology (Lebel et al., 2006), climate change (Bodin & Crona, 2009), and crisis and disaster response (Masten & Osofsky, 2010). The concept of resilience has also been used with growing frequency in the global media in the context of financial crises and natural disasters which has resulted in a more everyday significance to the term (Mansfield, Beltman, Price, & McConney, 2012). The current controversies surrounding resilience are reminiscent of the concerns voiced about other popular psychological constructs, such as hardiness. The resilience movement will need to address these unresolved issues in the years to come if it is to avoid languishing in conceptual superficiality (Ungar, 2012).

3.4 Conclusion

In a quest to establish a theoretical basis for a unified metaphor that might be applied to the data of the research that I report on in later chapters (i.e., chapters 6 and 7), this chapter began with an overview of the mechanisms of human immunity, namely the innate and acquired immune systems, and their purpose in maintaining an individual's stable physiological functioning. This included a snapshot of those hyperactive immune responses which result in counterproductive manifestations of human immunity (i.e., autoimmunity and allergy). These undesirable immunity

outcomes, the evidence indicates, arise from regulatory imbalances or malfunctioning shielding mechanisms in the system. I then examined three areas from the psychology literature which can be seen as providing insight into the question of how individuals come to survive and thrive despite the experience of emotional upheaval and threats to psychological well-being. It is apparent that coping occupied a position of prominence during the 1970s and prior to that, whereas hardiness came into its own during the 1980s and reached maturity in the 1990s. Resilience, however, has established itself as the more prominent construct since then, and has now been researched widely in the teaching profession as well.

This comprehensive look at the ways in which the notion of safeguarding and buffering a system against disturbances and threatening circumstances has been conceptualized in various fields will allow for a finely nuanced explanatory construct that can inform my results and discussion in later chapters. Before turning to the research methods used and the data findings, however, I will first consider the issue of situating my research within a framework that places explicit focus on context and dynamic change, and can accommodate notions of complex causality.

4. Complexity Theory

4.1 Introduction

This chapter functions as a bridge between my review of several diverse areas of literature above, and a subsequent chapter in which I outline the research design and methods used. In this chapter I will shift my focus to exploring the utility of *complexity theory* as a conceptual framework for research in applied linguistics. Following many existing overviews, here I have adopted the term complexity theory because it is the most inclusive term under which mutually intelligible and complementary foci such as nonlinear/dynamic(al) systems theory, synergetics, emergentism, and chaos theory exist. In examining the lexicographic underpinnings of the term complexity, Morowitz (1996) suggested that many of the phenomena scientists wish to investigate—in particular those related to the human experience—have become too complex for the simple tools that exist with which to study them. Nowotny (2005) went one step further by proposing that humans are locked in “a complexity race” (p. 20): our manipulation and intervention in the natural and social world results in ever more complexity, while we simultaneously seek new methods to reduce the increased levels of complexity in response to this.

I will begin this chapter by examining the assumptions underlying this theoretical perspective, which could be seen as considerations of how one thinks about the world and its phenomena. Because this is an area that is potentially too large for any one review, I necessarily limit myself to the most central notions that can be found in almost any domain of complexity science. I then segue into looking at the endeavor of research from within this paradigm in order to establish the ways in

which the complexity meta-theory might inform research in applied linguistics, and how it may assist in plugging gaps left by conventional research paradigms.

4.2 The Contribution of Complexity to Applied Linguistics

It was nearly two decades ago that Larsen–Freeman (1997) first proposed that applied linguistics issues could profit by being viewed explicitly in complexity terms. The earliest explicit attempts to form connections between phenomena of interest to applied linguists and the theoretical principles of complexity (e.g., Ellis, 1998; Larsen–Freeman, 1997) were a radical departure from what was, at the time, the norm. However, currents of corresponding sentiment had already begun to emerge in the work of other scholars who did not explicitly associate themselves with CT (e.g., Dörnyei & Malderez, 1997; MacWhinney, 1998; Meara, 1997; van Lier, 1988). While in the intervening years, complexity theory (CT) has not established itself as the dominant paradigm in second language acquisition (SLA) research, it has gained considerable currency (Larsen–Freeman, 2012). More importantly, however, complexity has persisted not only because it is a useful metaphor, but because it is an empirical reality (Morin, 2008), and one that has yielded significant insight into second language acquisition and applied linguistics more broadly.

Since Larsen–Freeman and Cameron (2008a) first offered a novel perspective on long-standing questions to which traditional paradigms had failed to offer satisfying answers, CT has virtually exploded into domains as diverse as English as a lingua franca (Baird, Baker, Kitazawa, 2014) sociolinguistics (Blommaert, 2014), multilingualism (de Bot, 2012; Jessner, 2008), educational linguistics (Hult, 2010), L2 pedagogy (Mercer, 2013), conversation analysis (Seedhouse, 2010), and even

language teacher cognition (see Burns, Freeman, & Edwards, 2015). The fact that understandings from CT now appear central to the concerns of most applied linguists signals that CT is here to stay. The inescapable fact is that many researchers have begun recognizing that CT principles are indispensable for consolidating existing understanding and for opening up new paths of discovery—even in domains that did not interface with complexity in their original conceptualization or empirical validation.

Examples in which CT has become an integral part of empirical research include L2 anxiety (Gregersen, MacIntyre, & Meza, 2014), learner language (Larsen–Freeman, 2006; 2010; Spoelman & Verspoor, 2010), lexical development (Verspoor, Lowie, & van Dijk, 2008; Zhang, 2012), L2 motivation (Dörnyei, MacIntyre, & Henry, 2015; Waninge, Dörnyei, & de Bot, 2014), L2 writing (Baba & Nitta, 2014; Verspoor, Schmid, & Xu, 2012), the self-concept (Henry, 2015; Mercer, 2012, 2014), and willingness to communicate (MacIntyre & Legatto, 2011). This evidence demonstrates that acceptance of CT principles is reaching a critical mass in our field. The current level of uptake of CT principles suggests the existence of a coherent “new normal” that has begun to spread dynamically throughout mainstream applied linguistics (Larsen–Freeman, 2012, 2015a, 2015b). This however raises several pertinent questions to which I turn to immediately.

4.2.1 Is complexity a theory?

Even within other disciplines complexity has yet to be articulated in such a way that it could be termed a theory per se (Manson, 2001). Anderson (1994) highlights eight popular ways in which researchers have addressed complexity, but a

precise definition of the term remains elusive. In examining its appropriacy for social inquiry, scholars have indicated that among other things, complexity functions as

- (a) an interpretive paradigm for understanding the social world (Byrne, 1998);
- (b) a methodological frame of reference (Byrne, 2005);
- (c) a worldview or scientific understanding (Cilliers, 2005);
- (d) a transdisciplinary discourse (Klein, 2004);
- (e) principles that constitute a habit of thought (Kuhn, 2008);
- (f) an approach to describing and explaining change (Mason, 2008);
- (g) a unified conceptual framework for understanding social structures (Urry, 2005);
- and, (h) a conceptual toolbox (Walby, 2007).

Because of this wide range of functions, it would be more accurate to adopt a usage that is closer to what Larsen–Freeman (2013, 2015a) has termed a meta-theory—a set of coherent principles of reality (i.e., ontological ideas) and principles of knowing (i.e., epistemological ideas) that, for applied linguists, underpin and contextualize object theories (i.e., of language and language development) consistent with these principles.

The complexity meta-theory groups together a set of relational principles (Overton, 2007, 2013), namely that certain phenomena involve multiple parts changing together through dynamic, non-linear processes that lead to striking emergent patterns over time (Holland, 2012). Complexity as a meta-theory represents a set of powerful intellectual tools and concepts “capable of informing all theories” (Morin, 1992, p. 371). These conceptual tools serve as a rigorous aid to thinking and theorizing, as well as conducting and evaluating research about the human and social world. Complexity, then, is a meta-theory for investigating the nature of, and reasons

for, dynamic change and emergent, ordered outcomes in the social world. While it is often acknowledged that social science represents a parallel reality to the natural sciences (Kiel & Elliot, 1996), the contemporary shift toward using complex-systemic understandings as the foundation for human and social inquiry suggests that a paradigmatic reorientation is rapidly becoming part of mainstream intellectual culture (Koopmans, 2009). Consequently, exploiting a shared scientific lexicon may increase interdisciplinary communication and lessen mutual distances (Larsen–Freeman, 2012).

4.2.2 Is complexity compatible with a conventional philosophy of science?

Perhaps for evolutionary reasons, humans do not possess a robust innate ability to think in terms of the combined interactions of many individual parts, or to deal with the effects of complex systems or situations where these outcomes are multi-determined (Northrop, 2011). Instead, humans rely heavily on the kind of explanation and extrapolation that is consistent with our intuition, often oversimplify our predictive analyses of outcomes, and have the tendency to attribute causality to single factors (Dekker, Cilliers, & Hofmeyr, 2011).

Although there is an element of artificiality in attempting to analyze complexity, Morin's (2007) distinction between *restricted* complexity and *general* complexity is informative here. The first, similar to critical realism, recognizes the ontology of complexity but “employs modes of explanation with which...science is comfortable” (Byrne & Callaghan, 2014, p. 39), while the latter rejects the “universal value of reductionist explanation” (p. 57) and contends that importing the quantitative methods privileged by the physical sciences into the social sciences is misguided (Byrne, 1998, p. 17, 72). In both instances complexity is equally incompatible with

notions of linear mono-causality, randomized controlled experimentation, and parts-to-whole aggregation (Eve, Horsfall, & Lee, 1997). CT broadly rejects the notions that to fully understand a system it must first be reduced to its smallest constituent elements; that change follows deterministic laws which can be easily predicted or reversed; or, that a single objective representation can be established for any system (Radford, 2008). The belief that causal mechanisms exist as absolutes and operate independent of other properties, relationships, or systems is also obsolete (Groff, 2008). Thus, complexity's value in informing empirical work is that it transcends the reductionist-deterministic philosophy of science with its revolutionary logic of description and causal explanation (Castellani & Hafferty, 2009; Gershenson, 2007).

In practice, CT research may be able to accommodate confirmation of hypotheses, causal explanation, and generalization, simply not in the conventional modes of this activity (Byrne & Callaghan, 2014). CT encourages researchers to develop a different logic of explanation that specifies the kind of causality, generalization, and hypothesis confirmation being dealt with, along with the precise scope and limits of each of these (Byrne & Ragin, 2009). What, then, would these revised notions look like? The consensus is that singular variables cannot be causes. Instead, effects (i.e., system outcomes) are the contingent products of multiple complex adaptive mechanisms, and causal analysis must explain why the course of development ultimately led to the outcome in question, rather than to alternative ones (Morrison, 2012). The fact that the complex social world presents a set of phenomenological outcomes and self-organized processes which are found in recurring instances and guises has real significance for this project (De Wolf & Holvoet, 2005).

4.2.3 Does complexity require researchers to discard their existing methodological toolkits?

Until fairly recently, applied linguistics research favored analytical methods for partitioning and isolating objects of inquiry into variables or mechanisms to determine current behavior, track the past, or predict a future (Lowie & Verspoor, 2015). This “preference for the [methodological] artifice of simplicity” (Larsen–Freeman & Cameron, 2008a, p. 1) stands in contrast to the growing momentum for what some have dubbed the complexity turn in SLD research (Dörnyei, MacIntyre, & Henry, 2015; Ellis & Larsen–Freeman, 2006). As with other theoretical frameworks (e.g., critical or sociocultural theories), complexity does not offer ready-made research templates, nor should it be expected to. The real and more exciting contribution the complexity perspective makes is not purely in the realm of methods of instrumentation and analysis (e.g., microgenetic or set-theoretic methods), but instead is in ontological and epistemological considerations of how researchers think about the world, considerations that are linked with methodological issues of how researchers engage in scientific inquiry (Larsen–Freeman & Cameron, 2008b; Ortega, 2012). Within the applied linguistics community, CT has the ability to offer a set of deliberate, consensus-forming considerations regarding (a) the subjects or phenomena chosen for study, (b) the type of questions explored in relation to these subjects, (c) how empirical research is designed and conducted, and (d) how the results are analyzed and interpreted.

Because CT is a meta-theory, it does not dictate the use of unique research methods, nor does it exclude existing research methods so long as those methods are

fundamentally compatible with the principles of complexity (Byrne, 2011). Instead, complexity is grounded in the phenomenological reality of the social world and calls for an inquiry-driven approach to research that emerges from the needs of inquiry, not one determined by disciplinary boundaries (Morin, 2008). In a sense, then, there are no such things as “methods of complexity” because CT encourages innovation and diversification in understanding complex social phenomena (Wolf–Branigin, 2013). Complexity is a problem-driven, inclusive approach to social inquiry that encourages expansion of existing methodological repertoires, and CT might gain greater traction in applied linguistics research if scholars recognized that CT encourages repurposing existing methods and techniques—both qualitative and quantitative—to ensure they are congruent with the complexity framework (van Geert, 2008). It is true that no one particular framework is the singular solution to the challenges of understanding the complexities of SLA (Ortega, 2012). Nevertheless, by emphasizing dynamic change, interconnectedness and multicausality, and by discouraging determinism, reductionism and precise prediction, this new complexity agenda provides a truer perspective for looking at existing problems and opens the door to reconfiguring the field’s program of knowledge and to making better sense of SLA phenomena (Larsen–Freeman, 2013, 2015a).

4.3 Complex Systems as a Unit of Analysis

In the complex social world, the basic unit of analysis that reflects this complex reality is a *complex system* (Jörg, 2011; Ragin, 1992). While the field of complexity has yet to define a “system” in a widely-accepted way (Goldstein, 2011), it may at least be possible to draft some generally agreed upon characteristics.

Systems are sets of interacting components or variables that form a state of some sort. “Complex” references the large number of interdependent elements that make up the system, which is sometimes termed complete interconnectedness (Straussfogel & Von Schilling, 2009). These elements are in a “dynamic” pattern of interaction over time which often results in changes for individual elements as well as for the system-wide behavior. This temporal aspect of change is a central notion of the dynamic, adaptive behavior of these systems (van Geert, 2009). In the human and social domains, a necessary additional dimension of a system is an agent (Holland, 2006; Lansing, 2003). Distinct from the more general meaning in CT, “agent” here means people, or collections of people, capable of exercising independent choice or intentional action that contributes causally to any behavior of the system (Al-Hoorie, 2015).

Because “there is nothing metaphysical about complex systems” (Cilliers, 2000, p. 31), the most tractable approach may be to restrict the term system initially to something that has concrete phenomenological validity, or real existence within a physical or geographical space. This view, that systems are real entities which reflect the operation of actual causal mechanisms, is consistent with the notion in social complexity of a case as a complex system (Uprichard, 2013). Specifying phenomenological boundaries of a unit of analysis for investigation—a process termed “casing”—is crucial because it allows the researcher to focus more explicitly on a narrow band of phenomena (Harvey, 2009). Casing, a process deeply rooted in CDS logic (Byrne, 2009b), is often centered on outcomes or typical instances of a phenomenon that is under investigation (Miles, Huberman, & Saldaña, 2014; Ragin, 2009b). Caution must be exercised to not take for granted that the unit under

investigation is a complex system (Larsen–Freeman & Cameron, 2008b); it may actually be a simple or closed system, or not a system at all.

To extend existing definitions (de Bot & Larsen–Freeman, 2011, p. 9; Larsen–Freeman & Cameron, 2008a, pp. 36–38) with these criteria, for research purposes a complex system:

- has concrete phenomenological validity;
- is composed of multiple connected and interacting parts (the absolute number of which is determined by the nature or makeup of the system), including an agent (or agents);
- is open to adaptive feedback, and experiences dynamic, non-linear changes in behavior;
- is part of the context that is part of it;
- and, exhibits emergent outcomes (i.e., higher-order patterns of behavior).

How these systems adapt to their environment in order to maintain their functioning is a question with relevance nearly every field (O’Sullivan, 2009). I now turn to these developmental characteristics that are crucial for understanding the behavior of complex dynamic systems.

4.3.1 Sensitive dependence on initial conditions

Each and every system has a history (De Villiers–Botha & Cilliers, 2010). History and context have a critical role to play in the process of becoming in which every system is engaged. In a system, where many kinds of components and factors interact over time, small differences in some factors at an early point in time may

have a substantial impact on the eventual adaptive outcome (Kauffman, 1995). In a nonlinear system such as a language classroom, an economy or even a biological system, a small discrepancy in one component at one time can lead to large differences in a later state. A slight difference in the initial conditions can have huge implications for future behavior (Prigogine & Stengers, 1984). Complex adaptive systems evolve rules which participate in influencing the actions of the components and by extension the self-organized outcome of the system. John Holland (1992) in particular argues that the system selects for the strongest rules as it adapts and evolves alongside those which allow the system to perform or develop optimally. Thus, even in systems that appear to be identical, the rules that develop to guide the subsequent adaptation may diverge significantly (Holland, 2012). This is evidence of the rich interdependence of all the components in the system which illustrates how tiny differences in initial inputs can quickly become overwhelming differences in output (Kelso, 1995).

4.3.2 Adaptivity and learning

Very little in the social world is fixed. Change is everywhere. First and foremost, systems constantly reorganize their internal working parts to adapt themselves to the problems posed by their surroundings. By evolving indefinitely over time systems attempt to improve their ability to survive the interactions with their surroundings (Nowak, Vallacher, & Zochowski, 2005). This adaptation progresses without a predetermined, fixed goal. Instead, systems can be said to iterate so that they may return to the same state repeatedly as they continue to move and change (Kelso, 2002). Secondly, while they are adapting systems are able to learn from

experiences and conditions, and this adaptive learning in turn influences their ongoing behavior (Prigogine & Stengers, 1984). The ability of the parts to adapt and learn is a prime characteristic of systems. Through this sustained adaptation systems are capable of producing a rich repertoire of behaviors, and this “moving target” (Holland, 1992, p. 18) can therefore be difficult to understand and control. However, there is another feature that contributes still more complexity to these systems: through learning systems come to anticipate. In seeking to adapt to changing circumstances, the parts develop rules that anticipate the consequences of certain responses (Holland, 2006). This emergent ability to anticipate is one of the least-understood features of systems, yet it is also one of the most empirically compelling.

4.3.3 Feedback loops

As I have mentioned, complex adaptive systems do not remain passive to changing events but rather learn or adapt to an ever-changing environment. This precise quality gives systems their reputation as adaptive and feedback-sensitive (Gell–Mann, 1994). In CT terms, *feedback* is simply an input that can influence change (Davis & Sumara, 2006). Feedback loops have also been called the central “nervous system” (Newman, 2009, p. 4638) of systems. Although feedback often originates from some external source, such as the environment or another dynamic system, it can also originate from interaction between the system’s components. Negative feedback is the most common type found in systems; its role is simply to dampen system change or adaptation (O’Sullivan, 2009). This negative feedback impacts the systems by restoring equilibrium and bringing its behavior back in line. A system governed only by negative feedback, however, is by definition “dead” and not

adaptive (Banzhaf, 2009). Positive feedback, on the other hand, reinforces a system's adaptive changes along the development path which it is already moving, creating unstable patterns that may reach the point of total loss of integrity in the system (Straussfogel & Von Schilling, 2009). Thus, positive feedback amplifies movement in the system that can spread to *path dependence*—the idea that iterative patterns of feedback with each repetition may lock-in the system to a path of development (Lewis, 2005). Nevertheless, a system is never fully adapted to its environment because the process of evolution of the system will itself change the environment so that a new adaptation is needed, and so on (Nowak et al., 2010).

4.3.4 Openness

A system not only interacts with its environment or surroundings continuously, but it is also an integral part of the context in which it exists (Ushioda, 2015). Any complex system is an open synthesis of many small parts interacting with one another and the larger context it is situated in. All social and natural systems possess or establish functional boundaries that set them slightly apart from the environment and demarcate where their constitutive components start or stop (Eoyang, 2004). But, rather than cutting off the system from the rest of the environment, these boundaries remain open and allow the system to remain adaptive and robust. The system-environment behavior that is made possible through the openness of the system boundaries is an important way that a system actively tries to turn its experiences to its advantage (Eoyang, 2003). These open boundaries connect the system with its environment through a phenomenon known as “coupling”. In the absence of a coupling relationship, minimal bi-directional exchange between the system and its

environment will take place. And without this transfer of energy, resources, or information, system-wide adaptive patterns of self-organization are unlikely to occur as there is no impetus to change (Haken, 1985). Because they encourage adaptive behavior, systems' openness and coupling to the environment give rise to outcomes that can be explained once observed, but not predicted a priori (Reitsma, 2003).

4.3.5 Self-organization

Given the right conditions or inputs over time, many things in life tend to sort themselves out even better than if those involved had sat down and tried to force a solution. When systems change their internal structure or their overall aggregate function in response to some external circumstances through a process that is understood to be independent of overt direction, this illustrates *self-organization* (Dekker, Cilliers & Hofmeyr, 2011). As they make their way through time systems display new patterns that could not have been anticipated by looking at their component parts one by one. Self-organization is a process that is at the very heart of the behavior of systems, so much so that it is easy to take for granted the clearly recognizable patterns it leads to in the lived world (Manson, 2001). However, even detailed knowledge of a complex dynamic system's components and how they interact can rarely provide researchers with the know-how needed to predict the patterns that will result from their interaction (Johnson, 2009). Are self-organized aggregate patterns predictable in any way, or do they just appear out of the blue? Can they be controlled or even manipulated? Determining how this spontaneous self-organization takes place is the primary goal of CT (Larsen–Freeman, 1997), but there are still very few frameworks in existence that can assist researchers in describing and

modeling the processes of self-organization in systems (Holland, 2006). I return to this in a later section when I discuss one possible model for doing this.

4.3.6 Soft-assembly

Finally, most research in the social sciences is grounded in the assumption that adaptation and development are based on rule-driven mechanisms which are hard-assembled (Thelen & Smith, 1994). Hard-assembled mechanisms are independent of the immediate context in which the system is nested, they apply across multiple contexts, are discovered independent to performance, and exist off-line in some form of inactive, absolute state (Larsen–Freeman, 2015b). In contrast, soft-assembled mechanisms emerge, they are contextually constrained, and they involve a particular adaptation of the system in its environment (van Geert, 2009). A characteristic feature of many systems is their remarkable flexibility (i.e., their adaptivity) and their tendency to compensate for varying contexts and environmental situations (Kloos & Van Orden, 2009). Soft-assembly is temporary, takes place in real-time, and involves only tools and structures that are currently available and necessary. Soft-assembled mechanisms come into existence and are only realized within the immediate context of a situation or task (Thelen, 2005). Clearly, the context or environment in which a system is embedded cannot be seen as merely one factor that must be considered to interpret the system’s behavior (Larsen–Freeman & Cameron, 2008a). Instead, contextual factors could be seen as actual parameters or dimensions of the system itself (Goldstein, 2011).

4.4 Complex Dynamic Behavior

Above I have suggested that in CT research cases are the methodological equivalent of complex systems, but systems by themselves are clearly of less inherent interest than their dynamic processes of change and emergent outcomes. The term “dynamics” has its origins in the Greek *dynamikos* (van Geert, 1998) meaning “powerful”. This is apt because the most compelling thing about the manner systems behave is the process of change and the forces acting in patterns that bring about this change. Just as importantly, forces at play in system behavior are also the central concern in much of applied linguistics research (Larsen–Freeman & Cameron, 2008b). Below I use three major aspects of dynamic system behavior—emergence, self-organization, and attractor states—as points of reference for investigating how that change takes place.

4.4.1 Emergence and self-organized behavior

Self-organization refers to the spontaneous pattern formation and change in complex dynamic systems, and can be seen as a robust general process that leads to emergent outcomes (Eve, Horsfall, & Lee, 1997). When these systems change their internal structure or their overall function in response to some external circumstances through a process that is understood to be directed solely from within the system, this is called self-organization (Banzhaf, 2009). Self-organization may account for many important aspects of human behavior such as learning and cognitive development (Kelso, 1995), and determining how this self-organization takes place is the primary goal of complexity science. However, self-organization remains under-theorized and

as a result very few frameworks exist for describing this process (Holland, 1995, 2006).

To reiterate an earlier point, the number of salient patterned outcomes observable in the human and social world is finite (De Wolf & Holvoet, 2005). These novel emergent outcomes at the system level cannot be inferred or explained from the discrete interactions of groups of components alone. In each case, individual components manage to acquire collective properties that transcend the individual parts (Holland, 2012). Emergence is tied to the notion of attractor states, which represent outcomes or states of dynamic equilibrium that a system stabilizes into. While outcomes account for what a system is doing now and the state in which it has stabilized, it is the adaptive changes that provide a temporal narrative for the process of how and why the system got here, and where it may be going to. As outlined earlier, one pivotal characteristic of complex systems is that of dynamic change and adaptation, which may be gradual or dramatic. Specific mechanisms of change produce a particular time signal (i.e., pattern or trajectory of change over time) in the system which is essential for understanding the causal complexities of system development or change. Just as the emergent states for a system are not unlimited, the trajectories to those outcomes are more-or-less finite, although the dynamic behavior may include rich variations or facets that are diachronically asymmetrical (Elman, 2003).

A board game provides one illustrative analogy of these emergent outcomes. The state of a game at any given time is the placement of pieces on the board, and gameplay consists of moving pieces around the board from configuration to configuration based on the rules of the game. Similarly, a state space is the landscape

on which all potential placements for a system phenomenon (i.e., outcome states) can be found. Along with salient dynamic outcome patterns it is necessary to investigate the unique *signature dynamics* as these are the robust causal mechanisms within a system that allow a researcher to offer a parsimonious account of the gameplay that led that system to produce those outcomes. Only a finite number of possible attractor states exist for a given system, and identifying these may reduce much of the unpredictability of complex systems' functioning and allow researchers to make informed choices about how to interact with emergent outcomes.

One existing model of self-organization is Lewis' psychological model (2005) designed for the purpose of plotting the dynamic development of emotional appraisal. While its original purpose may render it unsuitable for immediate transfer to wider use without modifications, repurposing and adapting this framework slightly by bringing in broader theoretical insights might result in it having a more inclusive focus. In this revised framework (which I apply later on in understanding the data from the present research), four stages are central to the self-organization process: (1) triggering, (2) linking, (3) re-alignment, and (4) stabilization. The first two phases are concerned with behavior and interaction of system components on the local level, while the two latter phases shift up to a whole-system, global level (Jost, Bertschinger, & Olbrich, 2010).

Triggering

In the triggering stage, a perturbation causes a system disturbance similar to the ripples caused by a pebble thrown into still water. Instability is the generic mechanism that underlies most self-organized pattern formation, and this is because

individual elements in a system adjust and reorder themselves in response to changing conditions (Kelso, 1995). Because disturbances are essential to destabilize a dynamic system, the process of self-organization can only proceed if there is a trigger such as a perturbation (Kiel & Elliot, 1996). One key consideration is that the size of a perturbation and the size of its effect are seldom in a direct linear relationship (Kra, 2009): huge forces may have relatively little impact on a system, whereas other relatively minor glitches can lead to outcomes that are both unforeseen and catastrophic in magnitude (Dooley, 1997). If a perturbation is to impact a dynamic system's elements, it must trigger a response, or it will simply be absorbed into the system (Straussfogel & Von Schilling, 2009). Disturbances in a dynamic system can follow two possible paths: through amplifying they increase in strength to destabilize a system, or they can be subdued when subject to a damping force (Strogatz, 1994). Dynamic systems theorists refer to the path of amplification as positive feedback, and that of damping as negative feedback (Boschetti, Hardy, Grigg, & Horowitz, 2011).

Linking

During the process of self-organization behavior can be observed in which the system actively tries to turn what is happening to its advantage (Manson, 2001). This is when two or more elements interact in a way that develops intelligently (Reitsma, 2003). The technical term for element-to-element interactional linking is called *coupling* (Dooley, 1997). Coupling involves an exchange of energy or information in ongoing feedback loops. These allow new system-wide patterns of behavior that push the system away from chaos to emerge (Haken, Wunderlin, & Yigitbasi, 1995). As I have mentioned earlier, feedback loops are a two-way flow of energy or information

that is necessary to direct growth and change, and because of this they have been called the central nervous system of dynamic systems (Newman, 2009). Positive feedback reinforces the local perturbations until they impact the entire system while, simultaneously, negative feedback reins in unsustainable or run-away growth (O'Sullivan, 2009). It is because of this recursive feedback mechanism that complex adaptive systems are often referred to as *adaptive* and *feedback-sensitive* in their behavior (Kauffman, 1995).

Realignment

As a dynamic system adapts its internal structure it eventually crosses a threshold where the coupling produces enough coherence and structure, and the system begins to reconfigure itself towards stability (Thelen & Bates, 2003). This return to stability takes place in the realignment stage through the emergence of new higher-order patterns (Kiel & Elliot, 1996). When the outcome pattern of the dynamic system that has emerged in the realignment stage is different in some of its main qualities from what was started with, this new state is termed a major *phase change* (Boschetti, Hardy, Grigg, & Horowitz, 2011). The key to understanding changes such as these is that they are a result of a system's adaptive self-organization pushing it into an attractor state, and do not rely on any one component or on any linear process (Juarrero, 1999). Because these changes and new patterns in the dynamic system appear to have simply come about by themselves spontaneously, they are said to have *emerged* (Kauffman, 1995). Although self-organization at times appears to be random, there are in fact many pre-existing constraints that steer the path of the emerging stability (Goldstein, 2011). These are termed control parameters as a reminder that

nothing is random, and that there are pre-existing boundaries that the dynamic system must stay within (Gorochofski, di Bernardo, & Grierson, 2011).

Stabilization

Once the new pattern of stability is firmly consolidated in the dynamic system, it transforms itself into a new system parameter that buffers the system from future disturbances and allows it to avoid vulnerability to sudden instability (Tkačik & Bialek, 2009). This emergent order parameter that is a result of the self-organization process now begins to influence and determine future cycles of self-organization (Abraham & Shaw, 1992). Order parameters spread and restrict the future behavior of a dynamic system through what is termed *enslavement* (Haken, 1997, 2009). Because of enslavement, notions of causality are flipped on their head: the behavior of the internal parts cause the stable pattern in the dynamic system to form, and the stable pattern now begins to drive the behavior of the parts (Juarrero, 1999). This simultaneous top-down and bottom-up causation is referred to as reciprocal causality (Lewis, 2005; MacKenzie, 2005). In this stage there is credible evidence that complex adaptive systems have memory of the past and are able to learn from it to help guide their actions (Prigogine & Stengers, 1984). Because they are able to retain stability and functionality in their attractor state by responding to continuing disturbances based on their past experience of self-organization, in CT terms these self-organized systems are hysteretic (Kelso, 1995).

Social phenomena are unmistakably varied, but it is the norm rather than the exception to see stable patterns emerge in human behavior. These stable tendencies for systems are called attractor states—a critical value, pattern, solution or outcome

towards which a system settles down or approaches over time (Newman, 2009). Attractor states are essential in understanding emergent outcomes (Prigogine & Stengers, 1984). A patterned outcome of self-organization represents a pocket of stability for the system, and it can emerge without anyone purposely directing or engineering it into existence (Johnson, 2009). This closely mirrors phenomena across the field of SLA where dynamic collections of variables spontaneously self-organize into attractor states that represent higher-order patterns of equilibrium (Larsen–Freeman & Cameron, 2008a). Of course, the state which the system settles in over time does not have to be described numerically. It is, among other things, often categorical, theoretical, circumstantial or phenomenological (Goldstein, 2011).

4.4.2 Attractor states

Attractor states are critical values or states that a system evolves toward or approaches over time, but these do not actually exert a pulling force of attraction in the way that a magnet does (Haken, 2006). The term attractor is simply a convenient way to describe the behavior of a complex adaptive system as it moves towards some, and away from other, critical values (Holland, 2012). An attractor state simply describes what a system is doing right now or how it is currently acting, and the outcome or pattern it has fallen into through self-organization (Byrne, 2002).

Attractor states are generally thought to come about through interactions among the system's components (Banzhaf, 2009). They can often be created spontaneously if system parameters pass certain critical values. Attractor states may also emerge when a change in a system parameter causes the system to split into divergent paths of behavior (i.e., to bifurcate) and move towards entirely new attractors. Finally, values

borrowed from the system parameters themselves can become attractor states if they are consistent enough to achieve the critical mass to be “engraved” in the state space (Nowak, Vallacher, & Zochowski, 2005, p. 361).

The simplest type of attractor state is a fixed-point attractor state. The fixed-point of this state refers to a unique point of equilibrium in which the system tends to settle over time (Haken, 2006). In reality, because of the immense complexity of life, systems which only tend to settle into a single fixed-point attractor state are rarer than might be thought (Byrne, 1998). Periodic attractor states are one step up in complexity because they provide more possibilities for variations in system behavior than is the case for fixed-point attractor states. A periodic attractor state—also known as a limit-cycle attractor state—represents two or more values that the system cycles back and forth between in a periodic loop. Patterns emerge when events or behaviors repeat themselves at regular intervals (Abraham & Shaw, 1992). Strange attractor states—also known as chaotic attractor states—represent values which a system tends to approach over time but never quite reaches (Strogatz, 2003). The motion of a system in a strange attractor state is called chaotic because the dynamics trace a somewhat erratic or irregular pattern that never quite repeats itself, although these systems do in fact show complex forms of organization that can be understood after the fact (Gleick, 2008).

Complex dynamic systems do not, of course, magically end up in attractor states. Attractor states are assumed as a result of the system dynamics (i.e., the unique causal behavior and change in the system’s state that results from the interactions between the system variables/components) self-organizing (Juarrero, 1999). The state space is the metaphorical area in which a system’s attractor states exist, and it

represents all combined possible positions or outcomes for the dynamic system (Johnson, 2009). Because a system could potentially settle into almost any outcome or location in the state space over time, it may be tempting to think that all of the state space qualifies as an attractor state. However, even extremely complex systems fall into a finite number of typical dynamic outcomes or patterns due to their propensity to self-organize (Jost, Bertschinger, & Olbrich, 2010).

4.5 Complexity Theory as a Conceptual Framework for Research

Variability is at the heart of CT, but because systems contain multiple internal components, each interacting in a unique way with the others, their inherent variation seems to interfere on a basic level with the general usefulness of CT approaches to studying human and social outcomes. The strength provided by CT is its approach to investigating how patterns of the whole have developed out of the interaction of the constituent parts, i.e., how qualitatively new patterns and functions are formed (Larsen–Freeman, 2012, 2013). One inherent quality of researching human phenomena from a CT perspective is the deliberate focus on an outcome as well as the often neglected mechanisms or processes through which the outcome is reached (Haken, 1997; Thelen, 2005). Applied linguistics research using the CT perspective requires researchers to talk in a connected way about both the outcomes and the processes through which those outcomes are reached, and to acknowledge how entwined these are. Fortunately, even extremely complex systems group around literally a handful of dynamic outcomes or patterns as they self-organize (Jost, Bertschinger, & Olbrich, 2010). Because these attractor states are so marked for similar systems, investigating them can offer insights that still have general relevance.

4.5.1 Causality

Causality is a way of conceptualizing the real world and observations about life. The way that scholars in the social sciences think about causality has been heavily influenced by ideas which originate from the underlying Positivist epistemology of the natural sciences—ideas which are frequently transposed onto the social sciences (Byrne, 1998). At its core, this manner of looking at causality concerns expectations that life is ordered deterministically, that it is governed by absolute laws, and that this order and regularity allows inference from the particular instance to the general conditions of existence (Groff, 2008). It relies on decomposing a system into discrete elements or variables, varying them through randomized controlled experiments to understand a system's outcome or behavior and what has caused it, and to predict its future behavior (Gershenson, 2007). The Newtonian assumption that effects cannot occur without specific causes relies on condensed, single-factor explanations of causality rather than diffuse and system-level ones (Jörg, 2011). This is clearly inadequate for the CT paradigm with its concern for open systems and their nestedness, networked links and feedback sensitivity (Morrison, 2012, Radford, 2008). Given that the notion of mono-causality driven by a single causal agent may be characterized as a lazy and dangerous ideology (Mainzer as cited in Jörg, 2011), developing a different logic of explanation is critical to advancing what David Byrne (2009a) has called “the central project” (p. 1) of research: going beyond the purely idiographic without resorting to being radically nomothetic, while still elucidating causation.

How, then, can the notion of causality be reconciled with what is known about complex dynamic systems? The answer lies in developing more nuanced notions of a complex and dynamic causality (Byrne & Callaghan, 2014; Larsen–Freeman & Cameron, 2008a). There is no single rule or principle that governs or determines the makeup, development, or behavior of complex systems (Holland, 1995). This revised causality is *complex* because it is likely to be multivariate, multi-level, and path-dependent; it is *dynamic* because it may involve contingent, co-adaptive processes that are non-proportional. The most uphill task, then, may be in acknowledging that “everything counts” (Thelen, 2005, p. 261) when it comes to how effects are caused. While a complex and dynamic treatment of causality and causal mechanisms remains a conceptual exercise at this stage, below I propose several guiding principles that are broadly applicable to the field of applied linguistics and might allow a more nuanced view of causality:

Multiplicity: Identifying the causes at play for a given outcome is a crucial first step. Note my deliberate use of the plural *causes*. Employing the plural here may have merit, as more often than not there are likely to be a handful of central causative factors along with various peripheral—and in some instances even hidden—ones. Establishing these is a necessary step, but one that is not sufficient on its own (Thelen, 2005). Here, researchers would reference aspects of the system and its context that are most likely to have an impact on, and in turn to be impacted by, the outcome.

Interdependence: Examining the interdependent links between the factors that appear to have causal significance will offer as much insight into the workings of the system’s outcome as determining what these factors are (Larsen–Freeman & Cameron, 2008a). The element-to-element and element-to-context relationships that involve

loops of damping (i.e., negative) and reinforcing (i.e., positive) feedback will allow these causal factors to trigger, interact with, and even counteract each other. Knowing something about these multi-level interdependencies is vital in unraveling the causal threads of a system's outcome (Lewis, 2005).

Hysteresis: The point of departure for a cause may not always be what it appears to be (de Bot, 2015). Hysteresis concerns the system's previous history and that history's influence on subsequent outcomes. This history both provides the initial timeframe which is necessary to begin thinking about causality, and contributes to the expanding picture of how effects come about (Jörg, 2011). The notion of cause is only valid once it is rooted within a timeframe; however, outcomes may not immediately reveal their underlying cause if the source of that cause is a process whose sustained effect has a much earlier inception.

Directionality: Causality is not a static determinant of a system's outcome. Causes and effects can reciprocate in progressive bi-directional cycles where each modifies the other functionally (Byrne & Callaghan, 2014). Thus, these reciprocal and recursive flows of causes and effects add a fourth dimension to how systems come to be what they are, or come to behave as they do (van Geert, 1998). Causes shape effects, which then return the favor and reshape the causes, where each is at once an antecedent and a consequence of the other. The capacity to decipher these cycles is likely to result in completely new ways of thinking about outcomes.

Stochasticity: To compound the above factors, there is also an unpredictable, nonlinear quality to outcomes. This introduces an element of randomness and disproportionateness to how effects come about, often reflected in human behavior which appears to have no immediate effect because the antecedents require time and

persistence before the effect unfolds (Morrison, 2012). Yet another angle to this is the fact that given causes may not always produce the same outcome. In the place of equal and opposite reactions, researchers must think instead of contingent, threshold effects which build up over time until they cascade into one or another outcome (Gershenson, 2007).

4.5.2 Complexity and methodological experimentation

It is apparent from my review of central concepts and notions from complexity, that the project of CT research poses unique problems for researchers: it is in their interest to adopt straightforward methods and designs that allow their phenomena of interest to be operationalized clearly and systematically (Byrne, 2009a). However, a degree of flexibility and pragmatism is necessary to advance the study of complex dynamic phenomena. Experimentation with data collection and analysis techniques that are amenable to CT research is still in the early stages in applied linguistics, and as such researchers should endeavor to be meticulous and well-informed so that every step taken from situating a piece of research in the theoretical background of CT, to recruiting research participants, collecting and analyzing data, and reporting findings, resonates with the principles of CT (Larsen–Freeman, 2012). A handful of research methods for investigating the interactions and effects of complex dynamic systems do exist outside of the hard sciences (Byrne, 2009b; Ragin, 1999a), and acceptance in CT research of multi-methodology and hybrid research designs is increasing (O’Sullivan, 2009). In practice, however, conducting meaningful research from this perspective is still demanding in the social sciences where—given that a qualitative description may be the only one possible—researchers approach complex dynamic phenomena from a

semantic point of view formulating conceptual ideas with a language borrowed from complexity science (de Bot, & Larsen–Freeman, 2011).

Blending research methods is acknowledged as a productive way to produce a more multidimensional understanding of an issue than adhering to tightly prescriptive methods can (Corbin & Strauss, 2015; Yin, 2016), and this underscores the value of triangulation. The methods in particular that have been used widely over the last two decades with CT research in the broader social sciences are case-based methods. Case-based methods are well suited to the exploratory study of complex dynamic phenomena because of their tendency to focus on process by describing the *how* and *why* of a phenomenon (Flick, 2014). However, because it also requires a case unit to be clearly identified for investigation, a case study is equally suited to questions of outcome states and holistic pattern finding (Yin, 2014). Below I examine several case-based methods in turn.

Qualitative comparative analysis (QCA) is a case-based approach to researching complexity that originated in Charles Ragin’s work in sociology (Ragin, 1989, 2009b). It begins with defining the outcome of interest (i.e., sufficiently narrowing down a phenomenon to research it) and casing the outcome (i.e., recruiting a typical sample that will guarantee relevant data about that phenomenon). Adopting the configurational case-oriented research design of QCA means understanding cases in terms of their different combinations of aspects—that is, as diverse “configurations of memberships” (Ragin, 1999a, p. 1225). Developing a causal explanation of an outcome requires a researcher to select the causal conditions. Conditions are roughly equivalent to the term “variables” in more widespread use, and QCA uses the ones and zeros of Boolean algebra to code conditions that are thought to influence a

specified outcome in the cases being compared. In crisp set QCA (csQCA), which is used for discrete variables, all the cases are assigned one of two possible ‘crisp’ membership values for each condition or ‘set’ included in a study: 1, membership in the set; and 0, non-membership in the set.

intpert	extpert	selfpert	learn&memr...	preemptresp	reactresp	perscentral	number	immunity	raw consist.	PRI consist.	SYM consist.
1	1	0	1	1	1	0	2 (50%)		1.000000	1.000000	1.000000
1	1	1	1	1	1	1	2 (100%)		1.000000	1.000000	1.000000
0	0	0	0	0	0	0	0 (100%)				
0	0	0	0	0	0	1	0 (100%)				
0	0	0	0	0	1	0	0 (100%)				
0	0	0	0	0	1	1	0 (100%)				
0	0	0	0	1	0	0	0 (100%)				
0	0	0	0	1	0	1	0 (100%)				
0	0	0	0	1	1	0	0 (100%)				
0	0	0	0	1	1	1	0 (100%)				
0	0	0	1	0	0	0	0 (100%)				

Figure 1. Screenshot of a truth table from QCA data analysis.

Note. Truth tables combine the sampled respondents in rows with a list of causal conditions thought to lead to the outcome of interest in columns. Using Boolean logic, a 1 codes the presence of each conditions for individual participants, while a 0 codes its absence. The conditions in the table above were the codes derived from GT coding of the dataset from my exploratory study. By analyzing the combinations of conditions across participants in the truth table, the researcher is able to settle on a parsimonious minimal formula which offers an empirically robust explanation of the phenomena under investigation.

Part of investigating complex causality using case-based methods is the assumption that the case-set will be large enough to reveal interesting cross-case patterns, while still small enough to allow a researcher to gain an acceptable level of familiarity with each individual case (Yin, 2014). However, in the words of Ragin (1999a) “more cases always means more heterogeneity” (p. 1226). This indicates that as the number of cases in the case-set decreases, there is a corresponding increase in the likelihood that they will share causally relevant conditions. Summarizing case-

specific details in truth table rows (see Figure 1) allows a researcher to determine which causal conditions, or combinations of conditions, are necessary or sufficient for the outcome being investigated. Gradually contradictions are solved and the causal conditions are minimized in order to keep the fewest possible causes that still result in the outcome. Analysis aims to obtain a parsimonious minimal formula that holds for all of the cases being compared; if it does, the consistency (i.e., the number of cases that share this combination of conditions and also display the outcome of interest) is 1.0 the highest score possible (Ragin, 2009a). Perfect consistency is relatively rare as it always requires small-N case sets and may imply that casual conditions have not been determined meaningfully. (Ragin, 1999b).

Process-tracing is a within-case (i.e., single system) method used to explain complex causal mechanisms at a micro-level of granularity. By analyzing “evidence on processes, sequences, and conjunctures of events” (Bennett & Checkel, 2015, p. 7), termed *diagnostic evidence*, process-tracing attempts to identify how and why an intervening causal chain led to an emergent outcome. A versatile method, process-tracing may be quantitative, quasi-quantitative, or entirely qualitative in design. This method has parallels in historiography, and unlike QCA—which also models emergent outcomes—process-tracing relies on microscopic tracing of a dynamic trajectory and examines evidence for competing explanations through a sequence of inferential tests. Process-tracing can progress (a) backward into the system’s context and history, (b) forward into the dynamic mechanisms of change, (c) upward into the network of systems that anchor and interact with the system being examined, and (d) downward into the system’s components, interactions, and parameters to explain complex causal processes for a given outcome (Beach & Pedersen, 2013).

Concept mapping is a theoretically grounded diagrammatic method used for complex-systemic problem solving, i.e., investigating a system's emergent states and dynamic processes of change, and in turn doing something about them. Using thematic clusters, concept mapping produces a spatio-temporal representation of a system and the structural links between clusters. It thus draws on Kurt Lewin's often-cited maxim that "there is nothing so practical as a good theory" (Kane & Trochim, 2007), and is particularly suited for building large-scale, concrete models of systems. More often qualitative than not, concept mapping is firmly focused on the system-level of complex phenomena. Though its primary objective is to serve as the basis for action, it incorporates fewer considerations from the context or systemic networks than other methods discussed here. With an aggregate visual diagram of a system and its mechanisms as the point of departure, concept mapping aims to strategically implement innovations that optimize system functioning in order to solve real-world problems (Moon, Hoffman, Novak, & Cañas, 2011).

Social network methods, similar to concept mapping, use visual matrices (e.g., information maps, sociograms) and add their own sophisticated computational analyses that draw on graph theory. These methods are equally well-suited to exploratory research designs or to hypothesis testing (Kadushin, 2012). Unlike concept mapping, however, social network methods shift their focus more broadly to modeling and analyzing the environment (i.e., the networks) that systems exist in and the relational patterns and implications this interwoven network has on systems (Mercer, 2015). Although social network methods' primary emphasis is on the graphic architecture of the systemic networks, multiple levels of analysis are possible, and these methods do place importance on what this structure can reveal about the

behavior and functioning of the systems within it (Carolan, 2014). For these reasons, systemic networks can also be used to model dynamic processes and to shed light on more micro-level considerations.

Agent-based modeling is a method for building, from the ground up, working models of complex systems and for simulating their dynamic processes and emergent outcomes (Castellani & Hafferty, 2009). This type of modeling is commonly used to investigate the empirically optimum solutions to system behavior and outcomes, especially when actual manipulation of a system or its agents for this purpose presents practical challenges (e.g., due to issues of access or scale). Agent-based modeling is a process often used for solution finding in complex scenarios. Among other steps, it involves formulating a model that is a transformation of an empirical situation, specifying quantitative values and indicators that connect a model and the target system (i.e., parameterization), then assessing, calibrating and scaling a model based on data collection (e.g., using observations, surveys, interviews, or other data-elicitation tasks). By combining heterogeneous sources and levels of data, its priority is on discovering ways to represent the interacting components and experimentally display the emergent properties and dynamic reactions of systems (Siegfried, 2014).

Corbin and Strauss (1990) caution that it is entirely possible to complete a study designed meticulously on the principles of a research methodology and yet produce findings that may be conceptually insignificant or trite, in which case the study fails to satisfy the criterion of usefulness or significance. Evolution of methodology is often an inevitable outcome of those with different academic backgrounds using a research method within their distinct fields (Suddaby, 2006). Methodological rigidity is in fact only likely to limit the usefulness of an approach to

CT research in SLA, especially in the early stage of applying research models or frameworks. To ensure methodological rigor, it is imperative to strike a balance between satisfying existing criteria for a study adopting a particular methodology while allowing for procedural flexibility and pragmatism.

4.5.3 Retrodiction

Perhaps the only method of its kind in applied linguistics, *retrodictive qualitative modeling* (RQM) is an innovative research method proposed by Dörnyei (2014) for investigating how complex, self-organized patterns are juxtaposed with dynamic mechanisms of development. Whereas traditional research might begin by experimentally manipulating or controlling some behavior in order to forecast the outcome that this will produce, RQM reverses this sequence and begins by identifying the outcomes or end-states that exist, and then progresses back to determine the developmental process that brought it about (Byrne, 2010). At its core, retrodiction is a research framework that starts from instances of what is, and works backward to infer how that reality came about, hence the prefix “retro-” in its name. This is in contrast to the analytic method with its variable-centric approach that looks forward and attempts to predict what will be and generate an account of what might happen (Byrne & Callaghan, 2014).

Complexity scholars working in various fields of the social sciences have recommended this retrodictive framework as the preferred alternative to importing mathematical modeling procedures from the complexity feeder sciences (Byrne, 2009b, 2010; Larsen–Freeman & Cameron, 2008a). The practical RQM template outlined by Dörnyei (2014) is made up of step-wise procedures that closely mirror

certain steps which are integral to case-based research methods. In fact, it may be accurate to refer to RQM itself as a case-based method for CT research. Retrodictive Qualitative Modeling is gradually gaining traction in the field of SLA, particularly in studies of L2 motivation research (see Chan, 2014 for an overview of these). Below I describe Dörnyei's (2014) RQM template in greater detail.

- **Step 1:** The initial step involves identifying the critical system outcome(s) or end-state(s) that will be the object of investigation (e.g., an outcome of *democracy*). I have alluded to this in the other case-based methods reviewed above, as RQM is identical in that respect. It is important to remember that these patterned outcomes are finite in number and correspond to the salient attractor states in which a system settles down over time (concepts I have discussed in preceding sections of this chapter). The methods used to select the outcome of interest may range from traditional focus groups to survey data that is cluster analyzed.
- **Step 2:** The next step requires the purposive sampling of individuals or cases which are typical of the established outcomes or are prototypes of a pattern—think here, for instance, of countries or governments typical of the *democratic* outcome. Data collection that allows detailed description and elucidation of these prototypes follows, and often is accomplished through a series of in-depth semi structured interviews that aim to reach saturation in the data.
- **Step 3:** The final step incorporates data analysis and interpretation. First, from the data collected, the underlying components of the system must be identified and described—what, for example, makes *democratic* nations unique from

other models of governance. Following this, the unique signature dynamics must be traced to allow an understanding of how the individual or case ended up in the outcome they are a prototype of—here again a researcher would attempt to unravel the process by which a country becomes *democratic*.

While it is still too early since its introduction to the field of applied linguistics for RQM to have been widely adopted, because it is predicated on the logic of complexity—namely, that working backwards from outcomes can assist in pinpointing the dynamic and situated processes that led to particular state—it provides a highly promising and relatively rigorous way of doing CT research.

4.6 Conclusion

In many of the social sciences—not least in education—complexity has become de rigueur (Castellani & Hafferty, 2009; Davis & Sumara, 2006; Morrison, 2008). The purpose of the current chapter was first to clarify some of the most central aspects of complexity theory, providing definitions and explanations of various complexity terms and constructs; and second, to chart out what the CT perspective might entail for a program of social science research (e.g., such as that of applied linguistics and SLA) that strives for compatibility with a complex and dynamic philosophy of science.

I have proposed that complexity is a meta-theory which provides powerful conceptual tools for investigating complex outcomes and dynamic patterns of change. Much more than just a fashion statement or a bandwagon, complexity theory serves as a rigorous aid to thinking and theorizing about social phenomena that represents a

challenge to conventional methods of scientific thought. CT is inherently welcoming to most research methods and techniques, provided that they are congruent with its principles of reality and principles of knowing, and do not contravene the assumptions necessary for scientific investigation of that complex and dynamic reality (Mason, 2008). My discussion of CT as a conceptual framework for research was linked also to current experimentation with various case-based, and often qualitative, research methods for complexity science.

My objectives for reviewing a handful of methods (such as QCA and RQM) were to showcase how some of the methods that I will employ in my own research below link to CT, and to better contextualize the practical result of such central considerations as (a) which subjects or phenomena might be chosen for study, (b) the type of questions which might be explored in relation to these subjects, (c) how empirical research might be designed and conducted, and (d) how results might be analyzed and interpreted. It will be apparent, I hope, that the research methods I outline in the subsequent chapter are premised on these very considerations and assumptions.

5. Method

5.1 Introduction

In this chapter, I describe the methods used in the exploratory study and in the validation studies. These studies were conducted to investigate the professional lives and experiences of L2 teachers in the South Korean L2 classroom context. The design of all studies adhered closely to the *Code of Research Conduct and Research Ethics* outlined by the University of Nottingham, and each stage was independently approved by the Faculty of Arts ethics approval process through paperwork filed with the School of English. Figure 2 provides an overview of the design of these studies.

I first report on the design of the data-based exploratory case study of L2 teachers in South Korea which launched this research project. The exploratory case study (see Hiver, 2015b) was designed as a launching point for this line of inquiry into why some teachers appear to retain their teaching vision and thrive, why others suffer and barely survive throughout their teaching careers, and why even greater numbers still burnout and leave the profession altogether (Bullough & Hall–Kenyon, 2011). Following this, I describe the validation studies, a sequence of three-phases in a follow up study using retrodictive qualitative modeling (Dörnyei, 2014) methods. This validation study was designed to substantiate and extend the earlier findings from the initial case study. Due to the unfamiliarity of RQM, reporting the methods conventionally may not provide a completely coherent research narrative of the methods used. For this reason, I have chosen to outline the information below sequentially, in the phases through which the validation studies progressed. In each of

these phases, relevant information is provided regarding the participants, instruments, and data collection and analysis procedures.

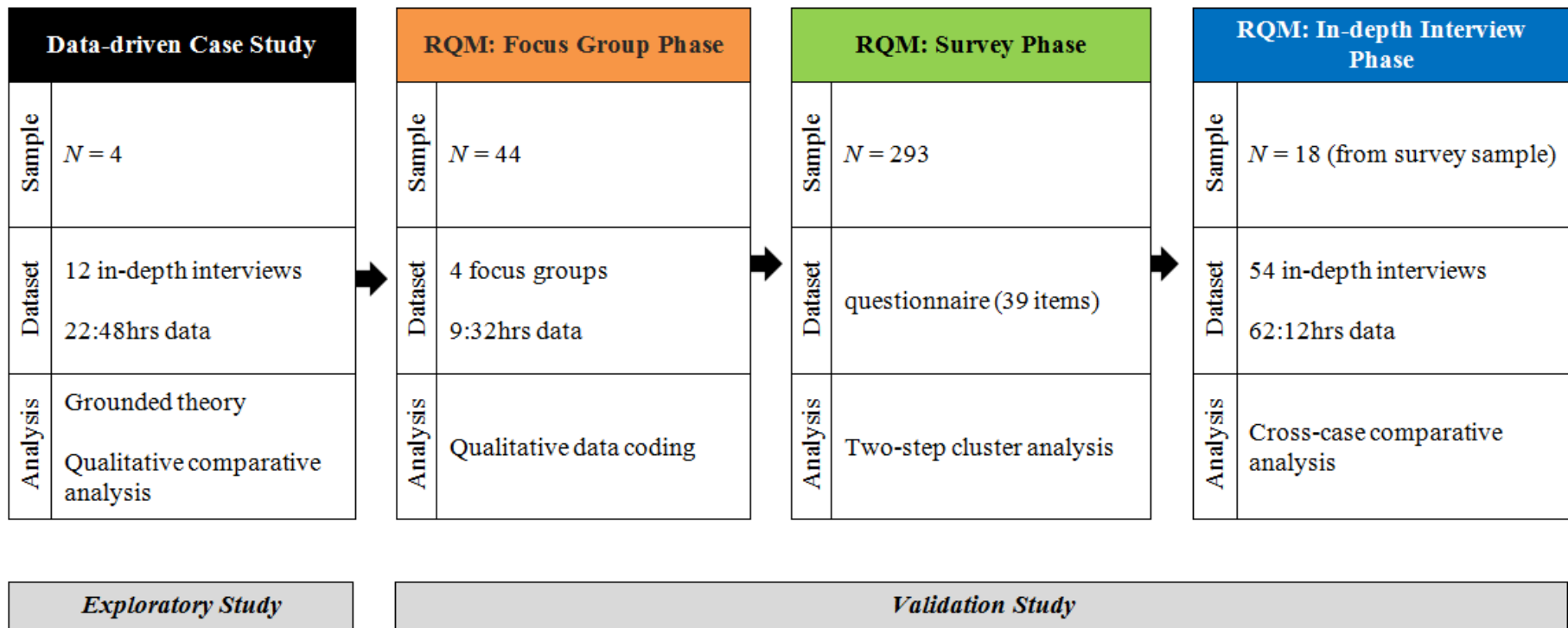


Figure 2. An overview of the exploratory and validation study design

5.2 Research Context

The main research site for this and all subsequent studies was South Korea. Despite its distinctive obsession with education, Korea could be considered somewhat typical of most contexts where second and foreign languages (henceforth L2) are taught (Butler, 2015; Hu & McKay, 2012). Language education takes place in one of two main settings. In the public sector (including all private K-12 schools)—where at least one L2 is compulsory from the 3rd grade—L2 teachers are classified as civil servants, recruited centrally by the Korean Ministry of Education, Science and Technology (MEST), tightly regulated with regards to curricular objectives and instructional content, and tasked with the preparation of students for national L2 examinations that carry significant weight in students' success in school and later life (Park, 2009; Song, 2011). In the private sector, however—where expenditure on L2 education alone is estimated to account for a staggering 1% of the annual GDP (i.e., roughly \$15 billion) (KOSTAT, 2015)—L2 teachers come under the auspices of the Ministry of Employment and Labor, resulting in the more or less unregulated recruitment and certification of L2 teachers (which makes it nearly impossible to estimate numbers meaningfully) that is dictated more by market competition and demand for particular languages or types of language preparation (e.g., L2 exams for employment) (H. Kim, 2015).

In the K-12 sector, secondary school L2 teacher education takes place—as with all other subject teachers—predominantly in one of three different programs (MOE, 2013): (1) colleges of education (there are 40 of these nationwide), (2) teacher preparation programs linked to a major taught in general universities (134 nationwide), and (3) graduate schools of education (126 nationwide). Obtaining a teaching

certificate from one of these three programs of secondary teacher education, however, does not guarantee a position as a teacher (H. Kim, E. Kim, & Han, 2008). Candidates have to pass a competitive multi-stage licensure examination before they are officially employed by a metropolitan or provincial board of education and allocated a teaching position. On the other hand, primary school teachers are trained exclusively at one of 12 national universities of education (Coolahan, Santiago, Phair, & Ninomiya, 2004). These candidates too must sit an open, competitive exam for their teaching license, but due to greater oversight of admissions quotas, and the entire final year of their degree being dedicated to a program of exam preparation, the majority of graduates from these national universities of education do end up being hired as primary school teachers. One of the weaknesses of Korean K-12 teacher policy, however, appears to be the lack of systematic support for teachers' ongoing professional development. Recent reviews rank Korea lowest among the 14 countries surveyed on this measure (J. Lee, 2002). This may appear ironic given that higher level qualifications, obtained through professional development, are required to reach a higher teacher status or for promotion to administrative positions (there are 40 such steps in the promotion scale) (Seo, M. Kim, & Jeon, 2005). However, this has encouraged promotion-oriented in-service education (i.e., taking professional development courses merely to accrue promotion points) which some argue has distorted the concept of in-service teacher education.

Despite the relative stability of a career in K-12 language teaching in Korea, and compensation comparable to other white collar occupations, one of the main criticisms of the current system is the lack of a clear definition of the key tasks and roles for teachers in schools (Joo, 2008, Song, 2012). Regular teachers in Korean K-

12 classrooms undertake numerous other duties in addition to their core instructional duties, such as advising students, participating in school management, processing paperwork and administrative documents, and consulting with parents. This gives rise to an excessive broadening of the tasks performed by teachers, and risks introducing unevenness in teachers' workloads as many of these tasks are not undertaken on a voluntary basis (J. Lee, 2002). Language teachers are no exception to this, and often shoulder the heaviest load with homeroom teacher duties and extracurricular responsibilities. The issue of teacher evaluation also occupies a prominent position in policy debates, with the MEST, parents' organizations, and the public in favor of utilizing these to identify ineffective teachers and improve their capability, while teachers' unions are resistant to what they see as other stakeholders' attempts to use subjective evaluations as grounds for the dismissal of ineffective teachers (E. Kim & T. Lee, 2005). Since the organizational structure within schools is hierarchical, and often based more on years of service than other measures of performance, there are inadequate opportunities built in to institutional settings for novice teacher support and ongoing mentorship or collaboration programs. Additionally, while there are several formal mechanisms in place designed for reflection and improvement of teaching practice, such as periodic open classes (i.e., classes in which teachers are observed by parents, colleagues, and superiors), others argue that teachers' involvement in these initiatives is mostly driven by potential promotion and thus no real improvement in teaching is observed (E. Kim, J. Kim, & Han, 2009).

Finally, one rather dramatic characteristic of teaching unique to Korea is what has been termed the "Korean paradox" (Park, 2009). The Korean zeal for education (private education in particular) is widely acknowledged—e.g., Seth (2000) coined

the term “educational fever” to describe the Korean obsession with education. This obsession is partly a function of the competitive structure of Korean society which renders educational success a key to success at all stages of life and in all areas of society (Y. Choi & H. Kim, 2008). The remarkable achievement of Korean students, particularly their results on competitive international assessments such as PISA (in which Korean students rank in the top four worldwide for excellence and equity) (OECD, 2014a, 2014b), suggests that in terms of quality Korean teachers represent one of the best teaching forces in the world. This is partly borne out in key statistics which show that new teacher recruits score in the top 5 to 10 percentile on the national college entrance exam (E. Kim, 2007). However, despite these notable successes there is also an overwhelming public undercurrent of dissatisfaction with the quality of teachers, with many parents and policy makers discrediting teachers as the major contributor of such good results on international assessments (M. Lee, 2008). In one recent poll conducted by the Korean Educational Development Institute (KEDI) only 22 percent of respondents, all of whom were parents of school-aged children, replied that teachers were doing their jobs effectively (I. Kim, 2006). This, then, is the Korea paradox: students in Korean public schools achieve outstanding results in all the learning domains measured on international tests (OCED, 2014a, 2014b) and the teachers themselves have some of the strongest academic backgrounds, but parents, students, and policymakers express severe dissatisfaction with teachers and the quality of education being received, to the point that many choose to opt out of the system and “defect” to alternative schools domestically or abroad (E. Kim, J. Kim, & Han, 2009).

While in some respects L2 teachers in the K-12 sector in Korea work within a unique institutional structure, there are shared conditions and characteristics that many in teacher education and education policy will immediately recognize. In this context L2 teaching is a demanding and critical profession which occurs in increasingly diverse K-12 classrooms. The complex, challenging conditions particular to teaching in this setting stem partly from the fact that L2 subjects are compulsory subjects taught in large, mixed-ability groups; there is a general lack of support and teacher autonomy, mirroring the teaching professional at large, which is coupled with increasingly stringent and unpredictable measures of accountability and mandated assessments of effectiveness. Complicating matters is the emotion labor inherent to teaching more generally that often undermines teachers' professional self-worth and well-being. The predictable result of these structural conditions is that Korean L2 teachers, like many others worldwide, struggle to build confidence, develop feelings of effectiveness and self-reliance, and thus remain susceptible to stress, burnout, and dysfunction.

5.3 The Exploratory Study

Naturalistic research designs require the qualitative researcher to act as the human instrument of data collection and sense-making by observing, describing, interpreting, and experiencing settings as they are. This is why qualitative research often features an emergent architecture rather than a predetermined one. Given the exploratory nature of this initial study, I began with the following broad research question:

RQ1: What are the qualities (with regards to motivation, cognition, and emotion) that set apart L2 teachers who are engaged, well-adjusted, and productive from L2 teachers who struggle to survive?

5.3.1 Participants

Four L2 teachers, all in the 35 – 50 year-old age bracket, participated in this study. Because I intended to include teachers from the three different strata which make up the most typical language teaching situations in South Korea (Coolahan, Santiago, Phair, & Ninomiya, 2004)—the private sector, the public K-12 sector, and tertiary education—these four teachers differed in age, length of service, and classroom context. Due to the exploratory nature of this study, I drew on my own experience and intuition in casing teachers that I have known and worked closely with for close to seven years in Korea. All four teachers reported a consistently high level of professional satisfaction and commitment; they displayed high levels of well-being and resistance to stress, failure, and burnout; and they expressed confidence in the quality of their instruction and the performance of their job-related responsibilities. Below is a brief introduction to these individuals; all names are participant pseudonyms.

Hanna (50) is the most experienced of the four and has been teaching language or training L2 teachers in the public and private sectors for over two decades. At the time of the study she was completing a PhD in applied linguistics. While her first language is Korean, she is multilingual and has lived and worked for extended periods in several countries worldwide. Hanna has a unique mix of

professional responsibilities, and her role as a teacher-trainer often requires her to deal with a variety of administrative duties.

Yumi (42) teaches English in a large public middle school in a blue-collar, urban area of Korea and has close to 15 years of teaching experience in public secondary schools. She took the teacher certification exam immediately after graduating from university and was just finishing an MA in TESOL as this study took place. The vast majority of other L2 teachers in Korean public schools are likely to have followed a similar path into the profession as Yumi, with very few distractions or breaks along their path into teaching.

Soojin (39) became an English high school teacher relatively late, and has just under a decade of language teaching experience. Unlike most public school L2 teachers in Korea who majored in either the L2 or in education and then passed the teachers' licensing exam in order to immediately begin teaching, Soojin dropped out of college on a whim and went to live with her distant relatives in North America for a short time. She then began a career in corporate real estate, but despite several successful years in sales, she became dissatisfied and ultimately returned to college where she very quickly gained the qualifications needed to become an English teacher in the public sector.

Wilbur (35) began teaching English in Korea in the early 2000s in order to be nearer to a close friend who had also expatriated to Korea. Wilbur has a graduate degree in education and spent some years in L2 teacher education for the Korean Ministry of Education Science and Technology (MEST) before transitioning into teaching credit-bearing L2 classes at a medium-sized private university in a suburban area of Korea. As this study got underway, Wilbur was in the process of converting

his language teaching qualifications into the credentials needed to become a licensed teacher in his home country because he and his wife planned to move back in the near future.

5.3.2 Procedure

Data for the exploratory study were collected through multi-session, in-depth, semi-structured interviews with these four participants. Each participant had three roughly 90-minute, one-to-one interviews which took place in the spring and summer of 2012 (see Table 1 for a summary). A mind-map was drawn up before each interview to identify topics for exploration (Wheeldon & Faubert, 2009), and rough questions (see Appendix B) were scripted from this during the interview (Rubin & Rubin, 2012) (e.g., *What do you do to hold yourself together on a bad day or when things go wrong? What are some common issues or difficulties or challenges that language teachers generally face?*). Interviews were conducted solely in English, per the participants' preferences, and conducted with the informed consent of the participants (see Appendix A). The interview data were concurrently transcribed and analyzed as they were collected in order to feed into subsequent interviews (Yin, 2016).

Table 1. Summary of Exploratory Study In-depth Interviews

Teacher	Location	Interviews	Length (in hours)
Hanna	site 1	3	05:16:32
Yumi	site 2	3	06:01:10
Soojin	site 2	3	04:45:39
Wilbur	site 3	3	06:27:48
Total		12	22:48:35

5.3.3 Data analysis

Bottom-up analysis: Grounded Theory

Qualitative analysis is predominantly inductive in nature, with deliberate thought being given to both idiosyncrasies and commonalities, and agency is pivotal in an expressive sharing of qualitative findings. The first stage of data analysis followed the Grounded Theory (GT) sequence of open coding, focused/axial coding, and selective coding (Bryant & Charmaz, 2007) using NVivo 9 qualitative data analysis software. Memoing, which is a core activity during GT data analysis (Bazeley & Jackson, 2013), took place simultaneously to coding to write up ideas about the codes' meanings and their relationships. During open coding, the more than 22 hours of interview data were coded segment-by-segment in gerunds to gain a strong sense of action and sequence (Charmaz, 2014). Axial coding followed the schematic categories of 1) conditions, 2) actions and interactions, and 3) consequences (Corbin & Strauss, 2015). During selective coding, the extensive memos written previously were used to integrate nodes around the emerging concept

of *teacher immunity* (Richards, 2015). Regarding the methodological concern raised by van Geert (1998) as to “whether the observed trajectory has been sampled frequently enough to reconstruct its internal dynamics” (p. 155), saturation (Yin, 2014) was reached fairly rapidly because of the typical sampling used in conjunction with the data collected iteratively from in-depth, semi-structured interviews. Signals of this included repetition of information within and across individual data sets, and gradual confirmation of emerging conceptual categories during coding and memoing (Strauss & Corbin, 1994).

Top-down analysis: Qualitative Comparative Analysis

QCA was used as a follow-up, top-down procedure of validation to confirm the reliability of findings from the first stage of data analysis. In order to mirror the earlier GT analysis, the independent variables used for the input conditions in computing the csQCA truth tables (see Figure 1) were factors that had come out from the GT data coding procedures (e.g., experiences motivational disturbances). This stage of data analysis borrowed the following steps from Rihoux and Lobe (2009):

- defining the outcome of interest;
- selecting the causal conditions;
- truth table exploration;
- minimization;
- interpretation;
- generalization.

For this stage of analysis I used the QCA software package QCA 3. I first applied the *Truth Table Algorithm* for crisp set analysis. Because the parsimonious minimal formula was obtained in the very first instance (i.e., the data showed exceptional definition), a further crisp-set analysis of the model was run using the *Quine-McKluskey Algorithm*, a complementary algorithm designed to streamline the causal conditions. Solution coverage of the model's configuration was 1.0 (i.e., perfect coverage) while the solution consistency was also 1.0 (i.e., perfect consistency). There were no causal contradictions to solve, no logical remainders that could be omitted, nor prime implicants that could be further minimized. While it would be atypical to get such results with an intermediate-to-large-N case set, the invariance of the causal conditions linked to the outcome can be attributed to the uncharacteristically small-N sample selected through typical sampling. Part and parcel of investigating complex causality using case-based methods is the assumption that the case-set will be large enough to reveal interesting cross-case patterns, while still small enough to allow a researcher to gain an acceptable level of familiarity with each individual case (Duff, 2008; Yin, 2012, 2014). Ragin (2006) cautions that as the number of cases in the case-set decreases, there is a corresponding increase in homogeneity which may complicate the task of meaningfully determining causal conditions. Although QCA is seldom used with extremely small-N case studies, I hoped to use it in this study to establish causality from the qualitative data collected.

5.4 Validation Study Phase I: Focus Groups

The research questions guiding this study were as follows:

RQ1: What are the prototypical outcomes (i.e., attractor states) in which language teacher immunity manifests itself?

RQ2: What are the salient characteristics (i.e., system components) of each language teacher immunity prototype?

5.4.1 Design

The initial exploratory study established that language teacher immunity might manifest itself in one of three global types: unimmunized; immunized-and-rigid; immunized-but-flexible. However, the precise prototypes that teachers develop into were as yet unexplored. Thus, the first stage of validation was dedicated to identifying specific sub-types within each of these global types. Retrodictive Qualitative Modeling (RQM) (Dörnyei, 2014), is one of the few research frameworks in existence that is well-suited to the investigation of complex dynamic outcomes such as these. The RQM methodology is explicit about the importance of adopting salient patterns and outcomes (i.e., prototypical cases) in a given domain as the point of departure for any investigation, and for this reason I chose to begin the RQM sequence with focus group discussions. This method of eliciting contextually grounded data allows for both diversity and consensus in the data that can help guard against imposing readymade categories that would limit the depth and breadth of analytical insights. The data collected in the 4 focus groups were intended to highlight a range of components that would allow me to build prototypes of the most salient sub-types of language teacher immunity. To ensure that these focus groups were descriptively rich and free to take their own shape, lines of enquiry were only explored when the

opportunity arose within each respective group. I endeavored to create appropriate space for all the participants to express themselves freely, and many of these teachers explicitly stated that they had discovered something new about themselves too while participating in the focus groups. Thus the perceived value of these focus groups for the individuals involved could be seen in terms of empowerment, validation, acknowledgement, greater self-awareness, and in reconstructing their own sense of worth.

5.4.2 Participants

Forty-four language teachers (K-12) with experience ranging from three to 23 years were recruited from differing teaching contexts in South Korea. Each of the four focus group discussions was conducted with a small group made up of public/private school English teachers (focus groups 1, 2, and 4), or teacher trainers and school administrative faculty (focus group 3). Maximizing between-group heterogeneity in this way provided optimal breadth and depth of data (see e.g., Corbin & Strauss, 2015). Sampling the 44 participants that made up these four focus groups was opportunistic in the sense that the decision to include each subsequent group was made more or less spontaneously as a way to follow new leads and expand on prior focus groups (Rubin & Rubin, 2012). To some extent, however, this sampling decision was also purposive as I intended to use a form of segmentation that permits within-group homogeneity and inter-group heterogeneity of participants (Miles, Huberman, & Saldaña, 2014). These professionals were invited to participate voluntarily in the focus group discussion at a time and place convenient to them. The 44 individuals sampled for these four focus group discussions took part voluntarily

and were not compensated for their participation, but they nevertheless expressed a ready willingness to share their opinions on the topic of discussion. In some respects it appears that their being called upon to “act the expert” and expound on the state of being a L2 teacher in general appealed to their sense of ego.

Focus Group 1

The participants in focus group 1 were a group of 11 Korean public school secondary English teachers (5 men and 6 women) that had all met each other during their initial pre-service teacher training at college. Each with just over a decade of experience, they had all stayed in touch with each other and had met regularly, albeit informally, over the first decade of their teaching careers. This is not uncommon in the Korean public school sector, with links forged in teacher training college likely to last the span of a teacher’s career. The names of these teachers were unknown to the researcher as they were approached by a third party to participate in the focus group discussion led by me.

Focus Group 2

Focus group 2 consisted of nine Korean public school elementary English teachers. There was only one male in this group, and this is likely due to the overwhelming majority of educators in Korean primary schools being female. The teachers in focus group 2 were approached to participate on the last day of a three-week-long in-service teacher training program they were taking during the school break. While most elementary school teachers in Korea teach every subject in the curriculum to a single homeroom class, the individuals in this group were English

subject-teachers who specialized in teaching only English in their schools. Years of service in the profession ranged from three years to 17 years.

Focus Group 3

The make-up of focus group 3 was somewhat unique, with individuals that differed significantly from the others. While the participants in all the other focus groups are currently language teachers, four out of the six participants in focus group 4 are teacher educators at a national institute of foreign language education. These four participants each have an average of 15 years of experience in teacher education and estimate that in this time they have met, trained and mentored a combined 5,000 primary and secondary L2 teachers—teachers that are likely similar to those who made up focus group 1, focus group 2, and focus group 4. The two remaining participants in focus group 3 began their careers as public school English teachers more than 20 years ago, and are now administrators in supervisory roles at secondary schools and members of a regional teacher certification board.

Focus Group 4

The fourth and final focus group was composed of 18 language teachers, all enrolled in a class on language teaching pedagogy in a graduate degree program that I was teaching on. There were five male and 13 female teachers in focus group 4, roughly half of the total were employed in the private sector as language instructors at test prep academies or private educational institutes, while the other half were public school English teachers. The range of teaching experience in this group varied from

three years to 23 years. As part of the same cohort of graduate students, these teachers had known each other for just under a year.

5.4.3 Procedure

Apart from four of the focus group participants, all were L1 speakers of Korean, but when asked about their language preferences for the focus group all individuals said they preferred to use English in the discussion. The focus groups were all conducted in English and took place during the winter of 2013 and spring of 2014. Each focus group was audio recorded with the signed consent of the participants (see Appendix C). The four focus group discussions differed slightly in length, were held in different locations, and used a range of techniques to elicit data from the participants involved (Bloor, Frankland, Thomas, & Robson, 2001). Table 2 provides a summary of this information. Focus group 1 (2 hr 9 min) was held in the teachers' office in a secondary school located in the greater Seoul area; this was the location designated for regular teachers' reunion meetings by this group. Focus group 2 (1 hr 46 min), on the other hand, took place in a small unoccupied classroom that these teachers had been using as a private study area. A school lounge in the institute of teacher education was where focus group 3 (3 hr 17 min) was held, while focus group 4 (2 hr 20 min) took place in a medium-sized auditorium.

The technique used in both focus group 1 and focus group 2 was the default round table discussion (Puchta & Potter, 2004). Chairs formed a closed circle that put all participants and the interviewer on an equal seating arrangement with the potential to maximize eye-contact and group interaction. In my role as the interviewer I facilitated the discussion, inviting all participants to comment on the topic under

discussion, and asked open-ended questions to explore leads that arose in the interview (see Appendix D). I began with a brief preliminary warm up to establish a non-threatening environment and put the focus groups at ease, and participants were also given guarantees of confidentiality and anonymity. Then by listing well-known causes of teacher burnout and attrition, eliciting whether the teachers had ever experienced these personally, I segued into my interest in exploring how teachers survived the inevitable pressures of their profession. For each of the three global types of teachers identified in the initial exploratory study, participants were asked to list types or personas of teachers (hereafter *prototypes*) they had encountered or observed, and to provide each with a descriptive name. Participants were immediately able to identify prototypes they had encountered that corresponded closely to each of the three global types—unimmunized; immunized-and-rigid; immunized-but-flexible. Individuals then described these teacher types and elaborated on them. This was done by asking the participants to speculate about these prototypes in five broad, complementary categories (see Appendix D):

- what these teachers *think*, specifically with regards to their teaching philosophy and reasons for entering the profession;
- what they *believe*, meaning how they see themselves and others, and their attitudes about the world around them;
- how they *feel*, focusing on the emotions they experience and their affective dispositions or orientations;
- what they *do* and why, namely how they approach conflict and what they do in response to significant adversity in their professional lives;

- and finally what they *want*, here relating explicitly to the motives for specific aspects of their behavior as well as their underlying drive to remain a teacher.

It quickly became clear from the data elicited in focus group 1 and focus group 2 that there were many nuances or seemingly contradictory aspects inherent to the characteristics elaborated by the participants. For instance, the consideration was raised regarding whether a teacher can be demoralized, broken and defeated while at the same time also being highly narcissistic and conceited. Thus, I decided to return to the focus group technique that Dörnyei (2014) advocates in the first phase of RQM—building prototypes through open-ended elicitation (Bloor, Frankland, Thomas, & Robson, 2001). I began focus group 3 similar to the two previous discussions by listing some of the commonplace adverse conditions teachers are subject to. Given that the six participants in focus group 3 had trained, mentored, evaluated, or otherwise supervised approximately 5,000 language teachers in their combined years of experience I asked them to list common teachers prototypes that suggested themselves, to give each a creative name of their own choosing (e.g., “The Drill Sergeant”; “The Fixer-Upper”; “The Performer”; “The Free Bird”; “The Imitator”; “The Man Child”), and to think of one real-life example of each they had actually met who stood out in their mind. Because this elicitation technique was entirely open-ended (Rubin & Rubin, 2012), initial brainstorming resulted in no fewer than 20 teacher types. Using the real language teachers they had in mind that embodied each type, participants were then asked to clarify the singularities of each type and, where appropriate, to specify commonalities. As they were not explicitly intended to overlap with the five verbs (i.e., *think*, *believe*, *feel*, *do*, and *want*) used in focus group 1 and

focus group 2, building up the aspects of each teacher type led to much broader ranging characterizations of their:

- attitudes towards and about teaching;
- methodological practices and approaches;
- interactions with students and colleagues;
- ways of coping with stress and burnout;
- affect and self-beliefs;
- time perspective and openness to change;
- motivational orientation and possible self-images.

These first three focus group discussions provided such a wide range of teacher types and characteristics for each that some overlap and redundancy was inevitable. In order to aid in narrowing down the core subtypes of each teacher immunity outcome, and partly because of the high number of participants involved, focus group 4 was designed based on a pyramid discussion task—a task commonly used to stimulate collaboration in a classroom setting. During a lengthy class session related to language teachers and their role in the success of L2 learners, the individuals in focus group 4 were given the following written prompt (Figure 3) by the researcher and asked to think about it individually for around 5 minutes and take notes if necessary:

Task:

Think about the stressful experiences and factors which many language teachers encounter throughout their careers (e.g., learners with academic and personal challenges; pressure from parents and administrators; inadequate language proficiency; a heavy work-load; inadequate support for non-teaching tasks; restricted autonomy, etc).

Brainstorm and list some teacher types, profiles, or personas that are typical examples of how teachers cope with these experiences and factors (e.g., a teacher who seems fossilized and resists all methodological innovation).

Figure 3. Focus group written prompt

The participants were then asked to “pyramid” to a pair. Working with that peer, they shared the types and representations of each type they had come up with individually. In this and each subsequent “pyramid” step the participants were asked to look closely for overlaps and redundancies and to combine, eliminate, or establish new teacher types (e.g., “The Space Cadet”; “The Challenger”; “The Pushover”; “The Martinet”; “The Salary Man”) as they felt appropriate. Participants progressed every five to 10 minutes to a new pyramid level: first from 18 individuals to 9 pairs, then on to six groups of 3, up to three groups of 6, then to two medium-sized groups of 9, and finally into one large group of 18 for the actual focus group discussion. In the discussion proper, the participants shared the types they had constructed and deliberated over any apparent ambiguities. This focus group was particularly enlightening as it proceeded through several iterations where the researcher asked for explicit clarification on what the key differences and similarities might be between available teacher types.

Table 2. Summary of Focus Group Participants and Technique

Focus Group	Participants	Location	Length (in hours)	Technique
focus group 1	11	teachers' office	02:09:00	round table
focus group 2	9	classroom	01:46:00	round table
focus group 3	6	school lounge	03:17:00	structured elicitation
focus group 4	18	auditorium	02:20:00	pyramid
Total	44		09:32:00	

5.4.4 Data analysis

Because the focus group interview data were collected primarily to provide initial ideas regarding prototypes of teacher immunity, these 9 ½ hours of recorded data were roughly transcribed for analysis. The data from all four focus group discussions were first imported into NVivo 10. I began by designating a case node for each teacher prototype included in the dataset (Richards, 2015). These 27 teacher types were then elaborated by coding and categorizing the full range of characteristics participants had described into each of these cases (Saldaña, 2015). Following this I subdivided the prototypes into global, superordinate teacher immunity outcomes. This analysis confirmed the initial macro categories of:

- (a) immunocompromised teachers who have not developed any form of teacher immunity;
- (b) productively immunized teachers with a robust yet healthy form of teacher immunity;

and, (c) autoimmunized teachers with a rigid and counterproductive form of teacher immunity.

However, it also highlighted two additional “halfway types” for (b) and (c) that corresponded to a partly productively immunized teacher who has developed a halfway form of the flexible and beneficial form of teacher immunity, and a teacher who is halfway autoimmunized and on their way to developing the fully-fledged detrimental form of teacher immunity.

Using the 3 global categories + 2 halfway categories as the superordinates for all potential teacher types, I inspected each existing prototype for classification into one of these 5 global categories. In this stage I cross checked for overlapping types and redundancies in the descriptive characteristics, either combining or eliminating these in order to settle on a narrower list of almost universal teacher prototypes that fit unambiguously into one global category (Bazeley & Jackson, 2013; Flick, 2014). Once these were synthesized into a list of 9 core prototypes, I returned to the specification of their features to ensure that key characteristics that appeared imperative to each type were included. It was here that I began to look ahead to the following phase of the RQM design. One primary purpose for the focus group data was to inform the construction of a questionnaire that would be administered to a larger sample of L2 teachers and used to triangulate the findings of the focus groups (see Gubrium, Holstein, Marvasti, & McKinney, 2012), thereby ultimately increasing the overall reliability and validity of the prototypes built in this first phase of RQM. This was done by examining the background literature and drawing parallels with relevant constructs that contributed to a more theoretically-grounded description and

classification of each teacher subtype. The constructs used in this part of the analysis included:

- Self-efficacy;
- Affect;
- Resilience;
- Hardiness and Grit;
- Locus of Control;
- Confidence and Optimism;
- Motivation and Self-determination;
- Stress and Burnout;
- Satisfaction;
- Coping behavior;
- Time orientation;
- Openness to change;
- Mental imagery.

All the existing descriptive phrases and individual characteristics were coded into these theoretical constructs to highlight the main differences or similarities between the 9 core teacher prototypes and provide a theoretical rationale for the construction of a questionnaire designed to corroborate these 9 prototypes in a relatively larger sample of teachers.

5.5 Validation Study Phase II: Survey

The objective of this study, closely following from the previous phase of validation, was to investigate the questions below:

RQ1: Do the phenomenological manifestations (i.e., the prototypes) identified in validation study I correspond with actual teacher immunity archetypes in a sample of L2 teachers?

RQ2: What are the salient characteristics (i.e., system components) of each corroborated language teacher immunity archetype?

5.5.1 Design

The main purposes for triangulating the qualitative focus group data in this study with quantitative survey data was in response to the concern over indefinite variation in potential outcomes for complex dynamic phenomena (Dörnyei, 2014). Arguing that in a group of 100 language teachers there are roughly 100 idiosyncratic teacher types is unlikely to add very much insight about the phenomenon of teacher immunity that is meaningful. However, provided that a relatively limited range of salient outcome patterns can be identified through this two-step technique that progresses from focus groups to cluster analysis, it is likely that these will be salient in many L2 teaching contexts so as to be almost instantly recognizable and common sense to even the average layperson. Cluster analytical methods are used for identifying homogenous groups of objects, cases or individuals, and classifying them

into groups called clusters. They have thus been suggested as a useful way to bridge the gap between ideographic and nomothetic approaches (Uprichard, 2009). Halkidi et al. (2001) provide an overview of the most common-place applications or uses for cluster analytic methods that include, among others, hypothesis generation and testing about the dataset and sample available. The basic premise of this method is that objects, cases or individuals grouped in a particular cluster share many characteristics, but are dissimilar to cases not belonging to that cluster (Dolnicar, 2002). However, because it is no stronger than the classifying principles chosen, experts caution against simply applying a particular cluster analysis procedure to a data set and accepting the solution at face value (Everitt, Landau, Leese, & Stahl, 2011).

A first step for any cluster analysis procedure is to decide on the characteristics or clustering variables that will be included in the analysis and used to segment the respondents. Once this is done the clustering procedure can be chosen. Clustering procedures fall roughly into one of several types: hierarchical, k-means, and a combinatory (i.e., two-step) approach. With statistical software such as SPSS, this corresponds to three possibilities each with a specific purpose (Tabachnick & Fidell, 2007). Hierarchical cluster analysis (HCA) is a procedure used to either agglomerate or partition low-dimensional datasets (i.e., those that include a limited combination of clustering variables) and smaller-size samples (e.g., 100 participants or less) in order to explore naturally occurring patterns in them. HCA often begins with each case as its own cluster, and gradually merges cases based on their similarity, establishing a hierarchy of clusters—often called a “cluster tree”. Alternatively, it may begin with all cases under as single cluster and gradually partition them based on a distance or similarity measure. K-means cluster analysis, on

the other hand, is used to segment a very large number of cases (i.e., samples that are in the thousands and above) into a predetermined number of groups whose characteristics are as yet unknown. It uses within-cluster variation as a measure to form homogenous clusters, iteratively segmenting the data in such a way that the within-cluster variation is minimized (King, 2015).

A two-step cluster analysis was the procedure chosen for this study because it combines the two algorithms above and can be used with high-dimensional datasets and medium-to-large sample sizes. This method uses a distance measure between two clusters which is equivalent to the decrease in log-likelihood function as a result of merging those clusters (Kaufman & Rousseeuw, 2005). The two-step cluster analysis procedure begins by constructing a cluster features tree and pre-grouping cases into an existing cluster or forming a new group using a likelihood distance measure of the similarity of each case to existing clusters. Cases are assigned to the cluster that maximizes a log-likelihood function. In the second step, using a standard agglomerative clustering algorithm, the analysis produces a range of solutions that determines the best number of clusters to segment the cases on the basis of Schwarz's Bayesian inference criterion (BIC). Using the BIC is one of the most objective selection criteria, because it essentially avoids the arbitrariness that often occurs with conventional clustering techniques (Everitt, Landau, Leese, & Stahl, 2011).

5.5.2 Participants

Respondents in this phase of the validation study ($N = 293$) were all South Korean English language teachers in the public school (K-12) sector. More than two-thirds of these teachers were female (83%), and this reflects the overall gender

imbalance in the teaching workforce in Korea. These teachers were all relatively experienced ($M = 10.45$; $SD = 4.21$), and were all teaching at government-accredited primary ($n = 67$), lower-secondary ($n = 110$), or upper-secondary schools ($n = 116$).

All teachers in the South Korean public school system are government employees, and are required to undergo Ministry of Education-mandated professional development in order to accrue the necessary points that enable teachers to be promoted and progress from lower pay scales to higher pay scales throughout their career. In order to accomplish this, language teachers must all subscribe to Ministry e-learning initiatives (i.e., those that are designed to provide learning content in an online format) which contribute to the accumulation of professional development points. The respondents were recruited from the second largest e-learning professional development website for K-12 teachers in the country in terms of registered users. This e-learning website is affiliated with the Korea Education & Research Information Service (KERIS), a branch of the South Korean Ministry of Education, Science and Technology (MEST) tasked with developing current and future government initiatives regarding education at the national level (see Figure 4).



Figure 4. Screenshot of the KERIS e-learning website

Sampling began with an initial message to approximately 1,800 teachers who made up a group of the most recent users of the e-learning website described above (i.e., registered users who had logged on at least once in the past month). Recruiting language teachers as research participants can be a challenging task given response rates typically in the 7% to 8% range (Hobbs & Kubanyiova, 2008). One particular challenge in recruiting is avoiding self-selection bias. Because it was not possible to anticipate which type of teacher would respond, in order to verify the quality of data I examined the outcome and discovered that participants were fairly systematically distributed along the whole spectrum of teacher types. Of the nearly 1,800 language teachers contacted, 293 completed and returned the online survey by the date requested. There was no respondent attrition from this final sample of 293 Korean K-12 English teachers.

5.5.3 Instruments

A questionnaire was developed for the present study by closely examining theoretical considerations from the analysis of focus group data, and collecting multiple published measurement instruments for seven constructs. Only constructs that appeared to be an unequivocal part of the teacher types were included in the questionnaire item pool (see Table 3). An initial item pool was drawn up with 70 items across the seven constructs. The items chosen from existing measurements for each scale listed below were invariably those with the highest factor loadings or highest original measures of internal consistency. This item pool was gradually revised by cross-examining the items in each construct's subscales and preemptively avoiding items that appeared to overlap, measure and/or load on multiple constructs—a time-consuming process given the interrelated nature of all the scales included. To illustrate this dilemma, *coping* effectively with failure is an integral part of the adaptability component of resilience, but it is also a scale itself; *affectivity* often features in burnout because of burnout's emotional exhaustion dimension but it is an aspect of at least two other scales as well. Below I report on these measurements in greater detail. Participants were asked to respond to all statements in the final questionnaire (see Appendix E) on a 6-point response scale (*1 = strongly disagree; 6 = strongly agree*).

Teaching self-efficacy

Teaching efficacy was measured in a seven-item scale ($\alpha = .82$). Five of these items were adapted from the Teacher Sense of Efficacy Scale (TSES) (Tschannen–Moran & Woolfolk Hoy, 2001)—one of the more widely used measurements of

teacher efficacy worldwide (e.g., “When all factors are considered, I am a powerful influence on my students’ success in the classroom.”). The remaining two statements were adapted from the MBI-ES (see Burnout scale below) because their wording was such that they measured effectiveness as an educator (e.g., “I feel I am positively influencing my students’ lives through my teaching.”).

Burnout

Five items measured the construct of burnout in this scale ($\alpha = .80$). Three items were adapted from the Maslach Burnout Inventory–Educators Survey (MBI-ES) (Maslach & Jackson, 1981) and included the aspects of depersonalization and emotional exhaustion that have been shown to account most strongly for burnout (e.g., “I feel that teaching is hardening me emotionally.”). The two remaining items were sampled from the Teacher Stress Inventory (TSI) (Fimian, 1988) in the category of emotional manifestations (e.g., “There are days at school when I feel vulnerable.”). While stress was a scale of its own to begin with, other items in existing measurements all deal with issues that were either judged to be irrelevant (e.g., the incidence of drug and alcohol use) or would result in uniform responses across all participants (e.g., the existence in one’s classroom of demotivated students who have behavioral problems). This scale was designed not to measure whether, and to what extent, stress was experienced but rather the outcome of its accumulation in terms of the burnout profile.

Resilience

There are upwards of 10 various measures of resilience in widespread use worldwide (Beltman, Mansfield, & Price, 2011). Many of these rely on comparable or identical conceptualizations of resilience, and so the items are also very similar if not actual duplicates. For this study, the resilience scale ($\alpha = .82$) included two items from the Connor-Davidson Resilience Scale (CD-RISC) (Connor & Davidson, 2003) and three items from the Brief Resilience Scale (Smith et al., 2008). From Beltman et al.'s (2011) review of the qualities of a resilient teacher I included the following attributes: adaptability to stressors (e.g., "I can get through difficult times because I've experienced difficulty before."), recovery from setbacks (e.g., "It is hard for me to recover when something bad happens."), and efficacy in the face of adversity (e.g., "I feel that I can deal with whatever comes my way.").

Attitudes toward teaching

Teachers' attitudes toward teaching were measured using a total of five items in this scale ($\alpha = .85$). Two items each were adapted from the Motivation at Work Scale (MAWS) (Gagné et al., 2008) and the Job Satisfaction Scale (Macdonald & McIntyre, 1997) respectively, while the remaining item was written by the researcher. Most existing scales measuring teachers' workplace attitudes are designed to assess the respondent's motivational orientation by referencing self-determination theory (SDT) (see e.g., Pelletier, Séguin-Lévesque, & Legault, 2002). This strategy allows researchers to index the type of motivation a respondent identifies with in association to their work responsibilities under the broader categories of intrinsic and extrinsic motives (Deci & Ryan, 2000). However, the purpose of this scale was not to

determine the reasons why teachers were motivated to teach but rather their attitudinal disposition toward teaching and the teaching profession through statements such as the following (e.g., “If I could choose an occupation today, I would not choose to be a teacher.”).

Openness to change

This scale ($\alpha = .74$) was developed for the current study, and measured teachers’ receptivity towards change and novelty in their practice. It is composed of six items roughly adapted from the Openness to Experience scale (McCrae, 1996), a scale that originates from the Five Factor Model of personality (Costa & McCrae, 1992). The openness to change scale here assesses teachers’ capacity for dealing with ambiguity (e.g., “I get impatient when there are no clear answers or solutions to my problems as a teacher.”), flexibility and willingness to accept novelty (e.g., “The ‘tried and true’ ways of teaching are the best.”), and attitudes towards risk-taking (e.g., “I find it hard to give up on something that has worked for me in the past, even if it is no longer very successful.”).

Classroom affectivity

A six-item scale ($\alpha = .81$) was used to measure teachers’ affect and dispositional optimism. Three items in this scale were adapted from the Positive and Negative Affect Scale (PANAS) (Watson, Clark, & Tellegan, 1988), while the remaining three items were adapted from the Life Orientation Test (LOT) (Scheier & Carver, 1985; Woolfolk Hoy, Hoy, & Kurz, 2008). Optimism on the part of teachers generally underscores hope, responsibility, and a general positive disposition to the

profession (Pajares, 2001), and is associated with teachers setting higher expectations, exerting greater effort, and persisting in the face of difficulties. Thus, positive and negative classroom affectivity were assessed through three items each (e.g., “Overall, I expect more good things to happen to me in the classroom than bad.”).

Coping

The five items in the coping scale ($\alpha = .78$) captured the teachers' ability to manage and deal with difficulties. These were adapted from the COPE Inventory (Carver, Scheier, & Weintraub, 1989). Items included in the initial item pool were also sampled from the Coping Strategies Inventory (CSI) (Tobin, Holroyd, Reynolds, & Wigul, 1989), and due to the very close correspondence of items and the dimensions of the subscales in each instrument, I decided to rely on the dimensions from the COPE and borrow the transparent language used in the CSI items when adapting the item wordings. Problem-focused coping (e.g., “When things get really stressful, I try to come up with a strategy about what to do.”) is typically associated with desirable and transformative outcomes. The inability to cope (e.g., “When I am under a lot of stress, I just avoid thinking or doing anything about the situation.”) generally corresponds with behaviors such as repression, denial, self-handicapping.

Table 3. Continuous Variables used for the Two-Step Cluster Analysis

Clustering Variables	Number of items	α
Teaching Self-efficacy	7	.82
Burnout	5	.80
Resilience	5	.82
Attitudes toward Teaching	5	.85
Openness to Change	6	.74
Positive Classroom Affectivity	6	.81
Coping	5	.78

Note. All measures were assessed on a 6-point semantic differential scale from 1 (strongly disagree) to 6 (strongly agree).

5.5.4 Procedure

The final questionnaire (see Appendix E) was composed of a total of 39 items in 7 scales—roughly half of which were negatively coded. The questionnaire was translated into Korean by a professional translator, and this translated version was then back-translated for consistency by two researchers, at a public research institute, familiar with the principles of questionnaire design and both languages in question. Although all the respondents are English language teachers, they are arguably more at ease understanding and responding to items such as these in their L1. In the final questionnaire, the English item was listed together with its Korean translation immediately below it (see Figure 5) in order to further increase the response rate. The questionnaire was administered using the QuestionPro online survey engine, and all quantitative survey data were collected in the summer and fall of 2014.



Figure 5. Screenshot of the online questionnaire format

5.5.5 Data analysis

Data analysis was conducted using SPSS 22. To begin with I assessed the specific assumptions of the TwoStep clustering algorithm (Everitt, Landau, Leese, & Stahl, 2011). The level of multicollinearity was examined through correlation coefficients for the clustering variables. These scores were found to be within an acceptable range, with all correlation coefficients between .20 and .70, indicating low collinearity among variables. Each continuous variable used in the cluster analysis was also screened for normality of distribution (i.e., both skewness and kurtosis were tested). None of the calculated z-values exceeded the critical values of +2 or -2, indicating the normality of the distribution at $p < 0.05$. Following this pre-processing, the data were analyzed using the two-step clustering procedure. In the analysis, all the categorical variables (e.g., age; years of experience; workplace) were discovered to be swamping variables and, therefore, only continuous variables were used. The variables selected for computing the clusters were teaching efficacy, resilience, attitudes toward teaching, openness, and classroom affectivity. The remaining variables of coping and burnout were not used in determining cluster membership, but merely served as evaluation fields in the cluster model.

The proximity measure used in the two-step clustering algorithm was the log-likelihood distance measure as it assumes that continuous variables are normally distributed and are independent, as was the case in this dataset (King, 2015). It also provided a better result than the default Euclidean distance measure for continuous variables. After a comparison, the clustering criterion chosen to determine the final cluster solution was Schwarz's Bayesian information criterion (BIC) because, with its conservative estimate of optimal cluster numbers (Kaufman & Rousseeuw, 2005), it resulted in a better model fit than the alternative Akaike's information criterion (AIC). Automatically determining the optimal number of clusters resulted in the algorithm settling on just 2 separate clusters of equal size. Thus, to determine a more meaningful cluster solution, a fixed number was specified starting with 3 clusters and the two-step algorithm was run repeatedly increasing the fixed number each time until it reached a ten-cluster solution. Each of these cluster solutions (i.e., 3 – 10 clusters) were compared by examining the overall cluster-solution quality, the predictor importance of the clustering variables used, and the cluster means in the SPSS Modeler. These solutions were also triangulated with the focus group data collected earlier to inform the final seven-cluster solution.

The validity of the final seven-cluster solution was established by first submitting it to a one-way multivariate analysis of variance (MANOVA). This was followed by examining the univariate main effects and conducting pairwise comparisons using Tukey's HSD post-hoc test for external criteria, namely the two variables of coping and burnout not used to determine cluster membership. Next a multinomial logistic regression was performed with the two continuous variables that were not used to determine cluster membership. Finally, classification accuracy,

which compares predicted group membership based on the logistic model to actual group membership, was used to assess the model's predictive utility (Tabachnick & Fidell, 2007). The results of these multivariate analyses were concluded as having satisfactorily validated the seven-cluster solution obtained from the two-step clustering technique.

5.6 Validation Study Phase III: In-depth Interviews

This final phase of validation, designed to shed light on underlying dynamic patterns in the observed system outcomes, was focused on exploring the following research questions:

RQ1: What are the signature dynamics that produce the various archetypes (i.e., those corroborated from validation study phase II) of language teacher immunity?

RQ 2: How do the various outcomes of language teacher immunity impact L2 teachers' sense of professional identity and their motivated behavior?

5.6.1 Design

The aim of this final validation phase was to investigate individual trajectories or pathways of development for particular teacher immunity outcomes. The final stage of RQM is driven by the need to understand the robust causal mechanisms for system development and offer a parsimonious account of the processes that led a system to produce a particular outcome. Along with identifying how teachers ended up in one particular state and not another, in this phase I was also interested in the

manner in which respective outcomes are displayed in teachers' emotions and beliefs, instructional effectiveness, and commitment and persistence within challenging instructional settings. The serial in-depth interviews used in this final phase of validation were purposely chosen to tap into particular stories of the participant teachers in order to uncover uniquely nuanced descriptions and explanations that were absent of any preconceived standpoint. This type of qualitative interviewing provides a more holistic, multidimensional representation of participants' multiple constructed realities which in turn leads to sensitive and transferable interpretations rather than verification of universal truths. Seidman (2013) proposes that rather than simply to get answers to questions, test hypotheses, or evaluate the genuine purpose of in-depth interviewing is to have the participant reconstruct his or her authentic experience within the topic under study. This design allowed me to explore the multi-layered and dynamic aspects of language teachers' experiences while acting not only as an outsider but also as a co-creator of meaning through my empathetic reactions to the participants' stories and my engagement with the data through interpretation.

5.6.2 Participants

Participants for the in-depth interviews (see Table 4) were sampled directly from the pool of respondents from the questionnaire stage of this study. Each of those 293 respondents had provided their contact information (in the form of an email address) while completing the survey and indicated whether or not they would be willing to participate in follow-up stages involving a series of in-depth interviews. The majority of respondents indicated that they would be interested, which made sampling for this stage of the study relatively straightforward. Once respondents'

cluster membership from the questionnaire stage of the study was determined, three representative respondents closest to the clustering centroids (i.e., the cluster mean) of each corresponding cluster (i.e., the 6 clusters validated from the original 9 focus group prototypes) were recruited for inclusion in the pool of follow-up interview participants ($N = 18$). Thirteen of these participants were female (72%). These interview participants, sampled directly from respondents in the questionnaire phase, were not given any information regarding the teacher immunity archetype to which they belonged. They each gave informed consent and were told only that they were good representatives from the earlier quantitative data set and that the researcher was interested in exploring the factors that have contributed to their current state as teachers (see Appendix F).

Table 4. Interview Participants Recruited from Cluster Centers

Cluster Archetype	Participants (<i>N</i> = 18)	Interview Length (Number)
<i>Cluster 1: Visionary</i>	Carrie	4:02:11 (3)
	Sam	3:28:04 (3)
	Susanna	3:19:16 (3)
<i>Cluster 2: Spark Plug</i>	Hyo	2:54:28 (3)
	Vivian	3:29:31 (3)
	Yong	3:17:51 (3)
<i>Cluster 3: Fossilized</i>	Alex	2:44:26 (3)
	Grace	3:23:08 (3)
	Sooyun	2:49:10 (3)
<i>Cluster 5: Defeated</i>	Allie	3:21:41 (3)
	Bella	3:08:54 (3)
	Hongjin	2:39:22 (3)
<i>Cluster 6: Sell-out</i>	Karen	2:47:05 (3)
	Min	3:09:12 (3)
	Simon	3:53:02 (3)
<i>Cluster 7: Overcompensator</i>	Jihoon	3:21:34 (3)
	Mike	3:45:09 (3)
	Subin	3:38:15 (3)
Total		62:12:19 (54)

5.6.3 Instruments

An interview schedule was drawn up with an objective for each interview (see Appendix G). The aim of interview 1 was to identify factors that have contributed to respondents' current teacher immunity archetypes. The purpose of interview 2 was to determine how respective archetypes influence teacher identity and self-concept. Finally, interview 3 was intended to identify how archetypes manifest themselves in motivated behavior. The interview guide included six broad questions for exploration

in each session scripted in a “Can you tell me about...?” style (e.g., Can you tell me about a time when you did something that helped define you as a teacher?).

5.6.4 Procedure

In order to produce a robust and comprehensive representation of the signature dynamics of each teacher immunity archetype, each of the 18 teachers—three of each archetype—participated in 3 in-depth, semi-structured interviews (Seidman, 2013) (see Table 4). All interviews took place during the fall and winter of 2014 and were conducted either in English or Korean in line with individual participants’ preferences. The in-depth interviews were conducted primarily in the institutions where participants worked in order to decrease the perceived power distance between the interviewer and the interviewees. The interviews were conducted following an interview guide, and were audio recorded and then transcribed with the signed consent of participants. All interviews were recorded using Audacity© on a laptop computer with an attached external microphone placed inconspicuously to the side of the interview area. I indicated that at any time if they became uncomfortable they were entitled to switch the recording device off. None of the participants chose to pause or stop the recording device, but this option was introduced to further minimize any perceived power gap between myself and the participants, none of whom had met me prior to their first interview.

5.6.5 Data analysis

Annotations were made in journal form to accompany the recorded data immediately following the interviews in order to draw on additional nonverbal aspects

of the interviews. The objective of these annotations was to overcome the inherent limitations of relying exclusively on self-reports of teachers' experiences and to further inform the data with converging and varied evidence. Data analysis of the serial in-depth interviews involved a search for patterns in this dataset and for ideas to help explain why those patterns were there. Preliminary process coding, breaking down data into gerunds in particular sequences, was used for all 18 participant nodes using NVivo 10 (Bazeley & Jackson, 2013). This was followed by focused coding into more conceptual and abstract codes combined with an integration of analytical memos (Richards, 2015). I then combined participants into their respective archetype nodes and used an a posteriori cross-case comparative analysis (Miles, Huberman, & Saldaña, 2014; Saldaña, 2015). All data analysis possesses an element of comparison, albeit to differing levels of explicitness and intentionality. Qualitative comparison strategies in particular treat each individual case as a configuration of characteristics, and thus they involve comparing configurations for singularities and commonalities (Flick, 2014). The present technique involved working through a cross-case comparison in a series of four comparative dimensions for the individuals in each archetype node (Rihoux & Ragin, 2009):

1. identify the absence or presence of particular phenomena in the coded accounts of different individuals.
2. explore similarities and differences between individuals in the manifestations of phenomena.
3. explore how the explanations of, and reasons for these phenomena are similar or different between individuals.

4. explore how the various impacts and consequences of these phenomena converge or diverge across individuals.

Finally, data were drawn up into a schematic representation of the unique signature dynamics of each archetype.

5.7 Conclusion

In this chapter I have summarized the research methods used in a series of four studies. I began with an overview of the research site, and the characteristics of L2 practitioners in this setting. I then described the participants, instruments, procedures, and analysis for (a) the exploratory case-study, (b) the focus group validation study (phase I), (c) the cluster analysis validation study (phase II), and (d) the in-depth interview study (phase III). The individual validation studies were informed by those preceding it, and were designed to build on findings sequentially.

6. Results & Discussion

In this chapter I report on research that was conducted as a sequence of studies to investigate the concept of language teacher immunity—what it is, how it develops, its different forms, and the implications it might have on L2 practitioners and their work. These studies are reported sequentially and were designed to build up an initial understanding of this novel construct language teacher immunity. The convention chosen to report qualitative data throughout the following studies is using *I* to indicate the interview number, and *P* to indicate the page of transcription.

6.1 Exploratory Study

Drawing on a series of 12 in-depth interviews with teachers in a range of language teaching sectors, this exploratory study was designed to investigate the question of what it is that, if indeed anything, sets apart teachers who thrive from those who struggle to survive, and whether examining teachers who are engaged and motivated, well-adjusted and productive might provide insight into the secrets to surviving as a teacher. Because I had an extensive corpus of interview data, the grounded theory analysis produced many angles to look at it from. What was missing was some form of organizing principle until it became clear that one reading of my data points to an interesting four-phase sequence, outlined earlier, which captures the emerging pattern of these teachers' individual experiences and the paths they have followed.

6.1.1 The emergence of L2 teacher immunity

Taking the teacher as the complex system in which self-organized change occurs, with the individual as the agent as well, an emergent process leading towards a self-organized outcome is apparent in these systems. Here I structure the reporting of the data using this developmental blueprint.

6.1.1.1 Triggering stage

In the triggering stage, an initial stimulus which acts as a disturbance dislodges the teacher from his or her motivational comfort zone. This trigger causes a disturbance similar to the ripples caused by a pebble being thrown into still water and it results in a major upheaval or interference in the system. This is in accordance with Kubanyiova's (2012) idea of the need to create dissonance in order for conceptual change to take place in teachers, an important idea which I return to later. The actual disturbance can involve a range of things, for example disruptive behavior by a student, a performance review, critical comments by a colleague during an observed class, or even the sudden introduction of new assessment targets. Disturbances that trigger change in a system all originate from events, concerns or realities that teachers deal with in their daily practice. The following comment by Hanna illustrates the kind of disturbances that were an overwhelming part of the experience of all the teachers in this study.

Sometimes I get evaluations with terrible remarks. (...) There are some people who say things that are very, very harmful and those evaluations influence me, definitely, and disturb me, and make me very unhappy. Sometimes a student

says “I didn't learn anything in class this semester”. That is very, very discouraging. (*Hanna*, I1, P3)

This feeling of vulnerability and instability that Hanna describes is essential in order for the teachers to register a need to act on the disturbances. It would simply be pointless and the teachers would become unable to function if the systems were merely dislodged and disturbed. Thus, in order to have any developmental effect on the system's modus operandi, the disturbance must trigger a heightened awareness so that the teacher becomes conscious of the need to do something about it.

The power that these disturbances have to both destabilize the system and get the system moving is apparent throughout the data, as in the excerpt below from one participant:

I wasn't just being cynical when I said that teaching only takes up 30% of my job. We English teachers often joke that we come to work to deal with paperwork and students' life, and then when we have time we go and teach.(...) However hard I try there are many things I can't change, so sometimes I feel betrayed and angry. (*Yumi*, I3, P6)

The goal-oriented endeavor of language teaching provides frequent performance feedback (Dörnyei & Ushioda, 2011), not all of which is guaranteed to be positive. Factors which shake teachers up and destabilize them have been central to most research findings in the L2 teacher motivation literature as far back as the 1990s (Pennington, 1991; Pennington & Riley, 1991). Framing these factors in a developmental sequence from a dynamic systems perspective illustrates that when

they are amplified, destabilizing factors may allow the teachers to adapt and reconfigure in response to upheavals.

While it may be commonsense to think that all disturbances will end up dislodging the teacher from stability in their practice, automatically assuming that a disturbance will result in a consequence of equal magnitude is a risky proposition. Many times teachers ignore or brave hardships, while at others they suffer through them in silence. At other times they take small slights to heart that then shake them up to the core of their teacher being (Bullough, 2005). For example, the feeling that his creative initiative is rejected registers strongly with Wilbur, and as a result he feels an incredible need to act on being rebuked by his superiors to avoid ever experiencing this again.

I could always just phone it in, you know, come in with the book and say “open to page 13; today we’re going to cover the present participle”. But when I (...) do something that represents hours of thought and planning, and then I’m punished for it and my job is in jeopardy, that is strong, strong discouragement from trying it again. Once burned, twice shy. Right? (*Wilbur*, I2, P8)

In cases when teachers experience disturbances which shake the system up in a way that is considerably larger than the initial stimulus, this is evidence that cause and effect are not simple and linear. Like the echo of a shout in a cave that expands and travels outward, it is apparent that the disturbance has been amplified.

6.1.1.2 *Linking stage*

Following the triggering stage, the linking stage involves the generating of a specific response or coping mechanism that matches these disturbances through an adaptive within-system behavior known as coupling. The linking stage introduces coping behaviors, such as in the example given by Soojin below, that the teachers use to try to make sense of the disturbances they experience.

Give up and go home. (laughs) No, but it's true. I mean I don't know if someone's going to tell you I go home and punch pillows or I go into a room alone and scream, or something. (...) I think sometimes I do dramatic stuff. But, sometimes it's better to just let out my feelings when I'm having a bad day. (*Soojin, I2, P5*)

The components that are strategically coupled together here are the disturbances and the strategic reactions to the disturbances which the teachers begin using to try to move back in a safe direction and resettle the system. These making-sense-of-disturbances behaviors interact in cycles with the disturbances themselves and the success of these cooperative interactions allows the teachers to absorb difficulties and challenges, and thus enables the system to cope with the initial shake up and loss of equilibrium. Previous research has examined how teachers can channel their responses in order to counter stressors (Griffin, Steptoe, & Cropley). However, when viewed from this developmental sequence, the data from this case study suggest that strategic responses to disturbances are channeled by the coupling of an adaptive coping response that matches these disturbances.

Along with adapting to their environment, humans also have a profound desire to control it so they can re-align towards internal stability (van Geert & Steenbeek,

2005). Teachers generally desire to maximize their functionality and instructional performance in the classroom; they want to perform the best that they know how (Day, Sammons, Stobart, Kington, & Gu, 2007). These teachers' ways of trying to control the disturbing circumstances with which they come into contact begin with a response that is reactive in nature, as in the case of Yumi:

How did I deal with it? In my previous job I just gritted my teeth and did it. I kept trying new things and tried to be explicit about why I was doing them.
(*Yumi*, I2, P9)

Because coupling involves recursive feedback loops, as the participants continue to experience disturbances over time, like Hanna below, they begin responding to them adaptively:

Another thing is always try to look on the bright side. For example if a bad thing happens I try not to choose the negative way of looking at things, and that mindset gives me a kind of peace and probably helps me survive hectic situations sometimes. (*Hanna*, I2, P4)

And, because memory is a form of feedback, when these teachers adapt their responses to the disturbances based on previous intelligence or experience they progress to responding pre-emptively to disturbances like Soojin.

Even though you may fail, there's no reason to get frustrated and disappointed. Of course I don't ignore my problem students, but I ignore my insecurities. Sometimes I feel if I can do that I can get over a lot of issues. (*Soojin*, I3, P7)

The participants continuously modify their reactions in response to the ongoing disturbances they experience and, just like with mutualism between biological species, when these dynamic interactions take place during linking, the exchange results in an overall benefit for the system (Banzhaf, 2009).

6.1.1.3 Realignment stage

Eventually the teachers develop the ability to make sense of these disturbances, and come to grips with them and even control them. This is the realignment stage. When the teachers find a way of dealing with the disturbances they experience and regain their productivity it is because they have consciously applied strategies that seem to work to bring the system back under control of stability. The teachers were more or less conscious of the beginnings of this return to stability, and the following quote by one participant illustrates how she believes this is done.

Even though sometimes I felt that I was wasting some years teaching, now I feel it was worth it. It would have been better if I had minimized the problems. But at the same time things that are not experienced will never be learned, so in that sense it was a good experience (...) and almost all these experiences were worth going through. (*Hanna*, I3, P10)

While a layperson view of the natural or default state of a dynamic system is that it resides in a state of stability, this is in fact not the case because when equilibrium does occur in a dynamic system it is situational (Dooley, 1997). More importantly, however, as is the case with the process these teachers have gone through, stability always emerges through self-organization (Thelen & Bates, 2003).

It is also important to remember that stability is dynamic. In complexity terms this means that it results from opposing forces of growth and decay that exert an equal strength on the system (Haken, 2009). Here, in the realignment stage, the opposing forces which have resulted in this novel outcome of stability are the coupled disturbances and the teachers' strategic responses to them. Wilbur's thoughts about how this new stability emerges show that these teachers were well aware that this is not an accidental stability.

I think [challenges] makes you a stronger teacher. I recommend that teachers in general experience these challenges, and I know this sounds a bit unfortunate for new teachers, but it's almost something you should go through to become a teacher at a different level. (*Wilbur*, I3, P5)

This emergent stability is developed, not from a single interaction, but from the accumulated adaptation of the system to the disturbances it has encountered. Because of its dynamic origin, it is not fixed or permanent, but is in fact prone to constant tweaking in response to contextual interests and demands (Thelen, 2005).

Almost every participant explained at length in their interviews how facing adversity in their teaching career has led them to gain greater stability, and this illustrates something that can be traced through all the participant-cases: settled teachers are made, not born.

It may sound strange, but as a teacher having only good students would make my life that much easier, but (...) even those disruptive students, thanks to them I experienced a lot and learned a lot so that I can get richer as a teacher. If I hadn't experienced dealing with those students I wouldn't have been pushed to find solutions. (*Soojin*, I3, P1)

The data suggests that working through difficulties and hardships by using the kinds of strategic behaviors noted earlier leads these language teachers to a stability that does not come built-in, but is emergent.

6.1.1.4 Stabilization stage

In the final stage of stabilization the teachers accept and solidify this residue of experience as a new aspect of their identity. The teachers have now added a layer of residual experience to themselves that will go on to affect the way they react to future disturbances, almost as if a layer of wisdom was added to their repertoire of dealing with disturbances. This kind of implicit experiential knowledge is largely an inevitable consequence rather than the product of conscious self-reflection, but it is also what makes good practitioners so precious: given their experience of living through the good and tough times in their practice, they have seen it all and done it all.

Whenever I'm in the classroom my worries disappear and I just concentrate on the things that happen in that moment in the classroom. I guess that's one thing I've developed as a teacher over time. When I'm in the classroom I easily forget things that are happening all around me and I just concentrate on the classroom setting. (*Hanna, I1, P4*)

It is this new outcome that has emerged which can be regarded as *teacher immunity*. This teaching immunity develops much like human biological immunity whose primary purpose is to protect the system in which it resides. Most practitioners or professionals working in teacher education will likely be familiar with teachers

described colloquially as being “thick-skinned” due to their decades of experience and accumulated expertise. Teacher immunity is a more precise word which specifies that this outcome always developed out of an initial defensive reaction to disturbances and upheavals.

Just as humans are rarely ever born innately immune to viruses, no single participant entered the teaching profession with this immunity. As Yumi reflects below, all the participants in this case study recounted having gone through periods when they became “infected” so to speak and lost systemic integrity and coherence before gradually developing this immunity through the sequence of self-organized stages.

When I was younger I was less stable. But now I’m more formed and optimistic so that’s why I can reflect on my lessons or stories to other people I come in contact with. I feel now that I’m more settled and optimistic and all those things I’ve been through have helped me to be more solid. (*Yumi*, I3, P8)

Even though these teachers now continue to experience disturbances that may cause minor fluctuations in their immediate day-to-day stability, this immunity acts as a buffer. This buffer overrides the effect of continuing disturbances on the entire system and allows the teachers to continue to function instructionally in the classroom, and emotionally and psychologically over the course of their careers (Thelen, 2005).

Nowadays I still have frustrations, yes. Of course at the beginning, it was much worse. But nowadays I feel less nervous (...) and less insecure. (*Hanna*, I2, P5)

Teaching is one of the most stressful professions that exist (Kyriacou, 2001), and when teachers are in a classroom with 30 or 40 adolescents they must remain constantly on red-alert. Making even one silly mistake means the teacher is apt to be caught out. But, just as in the example given by Hanna above, the teaching immunity that each participant develops allows them to avoid vulnerability to the high-stress levels and the emotional strain inherent to the profession, and thus control and respond to shifts that threaten their equilibrium.

6.1.2 What does language teacher immunity do?

Having drawn attention to the way in which this emergent outcome develops, I turn now to addressing the question of what the function of this teacher immunity might be. Teacher immunity, the data indicate, must always be defined as a resistance to something because, like its biological counterpart the human immune system, it develops as a reaction to disturbances. Just like the body's immune system is an effective barrier that prevents against certain infections and pathogens, the experiences of these teachers suggest that teacher immunity acts as a line of defense to the demands placed on teachers, and the often traumatic experiences they encounter which result in emotional exhaustion and burnout. This immunity materializes in different guises—with the potential to be either positive or negative—and has the potential to affect almost everything that teachers do in their careers.

Regardless of how it manifests itself in their persona, the first thing it may allow all language teachers to do is to survive and remain within the profession in the long run: to safeguard against emotional upheavals, motivational setbacks, and threats to the self. Teachers who do not develop this immunity are likely to remain vulnerable

to commonplace working circumstances such as a lack of preparation time for classes, requirements for excessive amounts of paperwork, routinely teaching oversized classes with inadequate assistance, and being excluded from decision making (Greenglass, 2000). Because of this primary function of ensuring the system's survival, developing a productive and robust resistance to hardship appears to be a prerequisite to becoming a competent teacher, a notion explored separately by others in mainstream teacher psychology (Bullough, 2005; Kelchtermans, 2011). A productive immune system may enable teachers not to be susceptible to stress, failure, or burnout. Soojin explains some of the benefits she feels now that she has developed this productive self-defense mechanism.

It's been only 8 years since I started teaching, and I came to this field a little later than others. There are some really senior teachers who in a playful way call me a senior teacher already. So in terms of teacher wealth I hope I'm in the middle class now and I'm trying to get richer. But I think I've finally found my niche. (*Soojin*, I3, P1)

Due to the protective armor of this immunity, teachers like Soojin are able to ignore disturbances and deal with stress productively, and in turn to experience higher levels of commitment, engagement, and career satisfaction.

In order to be maximally effective this immunity must also be robust. In complexity terms, this measure of strength is called *resilience* (Newman, 2009). From this perspective, an immune system can be termed resilient (a) when virtually no amount of upheaval can unsettle the system, and (b) when this stabilizing effect lasts over an extended period of time (Strogatz, 1994). Yumi's anecdote below illustrates

how a robust immunity functions to support teachers when they deal with disturbances.

I helped this troublemaker graduate from middle school, but there were many other kids who were influenced by him, so he was like a school scoundrel. Actually my colleagues at school thanked me for that because if he had to come back next year it would've been big trouble for them, but because he graduated I got a reputation for solving tough problems. (*Yumi*, I1, P6)

Not having this productive and robust teaching immunity is likely to result in low teacher morale, motivation, and self-efficacy. Teachers mired in these circumstances will eventually burnout and leave the profession. However, as the data in this case study illustrates, teachers who have developed a productive and robust resistance will be able to function and even thrive in the profession despite these adverse conditions (Klusman, Kunter, Trautwein, Lüdtke, & Jürgen, 2008).

6.1.3 Counterproductive immunity

Just as, nutritionally, there is good cholesterol and bad cholesterol, the language teacher immunity identified here can manifest itself as a positive resistance, or as a counterproductive teacher autoimmunity. Teacher autoimmune disorder might be said to occur when the residue of experience solidifies into a permanent, maladapted and fossilized resistance that can be expressed, as Wilbur does below, in the more common-place terms used to describe teachers such as thick-skinned, resigned, cynical, uncaring, or the well-known I'm-just-doing-it-to-pay-the-bills attitude.

I have met people who sort of just go through the motions and teach the kids that are shoveled at them. To me they're teaching but they're not teachers. (...) They're teaching just to kill time or just for a paycheck. (*Wilbur*, I3, P5)

Because teacher immunity develops in reaction to disturbances, examining the biological immune system will highlight a further parallel that justifies the use of this metaphor. While the body's immune system is an efficient self-defense mechanism against certain pathogens and infections, aberrant and harmful immune system responses can and do occur (Maier, Watkins, & Fleshner, 1994). This counterproductive immunity, such as when the immune system attacks healthy cells or the host body itself, or when it responds with an excessively aggressive resistance to innocuous stimuli, can have an unintended and debilitating impact. In teaching terms, this maladaptive immunity can manifest itself through undesirable consequences such as excessive rigorousness and settledness, conservatism in pedagogy, and reluctance to change or show any openness to new ideas (Bullough & Hall-Kenyon, 2011), resulting in those clever dinosaurs not uncommonly found in many sectors of the teaching profession.

In addition to this, from a complexity perspective, the excessive stability that accompanies teachers' maladaptive immunity will work against further self-organization in the system because it suppresses its internal dynamics. This highlights a complexity principle that is often overlooked. It is a fallacy to assume that a dynamic system's degree of settledness is in a direct linear relationship with its degree of effectiveness (Thelen & Bates, 2003). From the system's perspective, immunity is convenient as it allows the system to survive (Holland, 1992). However, excessive stability over time may lead to the maladapted outcome of counterproductive

autoimmunity. From the students' point of view this teacher autoimmune disorder can be disastrous if they have a teacher who resists all innovation and has done the exact same thing for 30 years. Hanna's insightful comment reflects this.

In many ways experience does not equal a better teacher. (...) Think about people working in other sectors. There is no other industry that allows you not to progress and still survive or keep your job. Why do teachers believe they can stagnate and not improve like everyone else is required to in any other field? (*Hanna*, I3, P7)

Kelly offered the well-cited observation that, because of our tendency to analyze things and implicitly construct an understanding of the world, human beings are naive scientists (Friedman & Schustack, 2010). Thus, this naturally developing teacher immunity can lead to a maladapted and fossilized narrative which consciously prevents any response in the system (McAdams, 2006): it may result in teachers who not only fail to respond, but are proud of doing so. While the productive version of teacher immunity can lead to increased confidence and a stronger commitment and engagement (Bullough, 2005; Kelchtermans, 2011), its counterproductive doppelganger can be disastrous because it results in teachers who have stubbornly stuck to the same classroom methods for three decades despite the detriment to their students (Meister & Ahrens, 2011).

6.1.4 Influencing the development of immunity

As a construct, teacher immunity has substantial implications. With a clearer understanding of how its developmental process takes place, the immediate follow-up step will be to raise important questions about the more immediate consequences. Too

often it is apparent that the developmental process ends up in a negative outcome of counterproductive autoimmunity, which highlights the issue of how the self-organized outcome can be influenced or altered, and how elements that will move the system into the other direction can be introduced, and when they should be. Because a dynamic system cannot be shut down and self-organization cannot be paused (Johnson, 2009), the most effective interventions are likely to take place during the formation of counterproductive immunity. The secret to successful intervention, then, is tweaking the system during self-organization, and to do this additional understanding is necessary of precisely how teacher immunity becomes productive and resilient.

6.1.4.1 Narrative formation

One way that the outcome of language teacher immunity might become productive and resilient is through individuals building productive narratives to make sense of their life experiences (McAdams & Pals, 2006). This facet ties back to the prominent narrative nature of teacher identity. Scholars are in agreement that addressing problems head-on and working towards a positive resolution of the negative event leads to better understanding and increased well-being than repressing, denying or dissociating from those experiences does (Lundberg, 2000). Individuals may try to come to terms with negative life events by constructing general meaning to their existence based on particular episodic experiences—a phenomenon called *autobiographical reasoning* (McAdams, 2008). In general, negative experiences tend to produce more thought, causal reasoning and exploration of consequences through narrative construction than positive episodes do. Because of this, the negative

experiences that are a routine part of many teachers' lives demand an explanation if the teachers are to gain insight from them and move past them productively and maturely (Kyriacou, 2001). By providing supportive frameworks for teachers to think about how their negative experiences came about and what consequences they could have, it may be possible to influence the formation of narratives and help those teachers to commit to a positive resolution of that event (McAdams, 2006). This in turn will steer their teacher immunity in a productive and resilient direction while it is still in the developmental stages and allow only the productive and robust variation of immunity to become part of these teachers' transportable, core identities (Schultz & Ravitch, 2013).

6.1.4.2 Cognitive dissonance

Looking at the research into language teacher cognition, a literature which covers what teachers know, think and believe (Borg, 2015), may provide additional ideas for altering the formation of counterproductive immunity. Kubanyiova's (2012) theoretical model of Language Teacher Conceptual Change (LTCC) proposes that, among others, two primary reasons that teachers remain resistant to change are (a) because of the lack of dissonance between their actual and possible selves, and (b) because the threat to their sense of self is too great to reconcile. Research using the LTCC model has shown that conceptual change will not happen unless there is a major disturbance—termed dissonance—to trigger it (Kubanyiova, 2009, 2012). These past findings suggest that teachers who have developed the solid shell of counterproductive immunity may in fact need to have things significantly shaken up in order to dislodge them from the rut they are entrenched in (see also Dörnyei &

Kubanyiova, 2014). In order to break through the detrimental effects of maladaptive immunity so that the teacher can develop productively as a professional, dissonance must be introduced that will suppress the hard shell of this counterproductive autoimmunity.

While the purpose of Kubanyiova's (2012) LTCC model is not to provide extended reasons why dissonance is needed, the concept of teacher immunity emerging from the case study data here might offer one explanation of why there is a need for disturbance. Take for instance the analogous process of immunosuppression in the human body. In immunosuppression, the protective function of the physical immune system is purposely diminished in order to bypass potentially unwanted effects (e.g., when someone has received an organ transplant and the doctors administer immunosuppressant drugs to prevent the body from rejecting the new organ). In order to redirect the developmental path of this counterproductive teacher autoimmunity, it is essential to first find the equivalent switch in the mechanism that allows this suppression effect (Folds, 2008). Ultimately, the emergence of teacher immunity is concerned with what transpires inside the mind of language teachers and may be one key condition which permits them to thrive in the profession. With respect to second language teacher education, it is unlikely that anyone could simply come in from the cold and do certain magical things to teachers that will inspire and energize them. Rather, in a profession as challenging as language teaching, it must be acknowledged that teachers are engaged in an ongoing psychological immunization process. Simply approaching teachers out of the blue, and saying some intelligent things will have little impact unless they are ultimately able to connect it to the developmental process of teacher immunity they are currently involved in. Instead,

good motivational practice will involve understanding this developmental process and working within it by targeting its elements in order to steer it to a desirable and positive outcome—an outcome that this initial study suggests teachers' very survival in the profession depends on. Thus, there is clearly more to discover about the teacher immunity process and how to influence it.

6.1.5 Interim summary

This exploratory case study was designed to investigate the question of what it is that sets apart teachers who thrive from those who barely even survive. In response to this question of what the secret to surviving as a teacher is, the data analysis highlighted a process that these four language teachers from different sectors followed in developing what I have argued can be regarded as a unique teacher immunity emerging as a result of disturbances. It became clear that what set apart these four teachers was that they had all developed an outcome, teacher immunity, which other teachers may not have developed. Thus, my findings suggest that the primary function of this teacher immunity is to allow teachers to survive and function within the profession. Furthermore, if this immunity develops as a productive and robust outcome it may enable teachers to thrive in the profession. Perhaps not surprisingly, however, there are few guarantees that teacher immunity will develop into the productive and robust variety, and teacher immunity can manifest itself equally in a counterproductive form. Although none of the participants were cases of this emergent outcome, several of them alluded to it and reported having witnessed or worked with colleagues who manifested it in some form or another. The thick callous of this counterproductive autoimmunity could be argued as causing teachers to

plateau and fossilize, avoid responding even when it is necessary, and resist positive change throughout their careers. I examined potential ways in which the outcome could be guided along its developmental path into a positive outcome. These included influencing the formation of a narrative—an idea which links not only to notions from identity formation, but is also fairly robust within the coping literature—and a concept taken from the theoretical model of LTCC, introducing dissonance to suppress the resistance effect of the fledgling counterproductive autoimmunity.

In dealing with complex dynamic systems that are human beings, there may be a temptation to describe the immunity that emerged as a personality trait or some other individual property (Boschetti, Hardy, Grigg, & Horowitz, 2011). It may be convenient to attribute the professional immunity of these teachers to their personalities or the unique set of experiences they have each come through in their careers (Malmberg, 2006). However, as with similar emergent properties, it seems not only more compelling but also more accurate to see it as resulting from the self-organization of the system (van Geert, 1998, 2009). The fact that these four teachers all have varied backgrounds and distinct personalities, followed multiple paths to the profession, and teach in different instructional contexts, is evidence that the shared structure and function of their teacher immunity, and the motivational synchrony they exhibit, are a result of patterns developing qualitatively through self-organization (Haken, 1985). This case study was an informative starting point in examining what it is that sets thriving teachers apart from their less fortunate counterparts. However, given the modest dataset, and the exploratory nature of the study itself, many questions were left unexamined.

A validation study, designed as a series of complementary research phases, was intended to explore these questions. First, while the data from the exploratory study indicated the existence of both a productive and maladaptive global teacher immunity outcome, a legitimate conclusion would be that there must also exist a non-immune outcome, as well as partial immunity outcomes—particularly given the dynamic developmental perspective from which the productive and maladaptive outcome emerged. Equally plausibly, there is likely to be more than one specific kind of productively immunized teacher, with the same logic applying to the other global outcomes. In other words, each of these global teacher immunity outcomes must also manifest themselves through a range of phenomenological teacher archetypes with a distinct profile of characteristics. Furthermore, with regards to the developmental pattern for teacher immunity highlighted in this exploratory study, each of these distinct archetypes of teacher immunity must also emerge through somewhat unique trajectories that are nevertheless consistent with the larger self-organized sequence. Tracing the unique developmental dynamics of each outcome is important precisely because it will offer insight into ways in which to influence and redirect trajectories of system development that are moving toward a non-productive outcome. Finally, a compelling inference about the implications of language teacher immunity are that it has a profound influence on teachers' psychological well-being and resistance to the structural challenges of teaching, their motivation and engagement as practitioners, their persistence in the profession and even their instructional effectiveness. However, in order to understand more about these issues related to teacher immunity, it is imperative to further scrutinize its make up, its manifestations, and its impact on the

definitional tasks of language teachers. It is with this aim in mind that I now turn to reporting the follow-up validation studies.

6.2 Validation Study I: Establishing Preliminary Teacher Immunity

Prototypes

Drawing on focus group interviews with language teachers, teacher educators, and administrators, the first phase of the RQM validation study (which I refer to here as study 1) was designed to identify the most salient types of language teacher immunity within each of the global types (see below), and to investigate the componential makeup of these specific teacher prototypes that would allow me to build theoretically and phenomenologically robust cases of these for validation in the second phase. Throughout this and the following sections of the results and discussion, I refer to the preliminary teacher types encountered here in the first stage of the validation studies (i.e., study 1) as *prototypes* to imply that they are the original exemplar of teacher immunity outcomes on which collection of subsequent validation data is based. The prototypes which emerged from these four focus groups are reported below. All data excerpts included in this section have been reported verbatim from the focus groups.

The three main global types and two halfway types chosen as superordinates of actual teacher immunity outcomes included:

- a) *productively immunized teachers* (i.e., those with a robust yet healthy form of teacher immunity);
 - a1) *partially immunized teachers* (i.e., those who had developed particular elements of the flexible and beneficial form of teacher immunity);
- b) *maladaptively immunized teachers* (i.e., those with a rigid and counterproductive form of teacher immunity);

- b1) *partially maldaptively immunized teachers* (i.e., those who had developed partial aspects of the detrimental maladaptive form of teacher immunity);
- c) *immunocompromised teachers* (i.e., those who have not developed a teacher immunity).

By cross checking for overlaps and redundancies in the illustrative descriptors of the original pool of nearly 30 teacher types elicited, a narrower list of 9 teacher prototypes was synthesized (see Table 5 for a summary of these). The names chosen below for these all teacher immunity prototypes emerged during the focus group sessions.

Seven components were found to be essential to the make-up of all these outcomes: *teaching self-efficacy* (i.e., teachers' personal beliefs about their effectiveness to competently perform their jobs); *attitudes to teaching* (i.e., teachers' sense of purpose, and commitment to the profession); *coping* (i.e., teachers' strategic action to remedy a situation or eliminate stress); *classroom affectivity* (i.e., teachers' positive emotional energy in the classroom); *burnout* (i.e., the psychological erosion that results from cumulative chronic stress); *resilience* (i.e., teachers' capacity to bounce back from trauma and maintain productive functioning despite risks and threats); and, *openness to change* (i.e., teachers' receptivity towards change and novelty in their practice). Particular combinations of these at varying levels were exhibited as specific profiles of language teacher immunity. I report on these in detail below.

Table 5. Summary of Superordinate Teacher Immunity Types and Prototypes

Teacher Immunity Global Type	Initial Prototype
Productively Immunized Outcome	The Spark Plug
	The Visionary
Maladaptively Immunized Outcome	The Sell-out
	The Fossilized Teacher
Immunocompromised Outcome	The Overcompensator
	The Bleeding Heart
Halfway Immunized Outcome	The Defeated Teacher
	The Poseur
	The Striver

6.2.1 Productively immunized teacher types

The Spark Plug.

Teachers in this prototype were described as dynamos—irrepressible individuals who also exhibit an appropriate level of maturity, composure, and flexibility. They are mentally and emotionally healthy, and possess the necessary resilience to not let work-related problems spill over into other aspects of their lives. As professionals they appear to take immense personal pride in master craftsmanship and are devoted and passionate about doing their best and constantly honing their professional practice. One focus group participant summed up these qualities when she said that

We have all worked with totally devoted teachers who think of themselves as being ‘called’ to the profession. (...) They are there for their students when it matters, and they just live and breathe like they were born to be a teacher.

(focus group 2, P5)

This unmatched zeal for teaching comes as a surprise to their peers and colleagues, and led another individual to describe these teachers as being “keeners” (focus group 3, P3). These teachers are seen as attracted to taking risks, and as thrill-seekers willing to embrace difficulties and challenges. This is because they believe that actively confronting problems allows them to avoid plateauing or stagnating as practitioners. The following focus group excerpt illustrates this well.

Adventurous teachers like this, who have concrete ideas about why they got into the profession, find teaching to be far easier. They are open-minded, and don’t simply imitate others or stick to one preferred method. They see something new, and they take it and try it, and make it their own. (focus group 4, P3)

Even though they are actively questing for new ways to grow and improve, these teachers are far from being perfectionists. At their core, they are unpretentious and feel a sincere sense of downward responsibility to their students. They believe that students will reward their efforts with positive responses and successful learning outcomes. The contagious enthusiasm of these teachers often rubs off on their colleagues, and they are often looked up to as role models by peers who would like to emulate them. As one participant put it:

Because of their ability to spark magic in the classroom, I think they could be the future leaders if they're allowed to be. (focus group 1, P2)

The Visionary.

The focus group participants described this productively immunized teacher prototype as being a “dreamer” (focus group 2, P2) or big thinker who has a hopeful disposition but is also tenacious and possesses a sense of righteous anger with the perceived flaws of the system. These teachers are out to “make a difference” (focus group 4, P5), and are seen as hungry for big-picture solutions that will address the many problems they encounter in the language classroom. Discussing this issue, one focus group participant observed that:

It is useful to ask ‘what has angered them?’ because anger can spark passion. Their passion comes from anger towards the system and knowing that it’s not working to its full potential. This frustration drives their passion, and meeting more people who share their anger feeds it. (focus group 3, P7)

They are driven individuals who approach problem-solving intelligently and are aware that dilemmas with complex origins demand careful solutions. However, their anger with perceived deficiencies of the system they work in serves as a powerful drive to bring about change.

On the whole they are seen as well-adjusted and at peace with themselves; they know that they are imperfect and they are able to live with this knowledge. Because they are buoyant and spirited individuals, they are able to see the light through the despair and disillusionment of those around them. This view surfaced in the following focus group extract:

This ability they have to find new angles that will help them regain their faith or a different approach to boost confidence is not valued highly enough by others. There is always a thirst for new hope and new inspiration, and a conviction to right the wrongs they see. (focus group 1, P3)

Teaching was described as the choice of profession that is most congruent with their authentic selves. What drives them is not so much the gritty detail of what they do, but the grand narrative of what they believe in. By nature, they are activists, and will enlist support from others to build strong networks of like-minded colleagues who can collaborate to deal with the root causes of problems. The feeling that they are contributing something or making a difference keeps them in the profession because they are essentially humanist at heart and show a “deep care” (focus group 4, P5) for others.

6.2.2 Maladaptively immunized teacher types

The Sell-out.

Participants in the focus groups described this teacher prototype as someone who despite barely being able to hack it, has nevertheless hit “cruise control” (focus group 2, P3) and given up caring altogether. This type of teacher goes through the motions while doing the bare minimum to get by and not raise red flags. They are seen as apathetic and complacent in the workplace, attitudes that are often compounded by their indifference to students and their emotional unavailability. The following comment by one focus group participant underscores this.

I'm sure you've seen this kind of teacher and everyone around knows that she hates her job, hates her students, hates her life. (...) Sometimes, she can only see joy through the bottom of a bottle. (focus group 3, P2)

A recurrent theme that surfaced in the focus group interviews was how it seemed that this type of teacher has thrown in the towel professionally, without actually having left the profession. Additionally, as practitioners they appear to have no desire to be inconvenienced or break out of their comfort zone. Consequently they are prone to denying the existence of problems and tend to ignore those that they do encounter.

Asked about their reasons for entering the profession, they will seldom reference motives other than those regarding their own self-interest or what is in it for them (e.g., the promise of economic stability, individual social status, etc.).

Colleagues and peers of this type of teacher may remark that the financial compensation this teacher receives actually exceeds the amount of effort they put in. One focus group participant recounted meeting a teacher like this.

He told me 'the secret I've figured out in the classroom is to do just as much as I earn, and no more.' He was a jerk anyway, but I honestly believe that this kind of teacher contributes to ordinary people criticizing and insulting teachers as a whole group because they see us as lazy and indifferent. (focus group 1, P4)

This type of teacher was also described as being resentful of others who see them as a servant to society when they feel that teaching is just a means to a paycheck—a job that ultimately they would walk away from if they had the choice.

The Fossilized Teacher.

There was a sense of agreement among focus group participants that these teachers have difficulty with newness, and are comfortably set in their ways—underscoring their aversion to change. In the description given by the focus groups, this teacher prototype often believes that their years of experience translate into increased expertise, but in fact their practice is likely to have plateaued around a rudimentary repertoire of techniques or a teaching routine that, while minimally adequate, is stagnant.

Every teacher faces new situations that challenge their skills. But their main reason for being rigid is this fear of changing. Innovation demands experimentation, and a lot of failure along the way. But these teachers, even when they are struggling with very serious classroom problems, stick to their method because they don't want to endure the hardship from transforming.
(focus group 4, P6)

Once they have found a set of techniques that works for them or a teaching routine that is acceptable to them, they become indifferent and plateau: things around them may change but they will remain the same. Because they have acquired a minimally adequate effectiveness in their teaching they believe they are street savvy and thus become unwilling to upgrade—one focus group participant even went as far as to say that “you simply can't teach an old dog new tricks” (focus group 1, P7).

While teachers in this prototype often feel they are peerless and have nothing new to learn, they are perceived as exhibiting an open jealousy and hostility to other more confident teachers that has far reaching effects on those around them. As one participant put it:

If these teachers who don't care about growth or change are in positions of authority, then other teachers who are under them absolutely cannot try new things or implement change. If they do they will be ostracized and singled out for ridicule or punishment for their creativity and for being 'deviant'. (focus group 2, P4)

This type of teacher subscribes to the belief that learning is students' responsibility, so care very little whether students actually do learn from them or not. Their interactions towards students can be characterized as "frigid and unemotional" (focus group 3, P5). Teachers who belong to this category are seen as having very little affection for students to begin with, and they regularly complain about their professional responsibilities and students, yet will not try to improve their classes or increase their understanding of their students because as practitioners, they have no desire to be inconvenienced or break out of their current comfort zone.

6.2.3 Immunocompromised teacher types

The Overcompensator.

A common view among the focus group participants was that this teacher prototype suffers from the "imposter syndrome" (focus group 2, P1)—a phenomenon in which one's sense of professional self-worth is characterized by seemingly unwarranted feelings of abject inadequacy. These teachers have not developed a strong teacher persona yet and strive endlessly to overcome their fundamental sense of inferiority. Teachers like this are seen as being prone to second-guessing themselves, and constantly questioning whether their classroom practice is as it should be. The extract below which describes just such a teacher illustrates this well.

No matter how much she prepared, she couldn't succeed in the classroom. And, the more she experienced failure, the more nervous and insecure she became. Coworkers tried to help her in different ways but this only made matters worse, as she became more and more dependent on other teachers. (focus group 4, P2)

Linked to this is an excessive commitment to professionalism and an obsession with developing as practitioners. In their desire to compensate for their inadequacies as practitioners they tend to be pseudo-perfectionists at heart. These unfiltered efforts to improve their practice were described as random and erratic by focus group participants who perceived these teachers' behavior as prioritizing busy work and valuing quantity over quality. One individual expressed the view that:

The fact that they are still on shaky ground means that they are using this behavior to compensate. You can see it from a mile away, and they are trying to hide their lack of confidence by coming across as all eager. (focus group 1, P5)

Unfortunately for them, this high commitment does not seem to be rewarding nor does it have emotional benefits. Ultimately, their efforts are not gratifying as they are easily frustrated and often find themselves exhausted and burned out. Teachers in this prototype are often bewildered as to why they cannot achieve a sense of professional stability, and in the face of obvious failure will convince themselves that they must try even harder, leading one focus group participant to describe their behavior as "self-punishing" (focus group 3, P6) in nature. Because of their obsession with this pseudo-

perfection, they are unable to divide or balance their work and life, which can lead to a spillover that destroys personal health and relationships.

The Bleeding Heart.

Teachers in this prototype are characterized by emotional fragility. Generally, they are not optimistic about their place in the profession and expect more bad things to happen to them than good. These teachers believe that they do not have anything to offer as a teacher, are fundamentally insecure in their ability to help their students, and have a tendency to take failure personally. One participant's comment illustrates the emotional fragility of this prototype.

To me these teachers are emotionally handicapped. (...) They have no clue about how to cope with the harsh realities of school life and so they just stumble painfully through their days in the classroom. (focus group 2, P8)

Their response to this lack of confidence in their own teaching competence differs substantially from the *Overcompensator* prototype. The focus group participants suggested that it is a rare day on which teachers in this prototype do not think about leaving the profession, and if given the choice again, knowing what they now know, they would not become teachers in the first place. They further suggested that simply surviving each day is a small miracle for this type of teacher—something apparent in the following focus group extract.

Because they take every failure personally, they are easily wounded and can flip at any given moment. They will break down and cry at the drop of a hat. (focus group 4, P4)

They consistently engage in self-blame and alienate themselves from others, and many find themselves taken advantage of by others. Ultimately, many of them look for ways to “cut their losses and run” (focus group 3, P7). This idea is highlighted in the remarks of another focus group participant.

Every day she makes a mark on her calendar as proof of her survival. Now she is one day closer to the day when she can finally be free from all the pain and suffering and actually start living again. (focus group 1, P2)

In their attempt to deal with their insecurity and the mental and emotional fatigue they experience, they are seen as placing most of their attention on superficial cosmetic fixes and short-stop remedies rather than solving the root causes of problems. For example, because they feel that there is not much substance to their teaching, teachers in this prototype are often uber-empathetic by default in their interactions with students and thus try to survive only off rapport.

6.2.4 Halfway teacher types

The Defeated Teacher.

This teacher prototype was perhaps the one that evoked the most consistent description: the focus group participants described it as the teaching equivalent of learned helplessness. Mentally and emotionally, these teachers are broken and disillusioned about the profession at large and with their failure to beat the system. They are profoundly discouraged by the repeated experience of failures and frustrations they have been through. The experiences of teachers in this prototype

have reinforced their attitudes of hopelessness that fuel their sense of defeatism. Most focus group participants agreed that:

These are teachers who used to care, but they are now at the point where they'll say "yes, but we've tried that a hundred times and it can't be done". They've somehow had the experience of trying to do something and getting rejected or reprimanded every time, so they just throw their hands up in disgust and walk away from it all. (focus group 2, P3)

Teachers in this prototype were seen as having abandoned the fight and resigned themselves to passivity, and participants described their tendency to come into the classroom everyday defeated and with their heads down—as if the system had already won. These teachers are simply at the end of their rope.

To compound this, they are so utterly demoralized by the rejection and lack of support they have experienced that they have given up even trying to make a difference anymore. They have been worn down to the point where they have stopped sticking their necks out. Instead they come to focus entirely on avoidance and self-protection because their experience tells them it is the only thing that will pay off. This notion is echoed in the following extract from one focus group.

A lot of teachers start out excited and passionate. But then they see the system recycle itself, and they keep hearing the same things on repeat until they're sick of it. They think 'If I can just go into the classroom and do the bare minimum and still get paid and create less hardship for myself, then why try anymore if I've tried and it didn't work?' It's just not worth it. (focus group 3, P7)

They have completely lost their sense of wonder for teaching, and most are aware that something has gone terribly off the tracks in their career. With this realization comes a feeling of dejection at having “lost part of their souls as teachers” (focus group 4, P4).

The Poseur.

Many of the focus group participants described this teacher prototype as “a colleague’s worst nightmare” (focus group 2, P7). These teachers are seen as cynical and narcissistic, are often on a power trip, and only got into teaching initially for its self-aggrandizing aspects. One particular account given by a participant highlights this.

One of my remedial students explained to me how she had to drop a class entirely because she challenged a teacher for writing the wrong answer on the board. The teacher became openly hostile to her because she had caused him to lose face in front of the whole class. (focus group 1, P5)

Teachers in this prototype are distrustful of others intentions and walk around with a chip on their shoulder. While interacting with peers they are often argumentative simply on principle, and will challenge suggestions and get angry and defensive in response to criticism. One focus group participant remarked that they think and behave as if:

[t]hey’ve been around the block a few times, and this isn’t their first picnic, and they’re determined to let you and everyone else know it. But if you

approach them without a solid rationale, then you will get into a stand off, and you will be stuck digging yourself out of a hard place. (focus group 4, P7)

They exhibit antagonism and hostility to newness and change, and this stubbornness can border on conceit when they are confronted by others.

Because they tend to be loners in the workplace, they were perceived as not being able to work well with others or negotiate or take advice well. In the words of another focus group participant:

They are a royal pain in the neck to work with because they seem to be in their own little world. There is absolutely nobody who likes or respects them for it. (focus group 1, P3)

They can be perceived as boastful and arrogant by acting as if they have seen it all before, but they remain shockingly unaware of how much this antagonizes others. Despite their indignant response to others' suggestions about their own teaching effectiveness, they are seen as highly opinionated and overly critical of things they perceive as inadequacies of others. They are also quick to place the blame on others when something goes wrong.

The Striver.

The focus group participants described this teacher prototype as diligent, conscientious and well-intentioned, but nevertheless one who still feels like there is an inexplicable something they are missing as teachers that remains just out of their reach. Participants considered these teachers as being stuck in an existence that is an eternal quest for the "holy grail of teaching" (focus group 3, P5) which only a select

few seem to have achieved. They have an even mix of good and bad days and wonder what that elusive something is which some teachers seem to have but that they do not. Teachers in this prototype do of course experience moments of sunshine within all the hardships and these keep them going, but they question why these moments are so few and far between. They feel that being a teacher has the potential to be rewarding and so they are determined to overcome despite the struggle. The following focus group excerpt provides one example of how teachers in this prototype try to mentally explain this tension.

Devoting your life to students is very meaningful, so even though dedicating all your time and energy might mean you have no energy left to sustain your own life, searching for meaning in this way can be very rewarding. (focus group 2, P6)

Because they accept that there are things in the profession that must simply be endured, they soldier on even though it is painful. Despite their belief that there is a certain elusive quality they have yet to attain and must strive toward, they are seen as putting on a show of strength even when it is only partly true. As one participant said:

When faced with challenges at school these teachers may grin and bear it, or show some form of unconditional optimism. But attempting to hide underlying issues from students can backfire if these emotions spill over. This will only confuse and hurt the students and damage the work done to develop the class dynamics. (focus group 3, P9)

Emotionally, they may feel that some days are mostly about damage control, but they subscribe to the belief that a measure of unhappiness is present for all teachers.

Although they may have wanted to quit before, they now feel there is something to be gained from staying; thus, for them, if language teaching is a job that must be done, it ought to be done well.

6.2.5. Key lessons from the first phase of validation

First, what was remarkable about this phase of the validation study was that not only were all the focus group participants readily able to relate to the metaphor of language teacher immunity, they were also able and even eager—through collaborative brainstorming—to systematically construct and elaborate the characteristics of a full spectrum of prototypes. Furthermore, these participants had very little difficulty calling to mind particular teacher colleagues they worked alongside at the time, or had worked with prior to that, who fit the description of the various prototypes being elaborated. Each of the nine prototypes that emerged from the data analysis fit within one of the more global outcomes of teacher immunity previously outlined, and of these more global outcomes, the halfway type is noteworthy. This is because, even without invoking a developmental perspective or inviting participants to reflect on prototypes' processes of becoming in the focus group interviews, this halfway outcome substantiates the dynamic nature of the teacher immunity construct. Teacher immunity outcomes that have developed only partially in either the productive or maladaptive direction provide evidence for different stages in its emergence, and in this early phase lend hope to the possibility for change and redressing an imbalance in its outcome. If it is possible to “catch” a prototype midway through its developmental stages, there is potential to intervene in that development and perhaps nudge it in a more productive direction.

Thirdly, while this phase of the validation RQM study was only an initial attempt to identify the most salient types of language teacher immunity within each of the global types, to some extent its findings went beyond the notions of “what is there” and “what it looks like”, into the realm of “how it manifests itself” and “what it does”. One peculiar aspect here about asking teachers and teacher educators to talk in a focus group at length about other teachers, and to expound on and analyze their characteristics, is that all the participants were able to take both a first- and third-person perspective simultaneously. While this certainly lends itself to richer data, it also raises the question of whether any of the participants recognized themselves in the teacher immunity prototypes being built and elaborated on, and if so whether this influenced the direction they pushed the focus group in. These data elicited suggested possibilities for how teachers in these prototypes interact with professional colleagues and students alike, construe their sense of self, and confront difficulties in their classroom practice—i.e., for how teacher immunity is implicated in issues such as teacher identity, motivation, and emotion. Taken together, these indicators are promising for the agenda of the RQM study, namely to validate the construct of teacher immunity.

6.2.6 Interim summary

The data collected and analyzed from the focus group interviews revealed nine preliminary teacher immunity prototypes that can be divided into one of four main categories: (a) teachers with a robust and productive teacher immunity (i.e., productively immunized teachers); (b) teachers who have developed the maladaptive, converse outcome of autoimmunity (i.e., autoimmunized teachers); (c) teachers who

have developed halfway features of either a productive or a counterproductive immunity (i.e., teachers with partial immunity/autoimmunity); and, (d) teachers who have not developed any coherent form of teacher immunity (i.e., immunocompromised teachers). While the focus group data provided clear and elaborate teacher immunity prototypes with phenomenological validity, in order to make any broader reaching claims it became imperative to validate these emergent prototypes in a larger sample of language teachers to ascertain whether teachers like this do in fact exist. Thus, cluster analysis of a larger quantitative data set was used in order to offer this measure of validation to the core teacher immunity prototypes that emerged from the focus group data. I report the findings from this cluster analysis phase in the next section.

6.3 Validation Study II: Corroborating Core Teacher Immunity

Archetypes

6.3.1 Triangulating with previous validation phases

In this phase of the RQM validation study (which I refer to here as study 2), cluster analysis data from a sample of 293 L2 teachers was matched and triangulated with the initial nine focus group prototypes to confirm which of these language teacher immunity outcomes could be validated and confirmed. In matching the prototypes from the focus group data set to the validated cluster solution manually, it is necessary to keep in mind that cluster analysis is an exploratory type of multivariate data analysis, and may result in somewhat arbitrary clusters unless used critically. As mentioned previously, all the focus group data were analyzed and coded theoretically (i.e., based on seven relevant theoretically-grounded constructs/variables); this was not only to provide a theoretical rationale for the questionnaire administered to the larger sample of teachers, but also to ensure that links were established systematically between the phases of data collection and that the clustering variables were in fact parallel to those which were used for descriptive classification of the focus group data.

From this cluster analysis, a more limited range of six robust, core language teacher immunity archetypes were corroborated in this sample of L2 practitioners. One previously untapped halfway type emerged, but due to the lack of corresponding type in previous data sets it was not explored further. Throughout this and the following sections of the results and discussion, I refer to these corroborated teacher types encountered here in the second and third stage of the validation studies (i.e., study 2 and study 3) as *archetypes* to indicate that they serve to illustrate the typical

qualities of that teacher immunity outcome. The strong match between the initial focus group data and the cluster analysis data suggests that these six core archetypes are likely to be highly salient in many language teaching contexts and thus almost instantly recognizable. A summary of the within cluster composition for the final seven-cluster solution is presented in Table 6. The cluster size and cluster membership are arranged based on gender, workplace (i.e., primary, lower-secondary, or upper-secondary school), and years in the L2 teaching profession. Cluster density (i.e., the number of cases assigned to a particular cluster) follows random size distributions (see e.g., Chiang & Mirkin, 2010), with the size ratio (i.e., the ratio between the largest and smallest cluster sizes) approximately 10:1. I report on these seven clusters in more detail below after outlining the validity measures for the final cluster solution.

Table 6. Composition of Clusters for the Final Seven-cluster Solution

	Cluster 1		Cluster 2		Cluster 3		Cluster 4		Cluster 5		Cluster 6		Cluster 7		Sum	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>N</i>	%
Total	24	8.2	75	25.6	35	11.9	45	15.4	43	14.7	7	2.4	64	21.8	293	100
female	18	7.4	61	24.9	31	12.6	36	14.5	41	16.8	7	2.8	51	21	245	83.6
male	6	12.5	14	29.2	4	8.3	9	18.7	2	4.2			13	27.1	48	16.4
Workplace																
primary	5	20.8	11	14.6	6	17.1	24	53.3	7	16.2	2	28.5	12	18.7		
L-secondary	13	54.2	20	26.7	19	54.4	7	15.5	23	53.4	5	71.5	23	36		
H-secondary	6	25	44	58.7	10	28.5	14	31.2	13	30.4			29	45.3		
Experience																
< 1 year			5	6.6	2	5.7							7	10.9		
1 – 2 years	3	12.5	9	12	4	11.4			4	9.3			7	10.9		
3 – 4 years	2	8.3	19	25.4	10	28.5	11	24.4	16	37.2			20	31.2		
5 – 7 years	4	16.7	19	25.4	6	17.2	7	15.5	7	16.3	7	100	11	17.1		
8 – 10 years	9	37.5	9	12			4	8.9	9	20.9			5	7.8		
11 – 15 years	6	25	11	14.6	2	5.7	14	31.2	7	16.3			10	15.6		
16 – 19 years			3	4	5	14.3	6	13.3					4	6.5		
> 20 years					6	17.2	3	6.7								

Note. Cluster 4 could not be corroborated from the focus group data (i.e., it shared partial characteristics with multiple types) and was not included in subsequent analyses. The percentages for gender in cluster composition sum horizontally to 100%, while the percentages for workplace and experience in respective clusters sum vertically to 100%.

The validity of this final seven-cluster solution was established by first examining the univariate main effects and conducting pairwise comparisons of each cluster using Tukey's HSD post-hoc test (Table 7). A one-way multivariate analysis of variance (MANOVA) yielded a significant multivariate main effect for the independent variable cluster membership in the seven-cluster solution, Wilks' $\lambda = .345$, $F(12, 570) = 33.36$, $p < .0005$, partial $\eta^2 = .413$, power = 1.0. Significant univariate main effects for cluster membership were also obtained for the criterion variables coping, $F(6, 286) = 68.17$, $p < .0005$, partial $\eta^2 = .589$, power = 1.0; as well as for burnout, $F(6, 286) = 33.21$, $p < .0005$, partial $\eta^2 = .411$, power = 1.0. Table 8 shows the within-group means and standard deviations for these criterion variables. These results indicate that when compared against the variables coping and burnout, the seven-cluster solution was the most meaningful way of partitioning the multivariate dataset.

Table 7. Univariate Analysis of Variance Comparing Mean Scores on Clustering Variables

	Cluster 1	Cluster 2	Cluster 3	Cluster 5	Cluster 6	Cluster 7	<i>df</i>	Tukey's post-hoc tests	<i>F</i> -value/ <i>p</i>	η^2
Teaching Self-efficacy	5.83	4.60	4.14	3.98	2.00	3.75	6	6 < 7, 5, 3 < 2 < 4 < 1	103.1/.0001	.68
Resilience	5.54	4.95	4.17	3.26	2.57	3.88	6	6 < 5 < 7, 3 < 4, 2 < 1	72.1/.0001	.60
Attitudes Toward Teaching	4.67	4.83	4.34	3.21	1.00	3.67	6	6 < 5, 7 < 3, 1, 4, 2	50.2/.0001	.51
Openness	5.08	4.00	3.00	2.67	3.29	4.02	6	5, 4 < 3, 6 < 2, 7 < 1	217.6/.0001	.82
Classroom Affectivity	5.54	4.99	4.46	3.53	2.00	4.11	6	6 < 5 < 7, 3 < 2, 4 < 1	97.7/.0001	.67

Note. All measures were assessed on a 6-point semantic differential scale from 1 (strongly disagree) to 6 (strongly agree).

Table 8. Means and Standard Deviations for the Seven Cluster Groups on the Criterion Variables

	Cluster 1 (<i>n</i> = 24)		Cluster 2 (<i>n</i> = 75)		Cluster 3 (<i>n</i> = 35)		Cluster 5 (<i>n</i> = 43)		Cluster 6 (<i>n</i> = 7)		Cluster 7 (<i>n</i> = 64)		Combined	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Coping	5.46	.50	4.72	.45	4.11	.47	3.72	.54	2.29	.48	4.06	.53	4.36	.76
Burnout	4.92	.77	4.07	.75	3.60	.88	2.88	.69	1.71	.48	3.22	.62	3.60	.97

Note. All measures were assessed on a 6-point semantic differential scale from 1 (strongly disagree) to 6 (strongly agree).

Following this, a multinomial logistic regression was performed to evaluate the relative predictive importance of the external validity measures coping and burnout on cluster membership for respective clusters. The overall model indicated a good fit ($-2 \log\text{-likelihood} = 165.43$, $\chi^2 = 295.5$, $df = 54$), which was statistically significant at $p = .0005$. The resulting differences between the final model and a reduced model were also assessed by the likelihood-ratio test (Table 9).

Table 9. Likelihood Ratio Test

	-2 log likelihood of reduced model	χ^2	<i>df</i>	<i>p</i>
Coping	364.703	199.265	24	.000***
Burnout	227.902	62.464	30	.000***

Note. *** $p < .0001$

Both of these predictor variables were statistically significant at the $p < .0005$ level, indicating that clusters differed meaningfully on each of the individual criterion measures. The Nagelkerke's pseudo- R^2 for this model was 0.65, which indicates a moderately good model fit. Finally, classification accuracy, which compares predicted group membership based on the logistic model to actual group membership, was used to assess the model's predictive utility. The conventional benchmark adopted to characterize a fully useful multinomial logistic regression model is a 25% improvement over the proportional by-chance rate of accuracy. The proportional by-chance accuracy criterion was 25.5% ($1.25 \times .205 = 25.5$). The classification matrix (Table 10) indicated that that 48% of the cases in the sample were correctly classified

into the seven clusters. While this classification accuracy falls two percentage points short of the recommended 25% improvement mark, it is, nevertheless, within acceptable levels and marks a significant improvement over the proportional by-chance accuracy rate. Noticeably, the two least accurate clusters (i.e., Clusters 4 and 7 with only 31.1% and 32.8% of members correctly classified respectively) correspond to halfway teacher immunity outcomes, and the partial characteristics of multiple global outcomes are likely to have a confounding effect on the accuracy of case classification.

6.3.2 Core language teacher immunity archetypes

As mentioned previously, in this stage of the RQM validation study I manually matched and triangulated the initial nine focus group prototypes with the seven-cluster solution that emerged. Six language teacher immunity archetypes were corroborated in this sample of L2 practitioners. In addition, one previously untapped halfway type emerged. Figure 6 provides a visual profile of characteristics (i.e., the clustering variables) for each cluster in the final seven-cluster solution.

Table 10. Analysis of Classification Accuracy for Seven-cluster Solution

Actual Group	Predicted Group							% Correct
	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5	Cluster 6	Cluster 7	
Cluster 1	11	11	0	2	0	0	0	45.8%
Cluster 2	0	53	7	5	2	0	8	70.7%
Cluster 3	0	8	14	0	7	0	6	40.0%
Cluster 4	0	23	0	14	3	0	5	31.1%
Cluster 5	0	0	4	2	22	0	15	51.2%
Cluster 6	0	0	0	0	0	7	0	100.0%
Cluster 7	0	3	18	8	14	0	21	32.8%

Note. Percentage of correctly classified cases = 48.5%. Random chance rate = 25.5%.

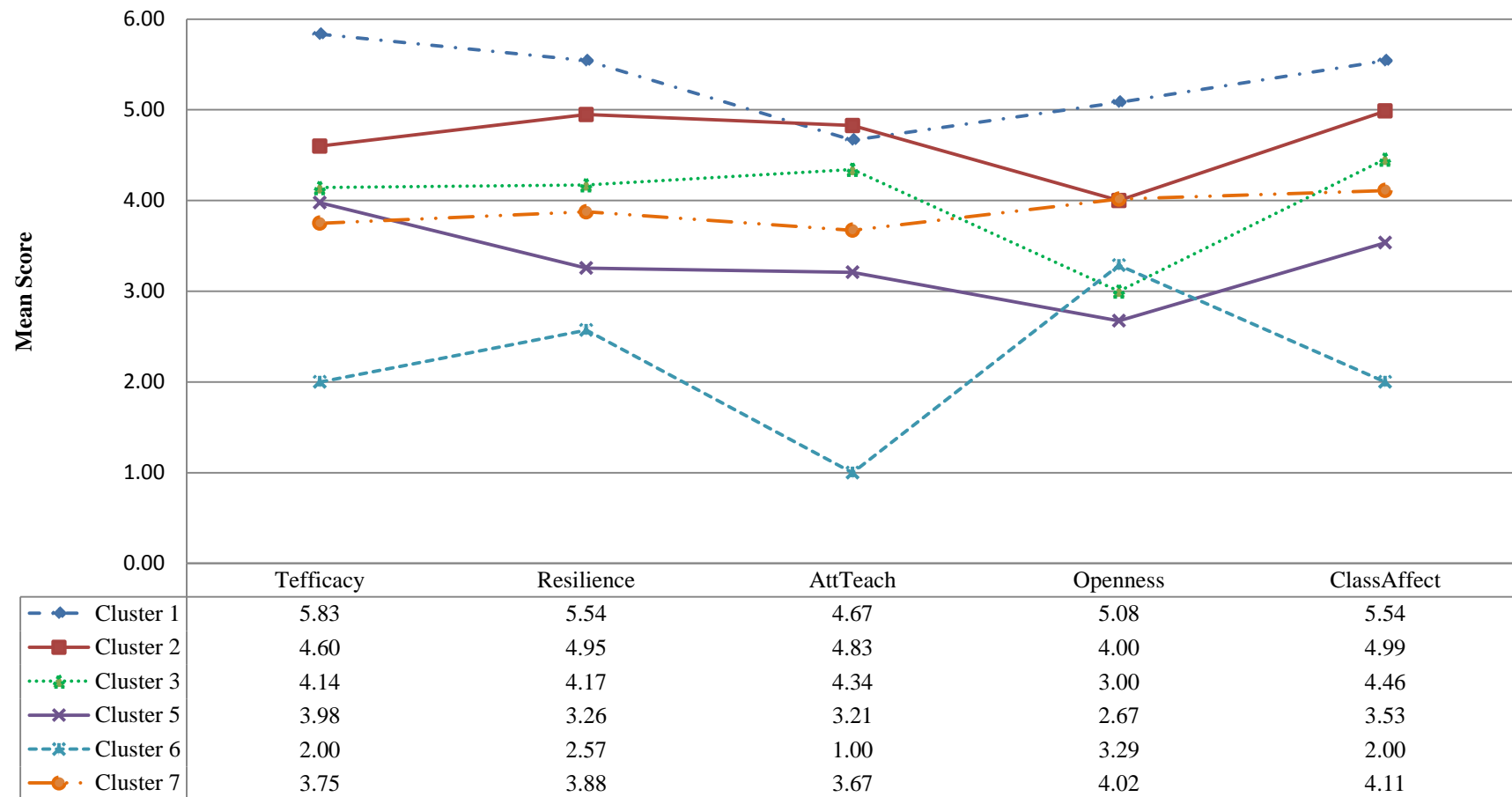


Figure 6. Line graph profile of cluster characteristics based on clustering variables

Two distinct productively immunized teacher archetypes (Cluster 1 and 2) emerged from the final cluster solution. The teachers in Cluster 1 ($n = 24$) were found to correspond with the qualitative characteristics of the *Visionary* teacher immunity archetype. As can be seen in Table 7, this cluster had the highest levels ($M > 5.0$) of openness, teaching self-efficacy, resilience, and positive classroom affectivity. The level of their attitudes toward teaching was second only to the teachers in Cluster 2. Table 6 shows that the teachers in Cluster 1 were concentrated mainly in the lower-secondary workplace (54%), with the remaining teachers split evenly from primary and upper-secondary schools. Over 62% of teachers in this cluster had upwards of eight years of L2 teaching experience, but as many as 20% of them had four years of experience or less. Table 8 illustrates that teachers in Cluster 1 reported very high levels on both the criterion measures of coping and burnout.

Cluster 2 ($n = 75$) was the largest cluster, and was found to correspond with the qualitative characteristics of the *Spark Plug* teacher immunity archetype. The teachers who made up this cluster measured highly on all the clustering variables (see Table 7) and reported the most positive attitudes towards teaching of any cluster. Table 8 indicates that levels of both criterion variables (i.e., coping and burnout) were also high in this cluster. While its lowest measure among the clustering variables was for openness ($M = 4.0$), this was still the joint second-highest level of openness among all clusters. As can be seen in Table 6, approximately 51% of teachers in this cluster reported teaching experience of between three and seven years; However, up to 18% of cluster members reported two years or less in the profession. This cluster had the highest percentage of upper-secondary school teachers of all clusters (58%) and the lowest of primary school teachers (14%).

At the maladaptively immunized end of the spectrum, were Clusters 3 and 6. Cluster 3 was found to correspond to the qualitative characteristics of the *Fossilized* teacher immunity archetype. Table 7 shows that the teachers in Cluster 3 ($n = 35$) reported moderately-low levels on each of the clustering variables, with its lowest measure ($M = 3.0$) among the clustering variables in openness. The criterion variables seen in Table 8 additionally indicate low levels of coping combined with high levels of burnout. As summarized in Table 6, teachers in this cluster appear to be concentrated more within the secondary school workplace (82%), with only 17% coming from the primary school sector. Approximately 37% of teachers in this cluster were in the mid-to-late stages of their career with upwards of 11 years of classroom experience. In contrast to this, however, cluster membership also includes 45% of teachers with 4 years or less of teaching experience, which may suggest that for some teachers, settling into this archetype is either extremely rapid, or is influenced by the initial conditions of their teacher identity (i.e., their apprenticeship of observation)—ideas I explore below.

Cluster 6 ($n = 7$) was the smallest cluster and stabilized as early as a three-cluster solution. This cluster was found to correspond to the qualitative characteristics of the *Sell-out* teacher immunity archetype. Table 6 shows that this cluster of seven female teachers each had between five and seven years of teaching experience. Two of the teachers in the cluster were from the primary school workplace, while the remaining five worked in lower-secondary schools. None of the teachers in this cluster were from upper-secondary schools. As can be seen in Table 7, teachers in Cluster 6 had by far the lowest levels of all the clustering variables, apart from openness which was still below the sample mean. Attitudes toward teaching (M

= 1.0) were in sharp contrast to those of the two productively immunized teacher clusters ($M > 4.5$). With regard to the two criterion variables, Table 8 illustrates that the seven teachers in Cluster 6 reported the lowest coping and burnout levels of all ($M \leq 2.5$).

Cluster 7 ($n = 64$) was found to correspond to the qualitative characteristics of the immunocompromised *Overcompensator* teacher immunity archetype. As can be seen in Table 7, the teachers in Cluster 7 reported a high level of openness ($M \geq 4.0$), combined with low to moderate levels of all the other clustering variables: teaching self-efficacy, classroom affectivity, resilience, and attitudes toward teaching.

Regarding the criterion measures, Table 8 shows that relatively low coping levels were combined with moderate levels of burnout, comparable to Cluster 3 in this regard. Although the largest number (53%) of teachers in this cluster reported having spent four years or less in teaching, the demographic data summarized in Table 6 indicate an additional 22% had more than a decade of teaching experience. This may indicate that experience alone is not an accurate indicator of whether or not a given teacher will ultimately develop an outcome of teacher immunity. Teachers in this cluster were split most proportionately of all clusters between the three representative workplaces (i.e., primary, lower-secondary, and upper-secondary schools).

Cluster 5 was found to correspond with the qualitative characteristics for the halfway outcome of the *Defeated* teacher immunity archetype. Table 7 shows that the teachers in Cluster 5 ($n = 43$) had low levels on every single clustering variable. Their levels of resilience were particularly low ($M \geq 3.0$), second only to Cluster 6. With regards to openness, teachers in this cluster reported the lowest levels of all clusters ($M \geq 2.5$). The criterion measures of coping and burnout, as summarized in Table 8,

were also low in this cluster, ranking second to last behind Cluster 6. Of teachers in this cluster, Table 6 illustrates that 83% worked in either lower-secondary or upper-secondary schools. Roughly 74% of teachers in this cluster had between three and 10 years of experience, and—as with Clusters 1 and 6—there were no teachers in this cluster with more than 15 years of experience. This demographic spread suggests that teachers who find themselves in the *Defeated* teacher immunity archetype either manage to find a way to turn things around, join the ranks of another archetype by developing another variation of teacher immunity, or ultimately leave the profession.

The data for Cluster 4 suggests a separate archetype (i.e., one that accounts for 15% of participants in the dataset), not revealed in the focus groups, but one which I have decided to report briefly for reasons of transparency before leaving it behind for good. This stand-alone cluster could be said to share partial characteristics of one halfway type which emerged from the focus group data (the Poseur prototype). Apart from relatively low levels of openness ($M \leq 3.0$), the teachers in this cluster measured moderately-high in every single clustering variable ($M \geq 4.5$). They also reported high levels of the criterion measures coping and burnout. Along with the other types not corroborated from the two phases of data, this cluster may not have shown up precisely because it was a halfway type, meaning that developmentally it shared partial characteristics with more than one fully immunized archetype. While ideally, any researcher would hope that the process of corroboration through step-wise validation studies might be entirely without incident (i.e., that each teacher type would emerge at every stage and no outliers would emerge), my experience here reflects the reality of using these exploratory research designs. The strength of using cluster analysis as an exploratory method is in its ability to categorically separate

participants from others that differ with regards to certain multivariate qualities. It is not, however, well suited to tracing development or to piecing apart nuances of dynamic change. To maximize the robustness of the subsequent interview phase, I chose to explore only the six archetypes I was able to corroborate from the focus group data in this cluster solution (see Figure 7 below).

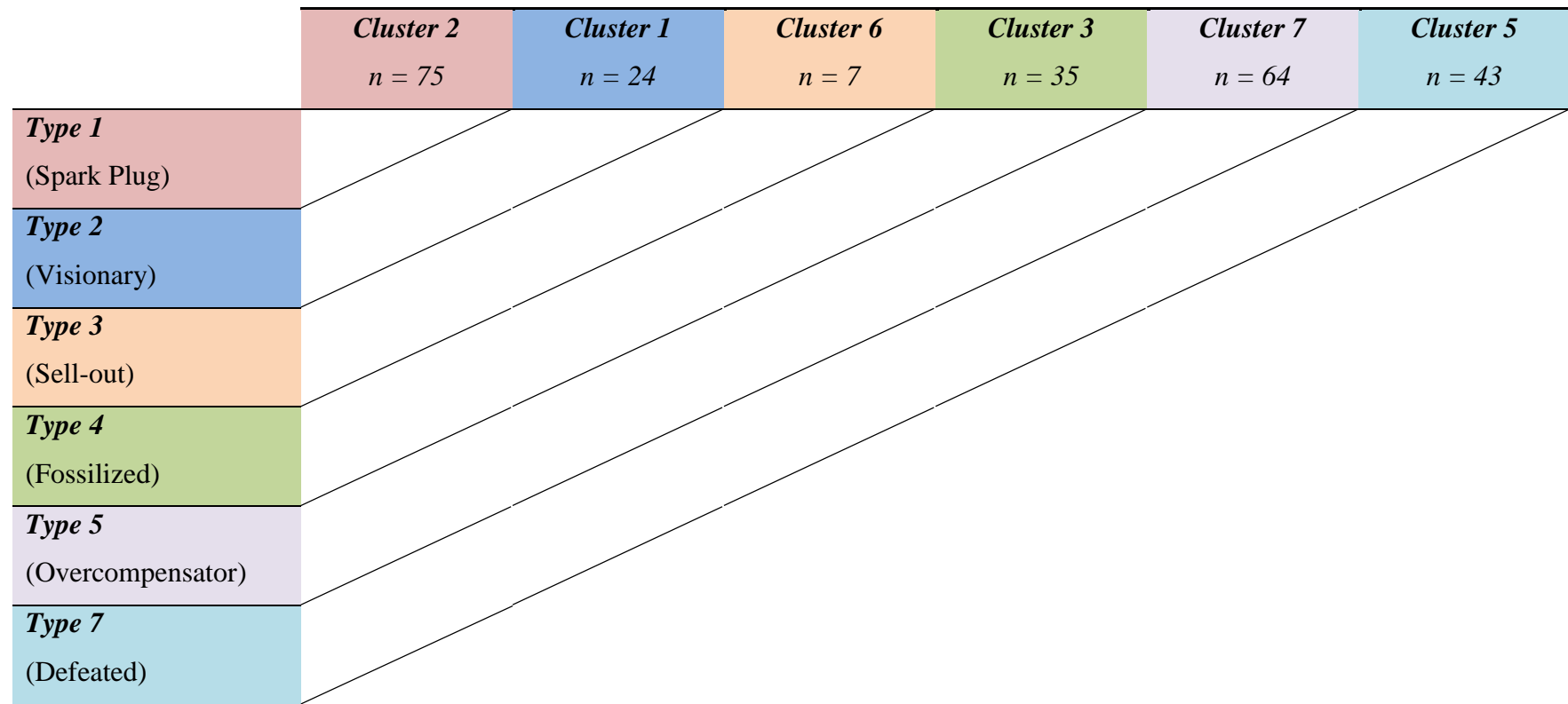


Figure 7. Correspondences of focus-group prototypes and quantitative clusters

6.3.3 Profiles of language teacher immunity

Cluster 1, the cluster found to most closely correspond to the *Visionary* archetype (hereafter *Visionary cluster*) accounted for approximately 12% of the sample of language teachers. This Visionary cluster could be characterized as L2 practitioners who had extremely positive attitudes toward language teaching as a career, and who not only approached their practice with exceptionally high levels of teaching self-efficacy but also exhibited a tremendous positive emotionality in their L2 classroom practice. Their openness to change was unparalleled, and despite the unexpectedly high levels of burnout they experienced, they possessed remarkable coping skills and an equally robust resilience. The distribution of number of years in the profession for teachers in the Visionary archetype—over 62% of teachers with upwards of eight years of L2 teaching experience, and an additional 20% with between one and four years of experience—indicates that although many in the Visionary cluster are more experienced and have seen their share of L2 classrooms and students, this language teacher immunity outcome is not reserved exclusively for the most experienced of L2 teachers. That teachers with as few as one or two years of experience can develop this outcome of language teacher immunity is encouraging news indeed, and it raises the immediate questions of how these teachers have developed into this Visionary archetype, and whether the conditions under which this development took place can also be recreated for others.

Cluster 2 accounted for approximately 26% of the sample of language teachers—the largest proportion of any cluster—and was the cluster found to most closely correspond to the Spark Plug archetype (hereafter *Spark Plug cluster*). In direct comparison to the somewhat off-the-chart qualities of teachers in the Visionary

cluster (i.e., the other productive language teacher immunity outcome), these teachers display some distinct strengths but are still mere mortals. This Spark Plug cluster could be portrayed as language educators with both a very positive emotional demeanor in the classroom, and a particularly strong emotional commitment to the L2 teaching profession. They possess strong teaching self-efficacy and have considerable coping skills and a solid resilience, despite experiencing moderately high levels of burnout. To complement their strong positive affectivity, teachers in the Spark Plug archetype have an openness to change which indicates that even though they are confident L2 practitioners, they are on the lookout for new ideas and are receptive to taking these on board in their practice. The Spark Plug cluster is composed of upwards of 80% language teachers from secondary classroom settings, and is represented in every band of teaching experience apart from the more-than-20-years category. There are an equal number (i.e., 18%) of L2 teachers in the Spark Plug archetype with two years of experience or less as there are those with experience of between 11 and 19 years. Fifty-one percent of teachers in the Spark Plug cluster, however, had between three and seven years in the profession. This may indicate several things: teachers are able to develop this outcome of immunity fairly rapidly and may also remain this way well into the second decade of their careers, but the majority of teachers in the Spark Plug archetype are those who have hit their stride and are either beginning or established in the middle of their careers.

Moving now to the maladaptively immunized end of the spectrum, Cluster 3, the cluster found to correspond most closely to the Fossilized archetype (hereafter *Fossilized cluster*), accounted for an additional 12% of the L2 teachers in the sample. This Fossilized cluster could be described as L2 teachers with an ambivalent attitude

to teaching as their profession of choice, and perhaps tolerable, if somewhat nondescript, levels of classroom affectivity. They experience moderate to high burnout, but possess an extreme averseness to change. These characteristics, coupled with mediocre teaching self-efficacy, undistinguished coping skills and resilience, on the whole point to the profile of a language teacher who is coasting and reluctant to do anything of much impact. Commonsense may dictate that teachers who make up the Fossilized cluster are those in the later stages of their careers, and 31% of teachers in this cluster were indeed those with 16 years and above of classroom experience. Nevertheless, 45% of L2 practitioners in the Fossilized archetype were those with under 5 years of experience. More than any other archetype, the combination of such low openness to change at such an early stage of a teaching career may indicate that many of these teachers entered the profession already hostile to newness, or that they quickly settled into this pattern of apathy which neither their low levels of teaching self-efficacy, coping skills, or resilience could spur them to reject. It is likely that for the teachers in the Fossilized cluster who were in the later stages of their career, this solidified over the long years of experience they had.

Cluster 6 accounted for approximately 2% of the sample of language teachers—by far the smallest proportion of any cluster—and was the cluster found to most closely correspond to the Sell-out archetype (hereafter *Sell-out cluster*). If the Visionary cluster were the ideal L2 teacher immunity outcome, then this archetype might be described as the polar opposite. The teachers in the Sell-out cluster could be characterized as having little to no teaching self-efficacy, and both possessing extraordinarily negative attitudes towards teaching as a career and exhibiting darkly negative affect in their classroom practice. Additionally, the openness to change in

teachers who comprise the Sell-out archetype was strikingly low. They experience virtually imperceptible levels of burnout, and their coping skills and resilience are, in any case, negligible. What is perhaps notable is the experience category that these seven teachers represent: they all have spent between five and seven years in the profession. What this may indicate is that, unlike the Fossilized archetype which—for one or more reasons—may manifest itself from the very earliest stages of one’s professional lifespan, the Sell-out archetype is one that develops more slowly and may even manifest itself as the eventual outcome of other halfway types of teacher immunity. Although approximately 40% of the participants in this stage were high school teachers, for reasons that are unclear from the data set, none of the L2 practitioners in the Sell-out cluster were teachers in upper secondary classrooms.

Cluster 7, the cluster found to correspond most closely to the Overcompensator archetype (hereafter *Overcompensator cluster*), accounted for a full 22% of the language teachers in the sample. This is surprising simply because it is the one immunocompromised archetype, and this percentage implies that a sizeable portion of the language teaching profession may not develop any appreciable form of protective teacher immunity—whether productive or maladaptive. Teachers in the Overcompensator cluster might be seen as those who have unremarkable levels of teaching self-efficacy, conventional though somewhat average attitudes toward teaching as a career, and moderately low classroom affectivity. On the whole, they could be said to experience modest levels of burnout, although their resilience is inferior and their coping skills leave much to be desired. The one conspicuous quality of the Overcompensator archetype is a level of openness to change rivaling that of teachers in the Spark Plug cluster. This unique combination suggests a teacher that is

actively searching so as to compensate—hence the name—for a perceived lack of something. Perhaps not surprisingly, practitioners in the Overcompensator cluster were grouped more toward the low end of experience, with 78% in their first decade of language teaching experience. However, the remaining 22% who were in their second decade of classroom practice may also provide evidence that, by itself, the number of years of experience may not determine whether teachers actually do settle into a fully-fledged outcome of language teacher immunity.

Finally, Cluster 5 accounted for approximately 15% of the sample of language teachers, and was the cluster found to most closely correspond to the Defeated archetype (hereafter *Defeated cluster*). Teachers in the Defeated cluster, itself a halfway teacher immunity archetype, could be most aptly described in terms of vulnerability and apparent gaps. They possessed not only the absolute lowest openness to change, but they were also missing any form resilience. As L2 professionals the Defeated archetype has little teaching self-efficacy, but to make matters worse possesses prominently pessimistic attitudes toward teaching as a career and exhibits a negative classroom affect that is rivaled only by teachers in the Sell-out cluster. While their coping skills are uncommonly low, these are combined with what can only be thought of as non-significant levels of burnout. None of the teachers in the Defeated cluster have more than 15 years of classroom experience, but those with as few as one or two were also part of this cluster. As I have suggested above, this demographic spread might indicate that L2 practitioners who develop this halfway archetype of teacher immunity either develop an alternative, and fully-fledged, variation of teacher immunity or ultimately decide that teaching is not for them.

6.3.4 Key lessons from the second phase of validation

Having examined what the profile of each language teacher immunity cluster means in concrete terms, I now extend into a more focused discussion of the findings from this dataset. One key finding from this stage was the central nature that openness played in determining the cluster membership. Table 7 shows that each of the clustering variables were significant contributors to the cluster solution, and the general recommendation is that variables with an effect size (i.e., η^2) of less than .50 not be included as clustering variables given their insubstantial contribution to cluster membership. However, the univariate analysis of variance combined with post-hoc tests, also illustrated that it was the variable openness to change which accounted for 82% of variance in cluster membership. This suggests that, all other things being equal, one critical measure of the teacher immunity archetype that a language teacher has settled into may be their level of openness to change and newness. Openness to change may not be the only meaningful factor in determining the outcome of teacher immunity that a language teacher has developed, and a combination of the other variables provides a fuller picture of the individual teacher immunity profile. However, given the nature of the language teaching profession—success in which often requires a healthy dose of innovation, creativity, and experimentation—openness to change may be a relative marker of how productive the archetype of teacher immunity is that any given teacher has settled into. This was certainly borne out in the above comparison of teachers in the productively immunized clusters and those in the maladaptively immunized clusters, as the post-hoc tests in Table 7 illustrate the difference between the former's (i.e., higher) levels of openness to change and the latter's (i.e., lower) was statistically significantly.

One rather unexpected result from this stage of validation was the elevated level of burnout experienced by these teachers overall: the symptoms of stress and burnout ranged from moderately high to very high for teachers in each cluster, with the exception of the Sell-out archetype and the Defeated archetype. In fact, burnout levels were highest of all in the two productively immunized teacher immunity outcomes. This may point, first, to a structural condition of the profession, especially because L2 practitioners teaching in compulsory K-12 settings may experience more pressure from regular mandated assessments and administrative work than those teaching in less formal settings. Furthermore, and particularly when viewed in combination with other factors such as resilience, coping skills, and teacher self-efficacy, the high level of burnout may be an indicator of different teacher immunity archetypes' varying levels of ability to function productively. Put more simply, despite high levels of burnout, L2 teachers who are productively immunized—in comparison to those in either the maladaptively archetype of teacher immunity or in halfway types—would be expected to remain resilient and able to cope with setbacks, efficacious, open to change, and emotionally positive and buoyant. This was indeed that case for both the Visionary and Spark Plug teacher immunity archetypes.

6.3.5 Interim summary

This phase was the second of three within an RQM study designed to validate the construct of language teacher immunity. In this phase, as with the previous, the main aim was to identify the archetypical outcomes in which language teacher immunity manifests itself. In order to corroborate the focus group prototypes of teacher immunity and the characteristic profile of each, existing measurement

instruments for seven theoretical constructs found to be a well-defined part of each focus group prototype (i.e., *teaching self-efficacy; resilience; attitudes to teaching; openness; classroom affectivity; coping; burnout*) were adapted to construct a questionnaire that was administered to a sample of 293 public sector L2 teachers in Korea. This dataset was cluster analyzed, and the cluster solution from this phase was systematically examined for correspondence with the qualitative characteristics of the focus group types. The two-step cluster analysis and its validation measures indicated a core of six language teacher immunity archetypes corroborated from the focus group data. These six archetypes were divided across all of the possible global teacher immunity outcomes (see Table 11).

Table11. Corroborated Teacher Immunity Archetypes through Focus-groups and Cluster Analysis

<i>Teacher Immunity global type</i>	<i>corroborated archetype</i>
Productively Immunized Outcome	The Spark Plug
	The Visionary
Maladaptively Immunized Outcome	The Sell-out
	The Fossilized Teacher
Halfway Immunized Outcome	The Defeated Teacher
Immunocompromised Outcome	The Overcompensator

Having corroborated the existence of these six phenomenological archetypes of language teacher immunity—the key first step in the RQM sequence—I turned to exploring the underlying dynamic patterns and trajectories that each archetype produces, i.e., what Dörnyei (2014) has termed the “system’s signature dynamics” (p. 87). In my initial exploratory case study, the developmental process leading to the emergence of language teacher immunity was shown to follow a self-organized sequence of four stages—triggering, linking, realignment, and stabilization. What remained uncharted, are the individual trajectories or pathways of development for each of the particular outcomes. It was also hypothesized that, in each case, the teacher immunity outcomes are assembled into the architecture of teachers’ professional identity through analytical narratives designed to make sense of the events that are part of their experience and help the teachers gain resolution and purpose from this adversity (Singer, 2004). Still inadequately understood, however, is the manner in which these archetypes manifest themselves through L2 teachers’ emotions and beliefs, instructional effectiveness, and commitment and persistence within challenging instructional settings. The final phase of this RQM study was designed to examine precisely these issues by sampling participants from within each cluster who were most typical of individual teacher immunity outcomes, and, again framing each language teacher as a complex system in which this outcome emerges, collecting extensive interview data from respective archetypes that would allow for a more comprehensive understanding of the construct of teacher immunity.

6.4 Validation Study III: Investigating the Signature Dynamics of Language Teacher Immunity

The data reported on in the previous two phases of the RQM validation study account for the principal archetypes of teacher immunity in which these language teachers came to settle. The purpose of this final phase is tied to the need to understand how particular teachers ended up in one state and not another, to identify the robust causal mechanisms for system development, and offer a parsimonious account of the processes that led a system to produce a particular outcome, the ultimate goals of RQM. In order to achieve this ambitious aim, three representative respondents—determined through proximity to the clustering centroids (i.e., the cluster mean) of each of the 6 validated clusters—were recruited from the previous cluster analysis stage of the RQM study. Each of these 18 exemplar teachers participated in three in-depth, semi-structured interviews. The objectives of these serial interviews were (a) to identify factors that have contributed to respondents' current language teacher immunity archetypes, (b) to determine how respective archetypes influence teacher identity and self-concept, and (c) to identify how archetypes manifest themselves in motivated behavior.

6.4.1 A developmental blueprint of language teacher immunity

To begin, let me outline how the dataset addresses the issue of immunity formation. In an earlier chapter in which I proposed complexity theory as the theoretical framework for this thesis, I have endeavored to show that the logic of complexity theory can be used as a rigorous aid to investigate phenomena in ways that prioritize adaptive and developmental processes. The developmental blueprint of L2

teacher immunity is informed by the notions of *self-organization* (i.e., the spontaneous process by which higher-level order emerges from the local interaction of disordered components) and *emergence* (i.e., the rise of salient, novel outcomes or configurations that are coherent at a macro level) from this complexity theory framework. To refer back to my exploratory case study, the initial findings show four main phases in the dynamic development pattern: *triggering*, *linking*, *realignment* and *stabilization*. The data from this final phase of the RQM validation study offer substantiating evidence for mapping these developmental trajectories.

Table 12 presents a summary of the main teacher archetypes broken down by the main phases of the development pattern of each archetype. As can be seen, each and every system clearly had an individual history that played a critical role in its dynamic trajectory of development. However, what is also immediately apparent is that at key stages teachers are faced with choices (e.g., to adopt a particular coping repertoire or to subscribe to a particular narrative) that have the potential to further propel them down the developmental pathway they are on, or to perhaps move them into a different trajectory altogether. In reporting this data, I proceed first through the developmental process to provide a coherent narrative of the signature dynamics that appeared to have produced the various language teacher immunity archetypes.

Table 12. Signature Dynamics of Language T5eacher Immunity Archetypes

	<i>The Spark Plug Archetype</i>	<i>The Visionary Archetype</i>	<i>The Fossilized Archetype</i>	<i>The Defeated Archetype</i>	<i>The Sell-out Archetype</i>	<i>The Over-compensator Archetype</i>
<i>Triggering Stage</i> (perturbation of initial conditions)	encounters high-intensity threats or disturbances that interrupt their stable functioning and send them into a state of instability and disillusionment					
<i>Linking Stage</i> (adaptive coping aspect)	cope through embracing conflict head-on and risk taking	cope by channeling frustration and anger into a grand search	cope through denial, avoidance, and rationalization	cope through withdrawal and self-handicapping	cope through dissociation and displacement	cope through self-blame and distortion
<i>Realignment Stage</i> (phase changes)	reconfigures around increased agency that builds self-efficacy	reconfigures around mechanisms of tenacity, self-actualization, and fulfillment	reconfigures around conservatism, illusions of self-efficacy, and aversion to change	reconfigures around powerlessness, resignedness, callousness, and cynicism	reconfigures around self-serving apathy, complacency, and a jaded indifference	reconfigures around guilt, an obsession with perfectionism, and an inferiority complex
<i>Stabilization Stage</i> (narrative aspect)	adopts a <i>generativity narrative</i>	adopts a <i>hero narrative</i>	adopts an <i>if-it-isn't broken-don't-fix-it narrative</i>	adopts a dual <i>inevitability-victimization narrative</i>	adopts a <i>sufficiency narrative</i>	adopts a <i>limitation narrative</i>
<i>Phenomenological Manifestation</i>	The Spark Plug has a passionate and contagious enthusiasm	The Visionary is a quixotic dreamer	The Fossilized Teacher has plateaued	The Defeated Teacher suffers from the teaching equivalent of learned-helplessness	The Sell-out is doing just the bare minimum to get by	The Over-compensator suffers from the impostor syndrome

6.4.1.1 *Triggering stage*

One of the key tenets of self-organization is that if the components of a system are to reconfigure and adapt themselves, a destabilizing event is needed to interrupt the stable functioning of that system and send it into a state of disequilibrium (Larsen–Freeman & Cameron, 2008a). It will come as no surprise, then, that one commonality in this dataset was the experience of destabilizing events in the *triggering stage* which provided the initial impetus for systems to self-organize along their respective trajectories to teacher immunity archetypes (see Table 12).

My principal was a bit of a control freak. (...) I mean, he sometimes even stormed in right in the middle of my class and shouted at me just to make a point. (*Susanna*, Visionary, I1)

Sometimes when I get student evaluations I feel betrayed and angry. (...) You know you've done something right from your moral sense or your worldview as a teacher, but how do I reconcile these conflicting responses from students? (*Karen*, Sell-out, I1)

Instances of adversity capable of triggering this process of formation are not isolated events in K-12 language teaching contexts; by all accounts, they are more often than not the norm (Moodie & Feryok, 2015). The types of events which triggered the formation of language teacher immunity were generally high-intensity threats that ranged from managing destructive student behavior and delinquency, or punitive evaluations and accountability measures designed determine a teacher's continued employment. The data indicate that these high-intensity threats were part of all 18 teachers' daily existence, and sent them into a state of instability and disillusionment.

I was placed in the department of student discipline and I was horrified by some of the conflicts I went through. (*Subin, Overcompensator, I1*)

Just imagine your homeroom class refusing to cooperate for a whole semester. (...) You will lose your desire to wake up every day. (...) Maybe you have to experience it to know what I'm talking about. (*Bella, Defeated, I3*)

In CT the upheavals which occur in this triggering stage are termed *perturbations*, and these events or stimuli have close parallels with the notion of *dissonance* (Kubanyiova, 2012). As with biological immunity, language teachers may not initially experience significant disruption when they come under attack from these disturbances. Positive feedback loops must amplify a perturbation to the desirable threshold to trigger the restructuring required for the self-organizing process (Larsen-Freeman, 1997). However, if left to accumulate these triggers would rapidly lead to exhaustion, cynicism, and burnout, and thus result in significant adaptive challenges for an individual.

When it got to the point that I can't ignore what's going on, that's when things were really scary. (...) I was going without sleep and working 16-hour days, because there was not enough time, and I was doing my best, but I was still to blame for my students' [exam] failure. (...) At this time I knew I'm in a downward spiral. (*Alex, Fossilized, I1*)

Encounters that shake things up within a system, seen in these examples, are essential for the components to adaptively reconfigure themselves, and in the absence of these perturbations very little qualitative change in a system's state can be expected. As highlighted earlier, however, this seeming turmoil resulted in positive prospects for

self-organization because it immediately unrestricted the possibilities for system development and raised the potential for productive emergent outcomes. The comment by Hyo below illustrates this.

You know, I hated the sight of those girls, and honestly I was pretty near to a nervous breakdown in that semester (...), but the final effect those students had on me was actually a benefit because I had to adapt to what happened, so I learned to move on. (*Hyo*, Spark Plug, I3)

Because each single L2 teacher immunity archetype shared the experience of destabilizing triggers, this aspect could be seen as a necessary—although not sufficient—cause in the self-organized process that culminates in the emergence of an archetype of L2 teacher immunity. One striking aspect apparent in this nascent stage of self-organized development was that it was still premature to distinguish between individual archetypes or trajectories for the L2 teachers. Of particular interest here is evidence which indicates that even the teachers who had developed halfway features of immunity (i.e., the Defeated archetype), and immunocompromised teachers who had not developed any coherent form of teacher immunity (i.e., the Overcompensator archetype) were well acquainted with these perturbations; they in fact featured as a substantial aspect of these archetypes' past and present professional experience. However, precisely because this was not singular to any one archetype, it was not possible to determine or predict the precise pathway a teacher would travel down.

6.4.1.2 *Linking stage*

Once destabilized, open systems begin to adaptively reconfigure themselves in increasingly complex and productive configurations (Banzhaf, 2009). They achieve this through *coupling*—the formation of linked relationships that mediate the interaction between system components. Thus, following the triggering impetus, language teachers employ coping strategies that link to specific disturbances (see Table 12). For instance, the teachers in the Spark Plug and Visionary archetypes deployed a repertoire of coping strategies that attempted to deal with the disturbances head-on through creative risk-taking and embracing conflict on the one hand, and channeling frustration and anger into a grand search for solutions on the other. This choice adjusted their developmental trajectory and propelled them into new, unexplored territory.

I can choose to get mad at the system, or I can try to get even and find a way to influence it from inside. (*Sam*, Visionary, I2)

You can never settle in a comfort zone. (...) So the secret to success is about embracing uncertainty. (*Vivian*, Spark Plug, I3)

There's a saying that 'to get through something you have to go deeper in to it' right? (...) There really isn't any choice but to take some risks. (*Hyo*, Spark Plug, I3)

How these teachers responded to instances of upheaval had a profound impact on each archetype's pathway of self-organized development (see Table 12). While in the above instances the methods for coping were adaptive and constructive, other archetypes relied on coping behaviors that could be characterized as skewed and

defensive. Importantly, however, the coping practices chosen by each archetype in this linking stage performed an identical function, namely to resynchronize the system's behavior and to screen out undesirable and disturbing stimuli from the environment in ways that allowed the teachers to focus on aspects of their practice that they prioritized. This was the case with the Fossilized archetype who, for example, defaulted to practices such as denial, avoidance, and rationalization:

You know, I think a much smarter way of looking at things is that 'I will teach you [students] when we are together in the classroom, but I'm not paid to parent you, or counsel, or solve all your problems.' (...) So, if that's what they want from me, you are going to be very disappointed. (...) And that's kind of how I approach my work, and I've never felt guilty about that. (*Grace*, Fossilized, I2)

It was equally the case for the Sell-out archetype who adopted regulatory behaviors characterized by dissociation and displacement:

To be very honest, instead of sacrificing everything for the sake of my students, I really just tend to give up when I know those things are not my fault and they are beyond my control. (*Simon*, Sell-out, I2)

Yes I'm introspective, but I'm also fairly phlegmatic. I'll just let it go. (*Min*, Sell-out, I3)

As well as for the Defeated archetype who reported coping through withdrawal and self-handicapping—illustrated by Hongjin here talking about how he has dealt with measures of contractual accountability:

How can I even try to think about creativity, or extensive reading, or authentic materials? I'm not going to try any new kinds of tasks and activities because what I want to do is just going to be lost in this process. And then it will be back to the same old thing. (...) So, I wonder if students realize that my classes are basically designed to keep them happy. I mean, all I need to do is keep my students quiet and that will keep my vice-principal satisfied. (*Hongjin, Defeated, I3*)

Overall, the aim of all these coupled interactions was to mitigate any harmful effects, and thus they contributed functional and causal coherence to the self-organization of these systems. Because these interactions adjusted each system's self-organized trajectory and restricted the developmental degrees of freedom (i.e., the possibilities for variation in development), they might be seen as the initial functional motors of change. Gradually, each archetype developed a coping repertoire which allowed system components to exchange energy and learn new things in order to synchronize the behavior of the system. The one exception to this was, not surprisingly, the immunocompromised Overcompensator archetype, whose reliance on self-blame and distortion in response to upheaval only served to amplify the destabilizing effects and exacerbate the state of disequilibrium.

Maybe it's just me, but I feel that sometimes it makes things worse when I try new things. Maybe I should just teach the way they [students] expect me to teach, and then I'll have fewer problems. I don't know. (*Jihoon, Overcompensator, I2*)

Thus, as a result of the linking stage, the individual elements—here the disturbances and strategic coping responses—can no longer operate independently of each other,

and the established constructive ties began to nudge the system back in the direction of equilibrium (Holland, 1995).

6.4.1.3 Realignment stage

In the realignment stage, the symbiotic relationship developed between the disturbances and explicit response options allows the language teachers in respective archetypes to return to stability, and relative productivity, despite the uncertainty and adversity they continue to experience. Through the cumulative impact, the dynamics of the system pass a certain threshold—what might be termed a point of no return—restoring a measure of synchronization and leading to a new-found coherence in the system (see Table 12).

I've always been a perfectionist, but now I realize (...) the key to changing my students' life is theirs not mine, so when I learned this I became much more fulfilled and happy. (*Carrie*, Visionary, I2)

For those developing down the path of productive teacher immunity, as in the case of Carrie, this may mean reconfiguring around mechanisms of tenacity, self-actualization, and fulfillment; for others on a trajectory toward a maladaptive teacher immunity outcome, such as Simon, this may mean reconfiguring around self-serving apathy, complacency, and a jaded indifference.

You asked me to talk about something I've done that's defined me as a teacher. (...) Well part of who I am is that I don't think too much about what students want. Plus, my experience tells me that most students don't even know what

they want or need. They might say one thing, but it's all just...they don't know better. (*Simon, Sell-out, I1*)

In complexity theory this transition to a qualitatively distinct outcome is termed a major *phase change* (Goldstein, 2011). A phase change is typified by a system, in this case an archetype, reconfiguring around a novel outcome—what I have referred to in my earlier review as a new attractor state. The notion of path dependence also illustrates that the established relationship between the linked perturbations and regulatory strategies constrains, to some extent, the way in which each archetype begins to reconfigure (see Table 12). For instance, as Carrie's data excerpt above illustrates, the Visionary archetype reconfigured around a newfound tenacity, self-actualization, and fulfillment.

The data extracts below further illustrate that the Spark Plug archetype reconfigured around increased agency that contributed a concentrated measure of self-efficacy:

I was able to see that I did hold the power; that I could change things that weren't working, and if not, well then at least I wasn't going to waste my life stuck on that small issue. (...) So, then I made up my mind that I am constantly going forward, even if it means I have to go alone. (*Vivian, Spark Plug, I3*)

Sometimes I look at myself and ask myself what kind of teacher I am or what my teacher philosophy is. Not all teachers have that, but I guess it's the equivalent of faith or belief regarding teaching, and it helps me to hold myself together. (*Yong, Spark Plug, I2*)

On the other hand, the Fossilized archetype reconfigured around conservatism, aversion to change, and accompanying illusions of self-efficacy:

Well, why should my students doubt about my approach? I think it's just a bad attitude or maybe they need to learn more about respect. (...) I've been doing this a lot longer than they think and even my principal doesn't ask me what I do in my classroom, so how can my students? (*Alex, Fossilized, I1*)

The phase change that these systems undergo in the realignment stage allows each respective archetype to recapture a sense of equilibrium by getting a handle on the teaching-specific upheavals to which they were previously vulnerable in their own way (see Table 12). This was also the case for the partially-immunized Defeated archetype which reconfigured around powerlessness, resignedness, callousness, and cynicism as these particular teachers used this phase change to achieve survival in the manner they had prioritized:

What I think the students really want is just to sit there, and I do all the work. So, now I guess I can sort of accept the divide between how I want to teach and how I have to teach to survive. (...) I know what you may be thinking, but (...) I'm tired of people telling me how to run my classroom when they don't know my students, you see? (*Bella, Defeated, I2*)

However, the one exception to this was the immunocompromised Overcompensator archetype whose reconfiguration around guilt, an obsession with perfectionism, and an inferiority complex represented less of a phase change to a qualitatively novel outcome and more of an entrenchment within the dominant pattern of its unimmunized attractor state.

I still like teaching, but I am not that kind of “good” teacher. But even though I’m sure I’m not a highly-qualified teacher (...) if I ask students to always work hard and do their best for their study then they might accept me, because that’s the kind of image I show to them. (...) But anyhow, I feel sorry for my students sometimes because of my limitation. (*Mike, Overcompensator, I2*)

For the remaining five teacher immunity archetypes, the cumulative impact of coping mechanisms gradually resulted in novel configurations of synchronization emerging for each. The dramatic shift evident in this realignment stage, as the data above suggest, can be seen as a phase change—equivalent to a system crossing a threshold in its development (see Table 12). Different archetypes equilibrated toward various attractor states, and the unique characteristics of each of these reconfigurations were substantial. The current developmental process is not cyclical; rather, the emergent stability is assembled *in vivo* and is prone to adjustment as a response to contextual interests and demands. It is at this stage that the emergent stability can be seen as a function of the accumulated experiences of weathering and responding to adversity, revealing the beginnings of resilience in language teachers’ recovery from demonstrable risk. This resulted in novel and qualitatively distinct outcome patterns that allowed the teachers to recapture a sense of integrity and stability, and the shared consequence was once again to further restrict the developmental possibilities for each archetype and propel the systems further down a path-dependent trajectory of development.

6.4.1.4 Stabilization stage

The final stage of the process—what I have here termed stabilization—involves L2 teachers solidifying the emergent outcome as a component of their professional identity through the formation of powerful episodic narratives. These analytical narratives are chosen to frame and internalize experiences, and through this analytical narrative formation, the developmental process stabilizes into a robust attractor state (see Table 12). The narratives adopted by teachers in this stabilization phase should be seen as storied constructions that attempt to render the past, present, and future in a coherent way, rather than purely veridical accounts of actions or events (McAdams, 2001, 2008).

Every day, I promise myself (...) to grab onto the serendipity of life (...) and try to contribute something to the world. I don't mean I'm looking to be big and famous, but for me recognition comes when I know that I am making a place for others to feel alive. (*Sam*, Visionary, I3)

Even the experts said there's no right way of teaching, (...) and so far my classes [results] have not been lower than the other teachers in my school, and I think that leads me to keep the way I am doing now. So, unless I have a huge failure or see a big problem I'm going to do as I do now. (*Sooyun*, Fossilized, I3)

Whether language teachers evolve a positive or a counterproductive immunity is contingent on the initial stages (i.e., through the choice of maladaptive rather than transformative coping strategies), and on the configuration the system realigns itself around (i.e., the phase it transitions to within the state space). However, because it must be narrated into the language teacher's identity, ultimately the narrative

dimension of the stabilization stage determines the precise solution into which it settles (see Table 12). It is this settling within a critical outcome of teacher immunity which permits observations about the archetypes proper (e.g., how they manifest phenomenologically).

Multiple narrative dimensions exist: The excerpts below illustrate, respectively, a *generativity narrative* of the type adopted by language teachers in the Spark Plug immunity outcome, and a *sufficiency narrative* typical of those in the Sell-out teacher immunity archetype.

I never want my energy to be wasted. If I spend all my energy just on myself as a teacher that is exactly the kind of thing I'm talking about, a waste. But, you know, the funny thing is that I'm mainly there for my students, but they're there for me too. (...) I was young once, and they give me back some of that feeling in my life. (*Hyo*, Spark Plug, I2)

I am resentful of it when others see me as a servant to society when I basically feel that teaching is just the way I support myself. (...) Why does it have to be more than that? (*Min*, Sell-out, I3)

Adopting contrasting narratives distinguishes different archetypes, and each of these narratives provides the final layer that functions as the interface between the underlying developmental process of the teacher immunity outcome, outlined above, and the phenomenological reality of things. Throughout, each self-organized trajectory was gradually steered to a limited range of salient outcomes, but it was ultimately the narrative dimension of the stabilization stage that determined the precise solution into which systems settled (see Table 12).

While specific episodic narratives are directed toward particular instances of vulnerability a language teacher has encountered, these individuals also manage to pull these together into an umbrella narrative for their whole professional teaching persona (Connelly & Clandinin, 1999). The example below of an individual who had stabilized into a Defeated archetype shows that an L2 teacher may account for their performance through an episodic narrative of how they were a participant in what was ultimately a biased system of evaluation:

So many irrelevant things affect my evaluation scores. If the weather outside is bad, that affects your evaluations. If you didn't dress well or smile enough, that affects it too. (...) But what's even more stupid is that there's no benefit for getting good evaluations at all. (*Allie*, Defeated, I2)

And, extend this to a broader umbrella narrative of victimhood in response to higher performance demands:

I can say that I don't think much is going to change in my classroom. I'll keep teaching but I don't know if I will see much that is different. (...) Those evaluations annoy me, but the worst they can mean is you lose your teaching position. (...) So, if it gets hard, then I might change. And, if the system changes then my life might be worse, but I can't predict right now. (*Allie*, Defeated, I3)

Alternatively, they may construct an episodic narrative of how on comparison they can never live up to their own classroom expectations and intentions as practitioners, as in the following example of an individual who had stabilized into an Overcompensator archetype:

In my young days I had some teachers who encouraged me and had a great effect on me. So, they were the best teachers who inspired my life. (...) But, every time I reflect on my teaching effect, I realize I don't have much in common with them. (Mike, Overcompensator, I1)

This might then be expanded through an umbrella narrative regarding the inherent limitations one has as an educator:

Maybe I'm wrong, but I am a teacher who only knows how to work hard. Then, can I be called a teacher? (...) I really like my students, but my language ability is not high, and I have no special skill as a teacher. (Mike, Overcompensator, I2)

What is clear from the developmental blueprint is that at each step of the teacher immunity formation process, these teachers are presented with a set of limited potential options that can change the way things end up, for instance adopting a particular coping repertoire will have consequences that would not have resulted given the choice of alternative strategies. Nevertheless, it is by constructing and internalizing narratives which frame the individuals' experiences in a unified and purposeful thematic arc that these teachers ultimately came to reside in their respective archetypes of language teacher immunity (see Table 12). Emergent phenomena cannot be scripted or engineered into existence, but instead are premised on a system synchronizing itself absent a central controller. Thus, an emergent process like language teacher immunity, in a sense, demands a complexity perspective to account for and model the development of its self-organized, emergent outcome and pattern.

6.4.2 Phenomenological manifestations of language teacher immunity

Along with investigating individual trajectories or pathways of development for particular teacher immunity outcomes, this phase of validation was also designed to examine how the various outcomes of language teacher immunity are displayed in teachers' emotions and beliefs, instructional effectiveness, and commitment and persistence within challenging instructional settings. Can language teacher immunity be said to impact these teachers' sense of professional identity and their motivated behavior? It is to these themes I now turn.

6.4.2.1 Identity

A prominent theme which emerged from the data analysis was the central role of a language teacher's immunity archetype in their professional self-concept, which on another level was operationalized into concrete classroom behaviors and mindsets. When asked to describe their key teaching behaviors and recount significant classroom events, teachers seldom provided statements of what they do, but focused instead on communicating who they are. That is, they focused more on explanations of identity that were consistent with the characteristics of respective immunity archetypes rather than focusing on classroom practice and descriptions of technique. Two divergent and conflicting discourses emerged. The first was the notion of an authentic, wholly congruent identity of being a teacher at the nucleus of oneself:

Teaching isn't just what I do. It is who I am. (...) If you took it away, I wouldn't be me anymore. (*Yong, Spark Plug, I2*)

While the other appeared to be a fragmented identity with elements of pretense or façade that was misaligned with teachers' inner allegiances:

Interviewer: Can you think of a time when you did something that helped to define you as a teacher, and maybe tell me about it?

Respondent: (...) Have you ever felt that everything you do during your life is a lie? (...) I have felt that, but that's probably not what you want to hear (*laughs*). (*Karen, Sell-out, I1*)

Teachers in productively immunized configurations filtered their daily practice through a lens of fidelity to self. On the other hand, teachers who were maladaptively immunized, even those only partly so, struggled to make sense or construct meaning through the unmistakable filter of incongruence that ranged from the relatively benign to a painful mismatch.

It's true about us teachers. (...) Sometimes I feel that I have the worst job in the world. (*Allie, Defeated, I3*)

These data illustrate a broader pattern of complex causality, namely that the ways in which these teachers engaged in sense-making shaped the trajectory through which they developed, but then also became contingent on the outcome pattern of teacher immunity into which they had settled.

Characterizing teacher identity as experiential, as outlined in my earlier review of the literature, means embracing the notion that lived experience has facilitated the unique perceptions of self that teaching professionals have acquired in their role (Beijaard, Verloop, & Vermunt, 2000; Keltchtermans, 2009). Extended to teacher immunity, this means that the accrued experiences central to the teacher immunity

formation process are included in those significant events teachers' viewed as making them who they are. In other words, teachers' experiences simultaneously fuel both their identity work and the developmental process of immunity formation. For those who occupied a robust, productive teacher immunity outcome this was more straightforward: challenged to identify solutions in their daily practice, they drew on their outcome of teacher immunity to guide their sense of self and life as a teacher.

Interviewer: What did you mean that you 'know who you are now'?

Respondent: Well, I am confident in who I am. (...) I think have been through everything that I can experience, for several years. (...) There is nothing new that can change me or make me doubt who I am. And, I am not really going to change myself now just because of a couple terrible classes, or mean co-workers who make my life difficult. This is why I am stronger than that.

(*Susanna, Visionary, I2*)

By comparison, however, the dissimilar concerns which took prominence in the experience of those in other teacher immunity configurations helped to shape the identity discourse that emerged from their interviews and demonstrated that immunity archetypes may be a critical, although subconscious, part of these teachers' professional identities:

Interviewer: Can you tell me, what does it mean to you to be a teacher?

Respondent: (...) Being a teacher should be a great job, but in fact it's a very confusing job. (...) You think you have a lot of freedom to change the world and change your students, but actually you don't have much (*laughs*). You spend most of your time to protect yourself from others: from your students and parents, and even other teachers. (...) These are the things that mean being a teacher to me. (*Alex, Fossilized, I2*)

Seen in light of the data above, teacher immunity could be said to occupy an important space in a teacher's professional identity for two reasons. Teacher immunity is narrated into being—in the stabilization stage of immunity development—as a process of consciously recognizing and legitimizing personally meaningful events and actions. And, because the activities and events teachers participate in will play a role in the formation of their professional identities, it also draws on and shapes the very experiences that form the basis for these narratives.

6.4.2.2 *Mindsets*

Mindsets were one phenomenological manifestation of respective teacher immunity archetypes and the data indicate that they go almost hand in hand with the other prominent manifestation of it, i.e., teachers' classroom practice. A mindset that sees uncertainty and spontaneous change as an obstruction to one's practice and professional well-being that must be preemptively shut down was present in the maladaptive outcomes of teacher immunity, the halfway type, and the immunocompromised archetype.

I can't help wondering what I'm actually doing in the classroom or if I really have anything to offer as a teacher, you know. (*Jihoon*, Overcompensator, I2)

The reason I stick to my routine is because I know it worked before, and I don't want to lose my dignity. (*Sooyun*, Fossilized, I3)

The four teacher archetypes that adopted this mindset relied on self-regulatory efforts to reassert control over incongruence threats to their self-concept. Because this

attitude appears to preclude meaningful and critical self-reflection, it was impossible for these teachers to embrace the restructuring of their self-concept.

If I can just work a little harder or longer, I can develop professional stability. (...) But, I have to suffer now to become a respected teacher later. (*Subin*, Overcompensator, I3)

What I mean is, I don't think I can never be wrong, but what I do every day in the classroom has to be my choice. I can't just do my job based on someone else's thoughts. (...) That would be constant chaos. (*Simon*, Sell-out, I2)

It appears that when a teachers' professional existence is a constructed pretense, they may also have a mindset of fear that further exacerbates matters. This mindset itself, ironically, became the key factor that manifested as risk-avoidance, inertia in practice, resignedness, and cynicism. The following excerpt from one interview illustrates this well.

I have tried, you know. As a teacher I've tried everything I can think of. (...) I just think there is some theory or practice that works for some people, but it doesn't work for me. (*Bella*, Defeated, I3)

Put another way, it may be possible to conclude that it was not so much the teacher immunity archetype that directly manifested in L2 practitioners' choices of action, but rather the accompanying mindsets and beliefs that implicitly guided teachers' responses to the contextual demands of their teaching.

Teachers who were productively immunized took the alternative mindset of acceptance and tolerance toward the inherent conflict they felt in their classroom

practice and their sense of personal growth. On balance, it was not that these teachers' experiences were more wholesome and less trying. Rather, this idea of expanding connections and a constant dynamic self-reformation affected how they positioned themselves in the profession as well as their range of responses within the classroom context.

In my life as a teacher I am on a journey of self-discovery. There are some places I might get to, but maybe I won't ever arrive there. (...) That's not important right now. All I focus on is traveling on the journey every day.
(*Susanna*, Visionary, I3)

As mentioned, this mindset was apparent in the classroom behavior of these teacher immunity archetypes in response to particular instances of vulnerability:

We are all in this together. If they [students] have a problem, then so do I. (...) And every little thing you do will have an effect even in 20 years. (*Yong*, Spark Plug, I3)

And it was equally robust in the face of recurrent threats to the language teacher's well-being and classroom effectiveness:

I rarely tell others about this, but...you don't know how many times I've thought of just walking away. But, if I do that I am basically admitting defeat. And I won't do that because (...) failure is not for me. (*Carrie*, Visionary, I2)

It is clear that teachers may not be able to choose the conditions of their context, but these findings indicate that they are able to attend to actively constructing narratives of self-hood. Because there are clear distinctions between the mindsets of teachers at

all points of the teacher immunity spectrum, their respective immunity archetypes provide an essential dimension for examining how their teacher identity and teacher mindsets are activated in situated classroom behavior.

6.4.2.3 Classroom practice

When viewed with relation to these teachers' classroom practice, what emerges from the data is a clear divide between the productive teacher immunity outcomes and those that are maladaptive. Only the productive strains of language teacher immunity appear to provide language teachers with the means to recognize, differentiate, and gear an appropriate response to specific episodic disturbances or instances of vulnerability that they encounter in the language classroom. In the following example, Vivian recounts how, through the repertoire of coping strategies she developed as part of her archetype, she was able to de-escalate the threat of a lawsuit from a parent incensed at their child's poor achievement on a high-stakes exam.

(...) This parent was going around gathering evidence that we had the wrong exam answers, and she was even getting ready to take it to a lawyer and sue the school and everything. (...) So I went on the offensive and invited her into my classroom, and told her it might help her collect evidence about the exam. I even told her 'I'm on your side here.' (...) So she came to observe and participate for one day (...) and after that she never made a fuss again. (*Vivian, Spark Plug, II*)

Thus, as with adaptive immunity from the biological domain, productive language teacher immunity can be seen as providing L2 practitioners with the specificity in

their responses that allow them to recognize particular disturbances, distinguish them from other events, and respond appropriately to continue functioning constructively in their practice.

Taking this one step further, the productive outcomes of language teacher immunity capitalize on teachers' overcoming upheaval and challenges in the past to inform their future responses to subsequent disturbances. This eventually becomes anticipatory and is used intelligently to regulate the teacher's equilibrium over time. Here, for instance, Hyo relates her use of journaling with her most aggressive students to help them acknowledge and resolve these recurrent incidents in the L2 classroom.

I started to use journaling for my students' stress management, when they are feeling violent and aggressive toward someone. The first thing they need to do is clarify their thoughts and feelings, and then they can confront the person publicly with that. Then the person owes them a response on the next school day. (...) So, instead of students organizing their violence in private like before, now they bring up their problems in front of their peers for a fair solution. (*Hyo, Spark Plug, I3*)

To extend the parallels with human adaptive immunity, language teacher immunity could be said to involve some form of immunologic memory because it allows teachers to draw on previous experiences of upheaval to formulate responses that over time become more rapid and powerful.

Productive varieties of teacher immunity contain a robust resilience that evolves and adjusts constructively in response to changes in order to ensure that the language teacher can bounce back from adversity and can function optimally despite continuing 'attacks' on the system. The following data excerpt illustrates. In this

interview extract Sam expresses the ability to function positively and successfully in the classroom despite being notified that he would be let go by the school at the end of the semester due to decreasing enrolments.

It was a tiny school, with a bad vice-principal. (...) Ok, so it was out of my control, and it was probably going to happen anyway. But, that was one of the best semesters I had in my career. (...) I can't really explain why. (...) I knew what was coming, but it somehow didn't affect me at all. (*Sam, Visionary, I3*)

Thus, just as with acquired immunity in the physical sphere, language teacher immunity appears to gradually develop into a robust and long-term protection against subsequent exposures to the classroom disturbances L2 teachers count as part of their experience.

Finally, to link back to the previous themes of identity and mindsets, because the productive teacher immunity outcomes solidified into an authentic and congruent identity which in turn promoted a mindset of tolerance toward the inherent conflict that arose from their L2 classroom practice, these varieties of teacher immunity appear to sustain a protective capacity against stressors, failures, and threats to the language teacher's well-being and classroom effectiveness. In an excerpt of her account about yearly curriculum changes and the shifting objectives of educational reforms, Carrie explains how she is able to remain consistently effective at addressing student needs in class despite this.

I never know exactly what grade I'll be teaching next year until the vacation starts, and the Ministry of Education is always "updating" (*uses air-quotes*) things. Plus, the textbooks need to be changed every year, and our tests are

developing constantly. (...) But, that doesn't change my responsibility (...) I still feel my job is to be prepared, and active, and organized, and as fair as I can for my students. (*Carrie, Visionary, I2*)

For better or worse, teacher immunity outcomes manifest themselves through the motivated behavior of these language teachers, and are displayed in the real-time classroom choices these practitioners made. Thus, the data suggest that these teachers' emotions, their teaching motivation, and ultimately their instructional effectiveness may hinge on the respective outcome of language teacher immunity they have developed.

6.4.3 Discussion & summary

This study set out to fingerprint the dynamic development of language teacher immunity by identifying the robust causal mechanisms for system development, what I have termed the system dynamics, and account for the individual processes that led each system to produce a particular self-organized outcome. What are these signature dynamics? The data suggests that they can be construed as a retrospective road map of the unique self-organized trajectory followed by each system. That is, if the system at each stage of its self-organized development were to take a particular step or move into a particular direction in the state space of possibilities, a particular outcome of teacher immunity would necessarily emerge. A secondary purpose of this study was to examine how the various outcomes of language teacher immunity are displayed in teachers' mindsets, instructional choices, and their emotion and motivation within challenging instructional settings.

First, with regard to the factors that have contributed to the development of these 18 respondents' current language teacher immunity archetypes, the data showed evidence of distinct signature dynamics for each system. This study confirmed that it was indeed an accumulated experience of significant disturbances that initiated these L2 teachers down their individual pathways. Perturbations triggered a form of disequilibrium that was necessary for each individual to restructure and reconfigure the system by linking to a repertoire of coping strategies that permitted the teachers to respond and deal with these instances of crisis. What emerged from the data, too, was the importance of path-dependence because iterations between continuing perturbations and the choice of response options may have entrenched systems in to a particular path of development (i.e., one that was more productive or more maladaptive) with each repetition. This linking resynchronized the system's behavior by screening out undesirable and disturbing stimuli from the environment and led to realignment in the system—a synchronization that resulted in major phase change and novel outcomes of equilibrium. These emergent language teacher immunity outcomes were then solidified when the teachers internalized them as a component of their professional identity through the formation of powerful analytic narratives.

Secondly, with respect to how the teacher immunity archetypes influenced teacher identity and self-concept, the individual language teacher immunity outcomes were central to each practitioners' professional self-concept. On the one hand, productive outcomes of teacher immunity allowed teachers to internalize a narrative of identity congruence (i.e., that of being a teacher at the nucleus of oneself), whereas the remaining maladaptive, halfway, or immunocompromised outcomes left teachers internalizing a fragmented identity that was misaligned and incongruent with who

these teachers say themselves as. Not only this, the accrued experiences that the self-organized development of teacher immunity is contingent on was also found to simultaneously fuel the construction of their professional identity: the activities and events that were part of these teachers experience shaped the narratives that solidified the teacher immunity outcome in their professional identity. This suggests that language teacher immunity is a critical part of these teachers' professional identities.

Finally, and perhaps not surprisingly, language teacher immunity manifested itself distinctly in teachers' motivated behavior. Although no purely objective measure of these L2 teachers' practices was part of this data set, the interview data highlighted a clear distinction between the reported classroom practices and affective demeanor of those who were productively immunized and those who occupied a maladaptive, halfway, or immunocompromised archetype. The data indicate that it was exclusively the productive outcomes of language teacher immunity that provided specificity, memory, adaptability, and durability in their responses to critical events in the classroom, and I have reported excerpts of these above. On the other hand, while the more maladaptive archetypes of language teacher immunity closely mirror the productive outcomes with regard to their global protective function that ensures system survival, these also generate abnormal defense mechanisms to threats. This was evidenced in the non-productively immunized language teachers' extreme risk-avoidance and aversion to change (i.e., the Fossilized archetype); their general apathy, complacency, and jaded indifference (i.e., the Sell-out archetype); and their resignedness, callousness, and cynicism (i.e., the Defeated archetype).

6.5 Conclusion

This chapter has reported on four separate but sequential studies that each build on the previous designs and provide an expanding picture of a novel construct, language teacher immunity. The first of these was an exploratory case-study of four L2 practitioners that shed light on this self-organized outcome and suggested that language teacher immunity has a profound influence on teachers' psychological well-being and resistance to the structural challenges of teaching, as well as their engagement and persistence in the profession. The following three studies were a combined attempt to validate this construct using a retrodictive qualitative modeling research design. In combination, these three studies set out to fingerprint the complex, dynamic development of language teacher immunity and to arrive at robust propositions regarding (a) the prototypical outcomes of teacher immunity, (b) the developmental trajectories of the archetypes, and (c) the unique signature dynamics of each of these. The cumulative data from these focus groups, questionnaire surveys, and serial in-depth interviews indicated a core of six language teacher immunity archetypes that develop through a self-organized sequence of four stages. Language teacher immunity, for all six archetypes, was intricately wound up within the construction of a professional identity and played an influential role in their classroom personas and behaviors. These findings are consistent with work in the area of language teacher motivation which suggests that classroom practices are "rooted in the educational philosophy of deeper values and purposes" (Dörnyei & Kubanyiova, 2014, p. 171) that serve as the foundation for teachers' sense of self. Over the course of these four studies, whenever the opportunity arose to talk to teachers from a range of backgrounds and contexts, they were immediately familiar with the concept. These

teachers were not only familiar with the idea of teacher immunity, but they were surprisingly quick and happy to nominate people to whom this applied—very rarely to themselves. Clearly, researching this topic was akin to banging on open doors. In the chapter that follows I examine the implications of these findings, particularly with regard to the body of work in language teacher psychology and its utility for the field of second language teacher education.

7. General Discussion & Implications

7.1 Major Research Findings

In this chapter I begin by taking up the individual research questions formulated earlier to guide the research that comprises this thesis, and then summarize the answers provided by the results and data presented. I also outline several limitations of each study as I discuss the findings. I then turn to a thematic discussion that centers around the original contributions of this thesis to the research literature: what does it mean to be an immunized language teacher? How does language teacher immunity bridge the key concerns and concepts in language teacher psychology? What are the implications of language teacher immunity for the field of second language teacher education? This section will also link back to relevant areas from my review of the literature to better situate the discussion of these findings within a broader theoretical discourse.

7.1.1 The exploratory study

I began research in this area by designing a data-driven case study to explore the psychological qualities that set apart L2 teachers who thrive from L2 teachers who struggle to survive. Qualitative interview data were collected to examine whether teachers who are engaged and motivated, well-adjusted and productive might provide insight into the secrets to surviving as a teacher. The data suggested that these teachers had indeed developed an emergent outcome, which appeared to function as a defense mechanism against the material and emotional demands placed on L2 practitioners, and the accrued disturbances they encountered in their classroom

experience. I termed this outcome *language teacher immunity*. Taking the language teachers as the complex system in which self-organized change occurs, the data further pointed to a developmental blueprint through which this language teacher immunity emerges. This was a sequence of four phases—triggering, linking, realignment, and stabilization—which captured the emerging pattern in these teachers' individual experiences and their pathways of growth.

The data revealed that language teacher immunity allows L2 teachers to survive within the profession by safeguarding them against emotional upheavals, motivational setbacks, and threats to the self. This suggests that those who do not develop this teacher immunity are likely to remain vulnerable, and, therefore, developing a robust resistance appears to be a prerequisite to becoming a productive and competent language teacher. Although all of the participants were cases of this productive teacher immunity, they all also reported having witnessed or worked with colleagues who manifested something which appeared to be its maladaptive doppelganger in some form or another. This suggests that language teacher immunity can manifest itself equally in a counterproductive form. Thus, one implication of this study was that, along with the productive variety, there were other outcomes that exist: an unimmunized outcome that is likely to result in low L2 teacher morale, motivation, and self-efficacy leading to potential burnout and exhaustion; and a thick callous of counterproductive autoimmunity might be witnessed in teachers who are thick-skinned, resigned, cynical, uncaring.

Methodologically, this study drew on a particularly modest dataset—four language teacher participants were each interviewed three times (see Table 1)—and used a combination of GT and QCA methods. These both rely on progressive data

collection and case-wise analysis for analytical induction about a phenomenon, which makes them particularly appropriate for exploratory data-based studies (Bryant & Charmaz, 2007). The casing of these four participants was intentionally restricted to those who satisfied certain typical criteria, but purposively sampling these typical participants prior to data collection seems to be at odds with the preferred maximum-variation, theoretical sampling for saturation favored in case-based methods (Corbin & Strauss, 2015). The quality of the data collected in many exploratory studies is also partly a function of selecting an appropriate sample with firsthand experience of the phenomena being examined. One key result of sampling only L2 teachers who appeared to be thriving was that the data set was composed of extensive data about that outcome alone, and could not provide a complete picture of language teacher immunity from alternative perspectives, i.e., those of teachers with potentially different forms of this emergent outcome. Thus, it became imperative to investigate language teacher immunity using a more systematic research design that would shed light on its various global outcomes, the formation patterns of each of these, and its manifestations in L2 practitioners.

7.1.2 Validation study phase I

Using complexity theory as the conceptual framework for investigating language teacher immunity meant that a critical part of this research would be to identify the prototypical outcomes (i.e., attractor states) of this emergent phenomenon, and the complex makeup of these specific teacher prototypes. To do so, I adopted a retrodictive qualitative modeling research template. This first phase of the RQM sequence used focus-group interview data from L2 teachers and L2 teacher educators

(see Table 2) to investigate the most salient prototypes of language teacher immunity within the global categories (i.e., productive, counterproductive, and non-immunized) and the salient characteristics (i.e., system components) of each language teacher immunity prototype. The data showed that there were in fact more global categories possible: (a) productively immunized teachers (i.e., those with a robust yet healthy form of teacher immunity); (b) partially immunized teachers (i.e., those who had developed particular elements of the flexible and beneficial form of teacher immunity); (c) maladaptively immunized teachers (i.e., those with a rigid and counterproductive form of teacher immunity); (d) partially maladaptively immunized teachers (i.e., those who had developed partial aspects of the detrimental maladaptive form of teacher immunity); and (e) immunocompromised teachers (i.e., those who have not developed a teacher immunity). Within these were an initial set of nine, as yet unverified, prototypes.

Regarding the core characteristics of these language teacher immunity prototypes, seven components were found to be essential to the make-up of all the outcomes: *teaching self-efficacy* (i.e., teachers' personal beliefs about their effectiveness to competently perform their jobs); *attitudes to teaching* (i.e., teachers' sense of purpose, and commitment to the profession); *coping* (i.e., teachers' strategic action to remedy a situation or eliminate stress); *classroom affectivity* (i.e., teachers' positive emotional energy in the classroom); *burnout* (i.e., the psychological erosion that results from cumulative chronic stress); *resilience* (i.e., teachers' capacity to bounce back from trauma and maintain productive functioning despite risks and threats); and, *openness to change* (i.e., teachers' receptivity towards change and novelty in their practice). Particular combinations of these at varying levels were

exhibited as specific profiles of language teacher immunity. Because the data indicated they were a central part of any teacher immunity outcome, these seven constructs were, thus, used to inform the construction of data collection instruments in the subsequent research steps.

The focus-group interviews were conducted with language teachers from various settings as well as language teacher educators and program administrators; they, therefore, produced an extensive corpus of data about the prototypical language teacher immunity outcomes and the characteristics of each. However, due to the variety of prompts and focus-group techniques used, there were significant overlaps and redundancies from individual focus-groups and many more initial profiles than expected. As a result, these were reduced through combination and elimination during data analysis to settle on a narrower list of teacher prototypes that fit unambiguously into one global category. Additionally, the 13 theoretical constructs used to code the focus-group data were not all an unequivocal part of each prototype, thus a reduced list of seven constructs was settled on. For instance, imagery and vision were prominent characteristics of some teacher immunity prototypes but entirely non-existent in others, and these constructs were not retained in the research design of the next study. While this indicates is that there may be more components that make up the teacher immunity outcomes—a potentially long list of them, every effort was made to include the major factors that were empirically salient across all the teacher immunity outcomes.

7.1.3 Validation study phase II

Following the focus-groups, questionnaire data was collected from a sample of 293 language teachers and cluster analyzed. The aim of this phase of the RQM research design was to examine whether the language teacher immunity prototypes identified in the focus-groups would correspond with actual teacher immunity archetypes in a sample of L2 teachers. The two-step cluster analysis—when matched and triangulated with the focus-group data—validated and confirmed a more limited range of six robust, core language teacher immunity archetypes in this sample of L2 practitioners (see Table 6). These were distributed across the productive immunity outcome (i.e., the *Visionary* and *Spark Plug* archetypes), the maladaptive immunity outcome (i.e., the *Fossilized* and *Sell-out* archetypes), the halfway immunity outcome (i.e., the *Defeated* archetype), and the immunocompromised outcome (i.e., the *Overcompensator* archetype) (see Figure 6). The strong match between the initial focus group data and the cluster analysis data suggests that these six archetypes of teacher immunity (see Figure 7) are likely to be highly salient in many language teaching contexts and their characteristics almost instantly recognizable.

Two additional compelling findings from this data set were the significance of openness to change in determining cluster membership, and the elevated levels of burnout experienced by these teachers. With regards to the first of these, the variable openness to change accounted for 82% of variance in cluster membership (see Table 7), which indicates that, perhaps more than other descriptors, it is a critical measure of how productive the archetype of teacher immunity is that a given teacher has settled into. This reflects the nature of the language teaching profession—which often entails work that embraces innovation, creativity, and experimentation. The second of these

findings was that the symptoms of burnout ranged from moderately high to very high for teachers in every cluster (see Table 8). The two productively immunized teacher immunity outcomes, in fact, reported the highest levels of burnout overall. However, when viewed in combination with other factors such as resilience, coping skills, and teacher self-efficacy, the high level of burnout may be an indicator of the variance in teacher immunity archetypes' ability to function productively. That is, their high levels of burnout notwithstanding, productively immunized language teachers would be expected to remain resilient, able to cope with setbacks, and efficacious (see Figure 6).

While the cluster analysis of this dataset was fairly straightforward and identified major clusters in a systematic way, it also left several questions unanswered. First, although the cluster solution was validated through both a multivariate analysis of variance and a multinomial logistic regression, there is no objectively foolproof way to extract the most prevalent types of teacher immunity outcomes. Because of this, cluster analysis can be seen as introducing a degree of arbitrariness into the data analysis. Secondly, due to the acknowledged challenges of recruiting language teachers as research participants (Hobbs & Kubanyiova, 2008), the 16% response rate left open the possibility of self-selection bias in the sample of respondents. It is also possible that a more varied sample, perhaps even including L2 practitioners from various geographical and language learning contexts, would have resulted in more robust results. And while respondents were distributed across the spectrum of teacher immunity outcomes, which suggests a meaningful dataset despite the sampling concerns, one lone cluster which did not fully correspond to the qualitative descriptions from the focus-groups was unaccounted for. This stand-alone cluster may

not have shown up precisely because it was a halfway type, meaning that developmentally it shared partial characteristics with more than one fully immunized archetype.

7.1.4 Validation study phase III

Focusing on the processes that led a system to produce a particular outcome is the ultimate goal of an RQM research design. Thus, having corroborated the existence of these six phenomenological archetypes of language teacher immunity, in the final study in-depth interview data collected from three teachers in each archetype were used to explore the individual trajectories of development for each outcome, and investigate the manner in which the various archetypes manifested themselves in L2 teachers' sense of professional identity and motivated behavior. The data offered substantiating evidence for mapping these dynamic trajectories using the blueprint outlined in the first exploratory study (see Table 12). Taking the teacher as the complex system in which self-organized change occurs, teachers experienced necessary perturbations to initiate the developmental pathway in the *triggering* stage; teachers then adopted adaptive coping strategies that resynchronized the behavior of the system in the *linking* stage; during the *realignment* stage the dynamics of the system undergo a phase change which restores stability and leads to a new-found coherence in the system; finally, in the *stabilization* stage, the emergent outcome settles into an attractor state as teachers internalize it as part of their professional identity through analytical narratives.

The data also revealed that language teacher immunity played a reciprocal role in these teachers' professional identities. The finding that teacher immunity outcomes

are solidified through identity narratives that consciously recognize and legitimize personally meaningful events and actions indicates that teachers' experiences simultaneously fuel both their identity work and the developmental process of immunity formation. Thus, not only does teacher immunity draw on and shape the very experiences that form the basis for these narratives, constructions of professional identity were by necessity also consistent with the characteristics of respective immunity archetypes. An additional finding was that teacher immunity archetypes affected how these L2 practitioners positioned themselves in the profession through their accompanying mindsets. These mindsets provided evidence that language teacher immunity archetypes are manifested in teachers' situated classroom behavior because they were activated to implicitly guide teachers' choices of action and responses to the contextual demands of their teaching. Teacher immunity outcomes were further displayed in the real-time classroom choices these practitioners made, suggesting that these teachers' emotions, teaching motivation, and instructional effectiveness hinged primarily on the respective outcome of language teacher immunity they have developed.

Although the interview data collected were appropriate for examining how the various outcomes of language teacher immunity impacted these teachers' sense of professional identity, one challenge was in piecing apart the signature dynamics of each system's development using data that was not longitudinal in nature. This is perhaps where the limitation of relying on interviews in the RQM research design can be seen: the complexity framework prioritizes more ecologically valid approaches to research, which would suggest that investigating processes of development requires data that reflects this temporal change. Thus, extracting the signature dynamics of a

system from data that did not have a dynamic time-series element itself was challenging. Additionally, identifying how the language teacher immunity archetypes manifested themselves in motivated behavior drew entirely on self-report interview data, rather than observations or another more objective measure of teacher practices. This choice was made primarily due to issues of scale and access. Collecting serial observation data from 18 teachers (see Table 4) would not only have necessitated ethical approval from multiple actors in each setting, but the logistics involved would also have made the scale of the project unmanageable for a single researcher in the time frame available. Thus, by working at one remove from actual classroom practice and examining reported teacher practices, identifying how language teacher immunity manifests in the instructional effectiveness of L2 practitioners involved a substantial amount of inferential analysis.

7.2 The Immunized Language Teacher

Through presentation of the research findings, my argument for the appropriacy of this *language teacher immunity* metaphor and the unique contribution it makes to knowledge in the field has revolved around several aspects. First, parallel to the development of a biological adaptive immune system, language teacher immunity develops as part of a defensive reaction to the instances of crisis that are an inherent part of L2 classroom practice. In adaptive immunity, opposing forces of growth and decay which exert an equal force on the system over time result in the self-organized (i.e., spontaneously coordinated) formation of emergent stability. Language teacher immunity, like this acquired immune response, does not come built in to the system but emerges through a self-organized process. Thus, language teacher

immunity is developed, not from a single interaction, but from the accumulated adaptation of the teacher-as-system to the disturbances which that system encounters. Because of its dynamic origin, this emergent stability of the teacher-as-system—which represents it settling into an attractor state—is not fixed or permanent, but is in fact prone to constant tweaking in response to contextual interests and demands. In addition to its corresponding process of morphogenesis, language teacher immunity's function is identical to the safeguarding purpose of biological immunity that is indispensable for a living organism. In the L2 teaching sphere, this means that language teachers may not last long in the profession without some form of protective immunity. The evidence in my data indicates that teacher immunity acts as a line of defense to the demands placed on L2 teachers, and the often traumatic experiences they encounter which result in emotional exhaustion and burnout.

Work in the fields of occupational, personality, and educational psychology has also proposed constructs that provide insight into the question of how individuals come to survive and thrive despite the experience of emotional upheaval and threats to psychological well-being. However, as my review of the literature also illustrates, the notion of safeguarding and buffering a system against disturbances and threatening circumstances—as previously conceptualized in constructs such as coping, resilience, hardiness, or buoyancy—does not account for the dual nature of the protective configuration developed in the L2 teacher. The metaphor of language teacher immunity is preferred because it allows the analogy between the two spheres of immunity to be taken further by considering that immunity in both cases falls into two main global outcomes: productive immunity and maladaptive immunity. In the language teaching context, immunity at times serves a necessary armoring purpose,

when it not only safeguards against the hazards of the profession, but also facilitates sound teaching practice and maximum teaching effectiveness. However, when manifested in its maladaptive outcome, it threatens the very functioning of the individual by mounting resistance to change, reduces teaching effectiveness, and hinders teacher reflection and development.

Finally, in parallel to the acquired immune response, language teacher immunity evolves into part of the organism itself—here the teacher’s professional identity—in order to shield against future attacks. Adaptive physical immunity begins locally but evolves into a system-wide phenomenon as it traverses the neuroendocrine system and becomes managed via the neuro-immunomodulation process. Analogously, teacher immunity is explicitly implicated in professional identity formation through the construction of powerful analytical narratives that are chosen to frame, and internalize experiences. The identity narratives that are part of the developmental process of language teacher immunity effectively give coherence to the teachers’ struggles for existence and, therefore, integrate teacher immunity into the more global scheme of professional identity formation. Language teacher immunity is tied up with professional identity formation, itself widely acknowledged as a key factor in the instructional choices of educators; consequently, language teacher immunity can be said to manifest itself in both the emotional and motivational profile, as well as the behavioral characteristics of language teachers. Thus, the unique contribution of language teacher immunity is that it offers a nuanced and balanced perspective of key concerns in language teacher psychology (e.g., emotion, motivation, and identity) and addresses teachers’ capacity to sustain their

psychological well-being, their commitment to the profession, and their investment in the quality of students' learning, the hallmarks of an outstanding L2 educator.

7.2.1 Productive immunity

Viewed from its instrumental perspective (i.e., the instrumental utility of language teacher immunity), a robust, productive variant of language teacher immunity is an adaptive outcome which affords an all-purpose, substantive immunity against the chronic demands of the L2 teaching profession—these include the oppressive workloads imposed; professional relationships characterized by hostility and bullying; and the emotionally exhausting interactional demands of teaching. In addition to this, it provides a specifically-tailored episodic immunity to acute situated experiences such as the threat of a lawsuit; managing a student's substance abuse; or being terminated unexpectedly. In this regard, the cumulative protection of language teacher immunity parallels the biological immune system, which includes the specific local immune responses to certain diseases (e.g., as a result of antibodies being built through vaccinations or previous encounters with antigens) but also refers to the robustness of the general system as a whole to maintain or restore homeostasis in its host.

Rather than a built-in trait or disposition, language teacher immunity should be seen as a situated construct which emerges in relation to conflicts that are specific to the L2 teaching environment and is activated in the L2 teacher's classroom behavior. Conceptualized this way, a productive language teacher immune system has the following characteristics:

Specificity: language teacher immunity provides L2 teachers with the means to recognize, differentiate, and gear an appropriate response to particular episodic disturbances or instances of vulnerability that they encounter in their practice through the repertoire of adaptive coping strategies they have developed. For example, Vivian, a *Spark Plug* archetype, de-escalated the threat of a lawsuit from a parent incensed at their child's poor achievement on a high-stakes exam by inviting the parent to observe and participate in the L2 learning environment.

Memory: language teacher immunity capitalizes on prior experiences of upheaval mastery to inform the L2 teacher's strategic response options to subsequent disturbances intelligently, and—through the increase of teacher self-efficacy—eventually becomes anticipatory so as to self-regulate the teacher's equilibrium adaptively over time. For instance, Hyo, a *Spark Plug* archetype, used journaling with her students to help them acknowledge and resolve recurring incidents of classroom aggression and violence.

Adaptability: language teacher immunity contains a facet of resilience that evolves and adjusts constructively in response to changes in order to ensure that the L2 teacher can bounce back from adversity and can function optimally despite a barrage of attacks. By illustration, Sam, a *Visionary* archetype, continued to function positively and successfully in his L2 classroom despite being notified that he would be terminated by the school at the end of the semester.

Durability: because it is solidified into L2 teachers' professional identity through narrative reasoning, language teacher immunity sustains its protective armoring capacity against stress, failure, and burnout in spite of recurrent threats to the language teacher's well-being and classroom effectiveness. For instance, Carrie, a

Visionary archetype, is consistently effective at addressing the broad spectrum of student needs in her class despite yearly curriculum changes and shifting objectives of educational reforms.

7.2.2 Maladaptive immunity

One clear implication from the data reported in the previous section chapter is that particular outcomes of language teacher immunity do not serve the L2 teaching profession well, such as cases in which the residue of experience solidifies into a permanent and maladaptive rigidity or resistance. Although maladaptive immunity closely mirrors its productive alter-ego with regards to global function, it generates a skewed defense mechanism through the embedded coping responses to incongruence threats to the self-concept. Typical examples of defensive responses would be when language teachers develop extreme risk-avoidance, evade innovative methodologies, exercise mechanical control routines, and in general display inertia and fossilization. While defensive coping may be beneficial in self-regulating against stressors in the short-term, the coping literature also makes it clear that these defensive mechanisms are insufficient for long-term adaptation to upheaval (Carver, Scheier, & Weintraub, 1989). Because of this, defensive coping through repression, denial and displacement, self-handicapping, and making external attributions often becomes debilitating.

In teachers' self-regulatory efforts to reassert control over conditions of uncertainty or stress, one particularly toxic coping strategy is the tendency to fall back on defensive attributions of control over life events or the environment they find themselves in—what are essentially illusions of control and efficacy (Presson & Benassi, 1996). Teachers' sense that they can exercise personal choice and control

over the conditions and contingencies of their L2 practice can sustain their well-being; however, because these judgments often also include overgeneralizations, this false sense of efficacy is closely tied to the distorted and faulty narratives teachers construct which cement the maladaptive outcome into their professional identity. Affected teachers may also appear jaded and seem to have lost their zeal and sense of wonder. Over time, this maladaptive strain of language teacher immunity manifests itself in distinct archetypes which may reconfigure around self-serving apathy, complacency, and a jaded indifference (*Sell-out*); around resignedness, callousness, and cynicism (*Defeated*); or around conservatism in pedagogy, and aversion to change (*Fossilized*). Phenomenologically, such well-known and easily-recognizable characteristics of a segment of the L2 teaching profession can be seen to some extent as unintended consequences of a maladaptive language teacher immunity.

These warped language teacher immunity outcomes, parallel to the aberrant responses from biological immunity, can have crippling consequences when they produce a response to eradicate things from the system which are not harmful or which are necessary for continued survival. Occasionally, language teachers who receive input, feedback or advice that is intended to increase their effectiveness interpret this as a threat to their survival and choose consciously and intentionally to resist change or innovation. Resistance to change is a central theme of the teacher change literature and has been examined from the filter of one's apprenticeship of observation (Lortie, 1975), and more explicitly in response to reform input (Gregoire, 2003; Kubanyiova, 2012). Individuals confronted by threats that undermine a prevailing view of self become preoccupied with avoidance strivings in order to protect the self-concept, and this is exacerbated the higher the personal stakes

(Sedikides, 2012). When construals of a language teacher's professional identity are challenged the insecurity associated with restructuring the self-concept inhibits growth. Ultimately, this well-documented aversion to change may interfere significantly with the language teacher's ability to meaningfully reflect on their practice and develop as a professional, with potentially detrimental consequences for learners they come in contact with (Cole, 1997).

Additionally, within the developmental framework of CT, a system's degree of settledness is directly linked with its degree of effectiveness (Eve, Horsfall, & Lee, 1997). From the system's perspective, this maladaptive form of immunity is convenient as it allows the system to survive; however, this excessive stability impedes further self-organization in the system because it suppresses its internal dynamics (Larsen-Freeman & Cameron, 2008a). Therefore, although the attractor state of maladaptive immunity may appear synchronized and cohesive on the surface, and may afford the teacher a measure of protection, like the biological symptoms and manifestations of allergy and autoimmunity it can become a professional liability and lead to such L2 teachers as those who are fossilized and have plateaued, those who have sold-out and are barely doing the bare minimum to get by, or—partially even—those who are defeated and suffer from the teaching equivalent of learned-helplessness. I have suggested, in an earlier chapter, that the potentially serious consequences of maladaptive language teacher immunity raise immediate questions regarding whether and how this imbalance can be redressed. One key consideration here concerns its initial emergence and whether the self-organized formation of maladaptive teacher immunity can be influenced or altered, and how intervention

might be introduced into this developmental process. It is to these questions I now turn.

7.3 Implications for Second Language Teacher Education

My findings, while preliminary, suggest that one of the main factors which sets language teacher immunity apart from any other protective quality is its capacity to have a dual effect. The issue that emerges from my findings is that while language teacher immunity is an indispensable defense shield, the potential danger exists for it to become overprotective and lead to a counterproductive rigidity and conservatism, thereby inhibiting change and growth in the language teacher. Language teacher immunity, thus, is double-edged in nature. The implications arising from this finding suggest themselves immediately and relate specifically to language teacher education: in order to ensure that teachers at every stage in the profession remain motivated and committed to teaching, innovative and productive in their practice, and emotionally well-adjusted despite setbacks, the foremost goal of second language teacher education should be to assist teachers in developing a robust, productive form of language teacher immunity. Here, however, a potentially contradictory theoretical issue presents itself: if the emergence of language teacher immunity is indeed the function of self-organization, as the combined data suggest, how will it be possible to direct this process of development in the teacher, or even more critically, to “reboot”—a term used in biological immunology to describe the resetting of an organism’s natural immune response—the outcome characterized by inertia and

fossilization to enable it to reform into the desirable safeguard of productive teacher immunity.

Initial consideration may suggest that teachers' maladaptive defense systems will need to be torn down and completely rebuilt. This would be a large-scale operation and not necessarily an easy solution because it requires reformulating the whole of the teacher's identity. While this massive restructuring may be possible in principle, in practice it may be too ambitious and therefore an unrealistic task. The pragmatic question then is whether there are any halfway measures that might start a gentler process of restructuring. In other words, how can the boundaries of maladaptive teacher immunity be made more permeable without weakening the underlying structure of the defense? Although my review of central complexity concepts in chapter four suggests that intervention in systems' development may resemble repairing a car as it is rolling down the highway, there is a good chance tweaking the system by modifying its internal parameters will result in the system incorporating these and self-organizing in the desired direction. Further insights from the theoretical framework of complexity are particularly pertinent to this conundrum.

Recent work has begun to conceptualize language pedagogy using insights from complexity theory (Mercer, 2013, 2016). One key principle from this scholarship, in line with my earlier review of the complexity literature, is that language development, classroom settings, and classroom practice are not deterministically predictable. A mechanistic way of thinking about language pedagogy and, by extension language teacher education, is compelling because of its simplicity, coherence and apparent completeness. Thinking like this is also consistent with human intuition and common sense (Juarrero, 1999). However, it cannot tell how

multiple things and processes act together when exposed to various influences at the same time—a hallmark of the systems perspective (Gorochowski, di Bernardo, & Grierson, 2011). My results indicate that language teacher immunity outcomes are multi-determined, and that no single element, input or force controls the trajectory of change. Instead, system-level behaviors emerge from the relationships and connections deep inside the language teacher-as-system. Thus, path-dependent development does not impede intervention, and while the essence of self-organization is its spontaneity, the most valid way of intervening in the signature dynamics may be through “playing around” (Goldstein, 2011, p. 97) with the parameters for key stages and imposing new inputs into the developmental trajectories.

In line with the principle from complexity suggesting that an initial equilibrium must be disrupted for a system to self-organize into a qualitatively new state, recent models of teacher conceptual change, both theoretically motivated (Gregoire, 2003) and empirically grounded (Kubanyiova, 2012) are implicit that the impetus for change can only transpire if the current, prevailing state of affairs is seen as crucially lacking something. This is also one of the cornerstones of Kubanyiova’s (2012) recent theory of Language Teacher Conceptual Change (LTCC), which offers powerful insights within a teacher cognition framework about how to induce transformational change in teachers’ educational beliefs and practices. The model suggests that at least three ingredients are needed to initiate any meaningful and lasting change in teachers’ motivation and practice. First, change requires creating a *positive vision* with resonance for the individual practitioner that helps them engage more deeply with the message of change. Second, it necessitates introducing some sort of a *dissonance* to dislodge the teacher from their non-optimal comfort zone and prove that change is

needed. Finally, it entails providing goals and *procedural guidelines* supported by a safety net of *hope* that can help teachers to achieve change (Dörnyei & Kubanyiova, 2014). Because it is something that requires deep-seated change, restructuring the developmental cycle of the maladaptive outcomes of language teacher immunity may capitalize on similar principles to LTCC, employing a related sequence to its initial self-organization. While some of the details will need to be fine-tuned by implementation, and this corresponds with a major agenda for future research, the parallels to the process of teacher conceptual change suggest that rebooting maladaptively immunized language teachers involves three necessary components:

- (a) Triggering dissonance in the process through *awareness-raising* of the fact that the existing form of language teacher immunity is in fact counterproductive;
- (b) Making available a repertoire of alternative *coping strategies* that might provide language teachers with possible new answers to old questions;
- (c) Lastly, assisting in the creation of *narratives of resolution* that language teachers can subscribe to and personalize in order to stabilize the new identity.

These steps are compatible with the developmental blueprint of teacher immunity formation because they are positioned for intervention at key stages of the self-organized process: the triggering stage, the linking stage, and the stabilization stage. Below I examine these three moves in greater detail.

7.3.1 Re-triggering: Raising awareness in the mind of the L2 teacher

One preeminent danger of maladaptive immunity is its stealth. Most language teachers are unlikely to be aware of its existence, its importance, or its capacity to backfire as a fossilized, callous resistance. Therefore, bringing it into teachers' conscious frame of reference and drawing attention to its counterproductive features through awareness-raising is critical to rebooting the formation of language teacher immunity. Given that a perturbation is necessary to dislodge a system from its current state of equilibrium, awareness-raising is likely to act as a trigger that launches a new iteration of the developmental process. Used for this purpose, awareness-raising—like teacher reflection—can be seen as both a metacognitive mechanism as well as a social practice (Farrell, 2015). This is also crucial given that many teaching settings lack the conditions necessary to facilitate thoughtful reflection and learning by teachers (Loughran, 2002). Thus, this move exploits the first stage in the self-organized development of language teacher immunity, using it to highlight that the initial developmental trajectory has gone awry. Metaphorically this could be seen as similar to hitting “CTRL-ALT-DEL” in the functioning and the formation of language teacher immunity. The viability of this stage reflects recent moves to foreground awareness-raising in several areas of SLA (Sanz & Leow, 2011), and the actual discussion could be accomplished in more controlled and supportive settings than teachers' day-to-day practice. For instance, raising awareness of the maladaptive outcomes of language teacher immunity may become one fundamental objective for pre-service teacher education workshops or in-service professional development seminars. And while it is true that micro-engineering all aspects of an emergent, self-organized outcome such as language teacher immunity may not be possible within the

limited parameters of pre- or in-service teacher education, resetting the controls in the developmental framework to default is likely to be the most sensible way to course correct the trajectory of immunity formation and set it into motion again.

7.3.2 Re-linking: Transforming coping strategies

Once the system has been dislodged, the next move will be to exploit the linking stage in the self-organized process of teacher immunity development. Here, positive alternatives to the traditional response patterns of maladaptively immunized teachers are needed. This stage, thus, requires new strategy links to be made. The counterproductive coping strategies embedded within maladaptive teacher immunity typically include avoidance-oriented behaviors such as repression and denial, self-handicapping, and self-isolation to avoid change or taking responsibility. These defensive mechanisms typify the maladaptive archetypes seen in my presentation of the data above. While it is not likely that a “silver bullet” exists to solve all of the problems a language teacher encounters, a large body of research indicates that healthy coping behaviors do in fact help teachers to view life events as controllable, to see a sense of challenge in them rather than an imminent threat, and to tolerate or adjust to the negative events when all else fails (Gold & Roth, 2005). Core strategies that well-adjusted teachers use include:

- Thinking about the positive and looking on the bright side of things as this optimism will in turn reinforce teachers’ positive feelings and hope.
- Avoiding negative thinking by noticing it when it occurs, backing up and then reframing events through more productive attributions.

- Troubleshooting the problem head-on because repressing it or giving up on making a change would make things spiral out of control.
- Focusing on solutions and looking at multiple different approaches to resolve the conflict, even options that appear risky or unorthodox.
- Developing an outlet for stress and building supportive relationships and friendships to fall back on.
- Seeking social and professional support from inside and outside the workplace in order to share problems and even ask others for help when it is needed.
- Being proactive and anticipating problems that may arise in order to prevent minor conflicts from escalating.
- Believing in their capacity to cope no matter how tough life gets.
- Maintaining an emotional equilibrium through mindful awareness and emotional regulation.
- Maintaining a strong sense of self that includes elements of efficacy, competence and mastery.

An important corollary to the self-organized nature of teacher immunity development, in which strategic responses in the linking stage are soft-assembled and emergent, comes from the learning strategy research in second language acquisition. In general the behaviors implied as being more effective, desirable, or productive should not be imposed on the subject, but rather offered as attractive choices for self-generated discovery and learning (Dörnyei & Ryan, 2015; Oxford, 2013). This is also important given the realities of reduced teacher autonomy and the struggle for teacher agency in many language teaching contexts. Not only is attempting to overtly engineer (i.e., in a preordained, top-down manner) the use of specific strategies in

response to the instructional challenges that teachers face unlikely to be adequately contextually sensitive or respect the teachers' own agency, it is also counter to the principles of emergence and self-organization. For this reason, the explicit awareness-raising discussion which recaptures the necessary dissonance of the triggering stage should be followed by language teachers identifying and reflecting on their previously-used coping strategies, in order to appraise existing best practices and role models available for their own future experimentation and ongoing re-evaluation. This might also be accomplished through productive mentoring partnerships that are designed to provide a non-evaluative, enabling support network for language teachers—much like with leadership programs in place at many corporations.

Teacher mentoring is not a new idea, although by some estimates it is only prevalent in 25-30% of teaching contexts worldwide (Moir, Barlin, Gless, & Miles, 2009), perhaps due to the inherent logistical drawbacks. The main function of the paired relationship of a mentor and protégé is to avoid the abrupt and unassisted entry into the teaching profession that would otherwise occur (Wang, Odell, & Schwille, 2008). Some of the key goals of existing teacher mentorship programs are (a) more rapid and effective integration of novice teachers; (b) the increased transfer of high-leverage teaching practices from one cohort of teachers to another; (c) enhanced communication, commitment, and motivation; (d) gains in productivity and performance; (e) better retention of quality professionals; and, (f) providing stability in times of change (Portner, 2008; Ingersoll & Strong, 2011). However, the mentorship required within the scope of reforming a language teacher immunity outcome draws less on the social aspect of learning to teach per se, and more specifically on learning to exercise control over the challenges of their daily

experience by reflecting on their attributions, emotions, goals, and strategic behavior. Mentorship relationships that impact the rebooting of maladaptive language teacher immunity will necessitate the teachers involved from both ends of the spectrum finding common ground in their professional knowledge and sharing common reference points from their experience. In developing ideas for rebooting maladaptive forms of teacher immunity, it is important to reject the misconception that it is sufficient to only change a few principles underlying its design. Because teacher immunity development implicates identity formation, the deciding factor that determines the qualitative changes possible in their developmental trajectory is the link with the individual teacher as a person. Consequently, the type of mentorship that empowers maladaptively immunized language teachers to exercise more control over their professional identities may be the key to ensuring deep-seated change, and restructuring in the developmental cycle of language teacher immunity. It is to this idea I now turn.

7.3.3 Re-stabilizing: Narrating language teacher immunity

While the data indicates that language teacher immunity is a protective mechanism that develops in response to a teacher's exposure to adverse experiences, this characterization only partially explains what the construct of teacher immunity constitutes—in reality what develops is much less attribute-like than it is a part of individual identity construction. This aspect ties back to the final stage of the developmental blueprint highlighted in the data, stabilization. For teachers, making sense of the uncertainty and adversity that is part of their experience and gaining positive insight from these events is a crucial factor in acquiring a professional

identity (Golombek & Johnson, 2004). Experiences can be processed in a number of ways, and the specific way in which L2 teachers self-narrate their immunization process into their identity will affect the outcome of teacher immunity that develops. At times this autobiographical reasoning is displayed in a repertoire of stock attributions produced to explain stressful stimuli or put things into a perspective of personal continuity (e.g., “I am doing my best, but I am not super-human”; “Every class is mixed-ability, so I just teach to the middle of the class”; or “You can’t save every student, so it’s not worth losing any sleep over it”). Thus, language teacher immunity is bound up in identity formation through narratives.

If a teacher embraces and reflects on negative experiences, is open to learning and changing from them, and actively works towards resolution, they can ensure a sense of closure and positive restoration, while incorporating these events into their narrative and maintaining continued coherence in their identity (Helsing, 2007). This pathway corresponds with the robust productive teacher immunity outcome. However, struggles with challenges can just as easily result in maladapted narrative outcomes, and there are times when individuals construct faulty narratives that actively inhibit development and growth in their professional identity (Pals, 2006). When teachers form narratives that do not allow for benefit-finding from adversity they may in effect doom themselves to randomness and meaninglessness in their professional life (Geijsel & Meijers, 2005). This would account for the maladaptive teacher immunity outcome. Identity and the self—both the core and situational selves—are central to who an individual thinks they are, and who they act as in social contexts. Thus, narratives are particularly pertinent to language teacher immunity because they are the layer which determines the precise configuration around which the development

stabilizes, and they act as the interface between the underlying developmental process and the phenomenological reality of things.

Integrating identity-challenging experiences into one's life narrative constructively is a necessity for benefit-finding from adversity—scholarly work on narrative identity is unequivocal on this point (Bauer, McAdams, & Pals, 2008). Likewise, in order to solidify a new practice, L2 teachers will need new, productive narratives to subscribe to and draw on. Because they correspond to episodic experiences which teachers frame in a unified and purposeful thematic arc, such narratives will inevitably be highly situated. However, by linking back to ideas afforded by my review of the literature, it is possible to outline three broad narrative dimensions, narratives of tolerance, narratives of congruence, and narratives of exploration.

Tolerance narratives: Tolerance is the intentional failure of an immune system to mount a response to an antigen (Rose, 2008). It is through this intelligent immune modulation that an organism can avoid hazardous allergic responses of autoimmune rejections of transplanted tissue. Similarly, within a profession such as teaching, it is chiefly openness and tolerance of ambiguity that allows individuals to reason that change is an opportunity for growth and development rather than a threat (Gregoire, 2003). The main thesis of this aspect is the utilitarian narrative that emphasizes not only that the inconvenience of risk-taking is a natural and inevitable part of development for teachers, but also that the payoff looming in the end makes the potential hardships worthwhile. A parallel example from conflict resolution in group dynamics is the conflict-ridden, yet necessary, storming phase of the group maturational process (Dörnyei & Murphey, 2003). If teachers adopt a tolerance

narrative that frames instances of hardship as a necessary stage for growth to a new, superior level of professional maturity, they will weather the storm of adversity in their daily practice and process it analytically so that the developmental process stabilizes into an appropriately productive attractor state. Consequently, from a cost-benefit perspective, teachers who internalize this narrative into their professional identity will see that it is not only possible but also beneficial to ride the storm.

Congruence narratives: Teaching is often associated with a sense of calling, and indeed many language teachers enter the profession with an idealistic vision (Dörnyei & Kubanyiova, 2014). Undoubtedly, some aspects of this vision are often quickly shattered by the shock of reality, with devastating effects for teachers' emotions, motivation, and practice. The vulnerability which characterizes many teachers' workplace interactions and experiences may result in teachers engaging in defensive teaching out of fear (Bullough, 2011). However, if teachers can build a narrative of congruence for their actual selves which reduces the discrepancy between their actual and ideal selves, and reincorporates elements that originally inspired them to enter the profession this may lead to greater meaning and purpose. This congruence narrative in fact mirrors the way in which productively immunized language teachers filtered their daily practice through a lens of fidelity to self. It was this that allowed them to engage in sense-making and construct personal meaning from adverse experiences by forming a match between their authentic self and the experiences that are part of their practice. Constructing a narrative which frames a teacher's experiences as not fundamentally at odds with who they are will distance a teacher's actual self from their feared-self, and instead align it more closely with the aspirations, hopes and desires that make up that teacher's ideal self. This congruence narrative

may potentially reshape the trajectory in which their language teacher immunity develops.

Exploratory narratives: The third potential angle for positive narrative construction would be stimulating language teachers' desire to explore pathways for development by appealing primarily to their ideal self-image as a practitioner (Hiver, 2013; Dörnyei & Kubanyiova, 2014). Imagery and vision are central parts of the personal investment involved in being a teacher, and teachers overwhelmingly aspire to be the best they can in order to make a real difference in the lives of their students (Bullough & Hall-Kenyon, 2011). Admittedly, the discourse of increasing one's professionalism can be problematic as it too often involves external imperatives insidiously disguised as standards or targets, and a diminished sense of agency. Clearly, this angle of positive narrative construction must relate to the more intrinsic, ethical, and moral desire to pursue a higher level of exploration that accompanies the pursuit of master craftsmanship in their teaching practice. Thus, teachers who can construct inspirational narratives that tap into a growth mindset may also achieve a greater depth of understanding of self that helps them to embrace the need to learn, grow and get better by making adjustments (see also Mercer & Ryan, 2010). Through these strong, vibrant exploratory narratives teachers will be more likely to explore how they can improve and what they can learn in the face of setbacks, and will embrace the possibility of trying new things, failing, learning, and growing (Dweck, 2006).

Rebooting the self-organization process of teacher immunity and replacing some of the faulty components in the system is likely to result in a new state of affairs. This new outcome is unlikely to be the perfect state and therefore occasional

reiterations of the process might be beneficial. In this sense, continuing teacher development might be perceived as recurring cycles of awareness-raising of current states and brainstorming further options and strategies in order to give the system a chance to find the most productive and comfortable position to settle in.

7.4 Bridging Language Teacher Motivation, Identity, and Cognition

Teaching is about creating the conditions that will inspire students with excitement and the drive to learn. Consequently, one of the key contributions of this research on language teacher immunity is its potential as a superordinate construct which integrates understandings from teacher motivation, teacher emotion, and teacher identity into a unified framework for what ensues inside the mind of the language teacher. If, by extension, a more ecological perspective of the language classroom is taken, learner vision cannot flourish without teacher vision, and for this reason teachers' emotions, goals, enthusiasm and hope can all be contagious and generate real cognitive counterparts in students (Dörnyei & Ryan, 2015). Recent insights from positive psychology further underscore the importance of teachers' engagement, and hope because these elements of professional identity are inextricably tied to how teachers approach their classroom practice (see e.g., MacIntyre, Gregersen, & Mercer, 2016). A teacher who hopes to foster positive capacities in their learners must first develop those capacities internally. However, if that teacher is disengaged and lacks vision, this is just as readily transmitted to students through the socially-mediated encounters of the language classroom, with a potentially devastating impact on students' own learning and processes of sense-making. My data on teacher

immunity further suggests that, because teachers quite literally bring themselves into the classroom, characteristics of teacher immunity are inseparable from respective teachers' mindsets and emotions, their motivation, and their classroom behavior. This highlights the importance of working within the process of teacher immunity formation to support language teachers not just materially as educators, but more essentially in the individual struggle to construct an identity of awareness and fidelity that enables them to withstand ambiguity and conflict, draw on reserves of energy and vision, and sustain productivity in their daily practice.

Language teaching, as with teaching more generally, is not for the faint of heart. It is a task that for many is fraught with vulnerabilities, conflicts, and hardship. All schools and teaching contexts present their own particular challenges, suggesting that a teacher without an appropriate protective shield may be prone to developing a condition of general dysfunction, and succumbing to exhaustion, inefficacy, and cynicism. Thus, developing some form of immunity is a necessity for language teachers to maintain a form of professional equilibrium. Such an immunity, however, carries the danger of a substantial backlash, and therefore it can be argued that one of the key issues that the language teaching profession currently faces is what might be called an immunity challenge. While, language teacher immunity is a useful defense mechanism that allows language teachers to function in a hopeful and constructive way, maladaptive immunity may be a leading factor which inhibits teacher change and growth, and contributes to the pervasive conservatism and rigidity in the language teaching profession. In response to this challenge, through raising consciousness, making available transformative strategies and providing attractive alternative narratives, the immunity outcome might be rebooted so that it redevelops into a

productive dimension which is compatible with change, growth, and reflective practice.

Clearly, scrutinizing these teacher immunity outcomes, their pathways of emergence, and their phenomenological manifestations raises entirely new questions regarding what can be done to more appropriately prepare and mentor language teachers, particularly in light of the potential value of language teacher immunity to bridge individual and contextual concerns in language teacher psychology. The data from my research exploring and validating the teacher immunity construct corroborates the message increasingly coming from language teacher education research that more than merely focusing on training or educating teachers about the what and how of teaching, teacher preparation should involve the who and why to enable practitioners to develop and elaborate a core identity (Trent, Gao, & Gu, 2014). Identity is firmly accepted as a key determinant of teachers' effort, instructional effectiveness, psychological well-being, and commitment to the profession (Akkerman & Meijer, 2011; Beauchamp & Thomas, 2009). The data reported in this thesis show that classroom technique, while often the most immediate concern of teachers and those responsible for their preparation, can only be seen as a surface-level manifestation of teacher immunity. Mindsets (Dweck, 2006) also provide an informative lens from which to view practice, but these too are one step removed from the development of language teacher immunity. What is required instead to bridge these central concerns, as Jenlink (2014) proposes, is a pedagogy of identity. This pedagogy of identity also accords with findings in language teacher conceptual change (Kubanyiova, 2012). A focus on development of technique often overrides the more crucial process of development of identity, but this may be naïve and ethically

dubious if these desired external manifestations are incongruous with deeply held beliefs or components of teachers' identity—this holds true particularly when those construals are subconscious (Geijsel & Meijers, 2005). The data from my research also indicate that, because language teacher immunity is simultaneously narrated into being as a process of consciously recognizing and legitimizing accrued experiences and draws on and shapes the very experiences that form the basis for these narratives, its formation is bound up at the heart of teacher identity.

Phenomenologically, many language teachers do become entrenched in non-productive states, but outcomes of disillusionment and cynicism are by no means inevitable. Nothing about language teacher immunity is static, hopeless, or unalterable because even the maladaptive outcomes contain the seeds of their own renewal. Above, I have suggested key ways in which the self-organized trajectory of language teacher immunity can be rebooted—for instance by adopting a repertoire of alternative coping strategies and constructing narratives of resolution. The rationale for these comes from the conceptual tools that are part of self-organizing processes. Teacher immunity outcomes at any point on the spectrum are essentially settled patterns within the same terrain. At the heart of complex phenomena such as teacher immunity, however, lies change and adaptation. Complexity is a theory of change and possibilities (Davis & Sumara, 2006), and seeing the dynamics of this change as a promise for hope and new possibilities rather than as a source of unpredictability or trouble can reveal the constructive channels also available for productive outcomes to emerge. Assuming, first that many language teachers are likely engaged in a subconscious process of immunity development, and provided that teacher immunity outcomes have the capacity to integrate teachers' emotions, motivations, and their

professional identity, it is then in the interests of all to encourage the robust, productive variants to emerge. Self-organization carries the hope of change in everybody and every situation, and language teachers who have lost their vision and motivation can be made visionaries again. In a sense, “Sauls” can become “Pauls”.

8. Conclusion

This thesis was based on a rather simple premise, that language teachers who are motivated and committed to teaching, innovative and productive in their practice, and emotionally well-adjusted possess a singular psychological quality at their core—which other teachers have not managed to develop.

8.1 Findings Revisited

The picture which has emerged from data collected through a sequence of four research studies is the following:

Language teachers develop an emergent outcome, *language teacher immunity*, through the accrued disturbances that they encounter in their classroom experience. This teacher immunity appears to function primarily as a defense mechanism against the routine material and emotional demands placed on L2 practitioners. It provides an indispensable meta-regulatory function necessary to maintain a form of professional homeostatic equilibrium, allowing teachers to bend but not break. For this reason, developing some form of immunity appears to be a necessity for language teachers to survive and avoid becoming disillusioned and throwing in the towel.

Broadly speaking, teacher immunity is an integral part of a language teacher's professional self-concept and its development has a significant effect on various aspects of a teacher's motivation, emotion, and even classroom practice. More specifically, teachers' self-images, their persistence towards goals and aspirations, and their self-efficacy—factors which shape their professional behavior both in and out of

the classroom—are tied to teacher immunity. As such, its existence may color the beliefs, assumptions, and attitudes that language teachers hold about their work.

Due to its central role in a language teacher's formation of their professional identity, teacher immunity may further explain key processes in teacher development such as self-regulatory action and conceptual change. Specifically, maladaptive autoimmunity may be a leading factor which inhibits teacher change and growth and contributes to the unparalleled conservatism and rigidity in the language teaching profession. Because of this, teacher immunity may also provide a foundation for the literature on language teacher conceptual change.

Despite its central importance to their self-concept and practice, language teachers may not be aware of its existence, its importance, or its capacity to backfire as a fossilized, callous resistance. By understanding the characteristics of both the productive and harmful outcomes of teacher immunity and how each develops, there may be ways of avoiding counterproductive influences and turning teacher immunity into a tool which is compatible with change, growth, and reflective practice.

Perhaps most notably, teacher immunity can be a factor that enables creative and open-minded teachers to remain motivated and thrive, provided they develop a productive and robust variant. Seasoned teachers with healthy immunity assess disturbances, rationalize their underlying causes, and process them productively. For this reason, teacher immunity may equip language teachers with a strong sense of agency that allows them to respond competently to adversity, and with pathways to triumph over it inventively.

8.2 Limitations and Directions for Future Research

One of the main limitations of my research concerns the sampling of respondents. The sample of teachers in each of the four studies was recruited from a single context, South Korea. And, while my overview of the context illustrates that Korea is in many ways typical of other second language learning contexts worldwide, it is also likely that a more varied sample that includes L2 practitioners from various geographical and language learning contexts, would have resulted in more robust and compelling results. Extending this even further, peer reviews of several articles based on this research have raised the issue of whether teacher immunity is specific to the language teaching profession or is in fact symptomatic of classroom practitioners in general. Based on the modest scope of the existing results, it is not possible to offer a definitive answer regarding the field-specificity of teacher immunity, and because this thesis draws on a wide range of literatures (e.g., multiple domains in psychology; human immunity; complexity theory) some of the ideas may not be of exclusive interest to L2 practitioners. However, because the concept emerged from the study of the motivation, emotion, and identity of L2 teachers, it is of greater immediate interest and relevance to the applied linguistics field than any other.

A second limitation of the overall research design is that, as mentioned earlier, I have relied exclusively on non-longitudinal data to investigate the developmental process of language teacher immunity and the signature dynamics of each system. Thus, piecing apart the signature dynamics of each system's development using data that did not have a dynamic time-series element itself may have left certain ideas unexamined. This is also a relevant methodological issue given the dynamic nature of language teacher immunity itself: I have established the existence of certain salient

outcomes but the research design did not take into account the fact that these attractor states are, by definition, dynamic and adaptive states of equilibrium subject to ongoing development and change. Particularly as regards teachers in the halfway Defeated outcome, there is every indication that their developmental trajectory is not over and that further self-organization will likely result in one or another fully-fledged outcome of teacher immunity emerging.

Suggestions for potential directions of future research correspond with these limitations. First, further validation of the construct of teacher immunity might involve fine tuning and administering the teacher immunity questionnaire to a stratified sample of language teachers from a range of geographical and language learning contexts. The teacher immunity scales could also be evaluated against various outcome measures that are commonly used in mainstream teacher research, including teacher attrition, student perceptions of teacher effectiveness, student engagement, and even impact on student learning over time. The longitudinal aspect will also be an important part of a future research agenda for teacher immunity. First tracking teachers throughout the development of their particular language teacher immunity outcomes will shed further light on the nuances of the self-organized formation and signature dynamics of each. Furthermore, tracking teachers with the various teacher immunity profiles over time to collect in-depth observational data will likely reveal much more about how the various teacher immunity outcomes manifest themselves in teachers' sense of self and motivated behavior. These future avenues for research might employ novel, dynamic research methods, such as process tracing or agent-based modeling, that allow analysis of teacher immunity on a range of appropriate timescales and levels of granularity.

Additionally, what remains completely uncharted territory is the impact of intervening in the development of teacher immunity. Future research will need to build on current findings by exploring a program of in-situ intervention for maladaptive teacher immunity outcomes that works within the self-organized process and evaluates ideas, some of which were proposed in an earlier chapter, for rebooting the process and guiding it to a more productive outcome. If “teachers matter”—and the research clearly says that they do (Day, Sammons, Stobart, Kington, & Gu, 2007)—much more attention will need to be paid to supporting their continued well-being and growth by raising awareness of their specific strengths and weaknesses, providing the guidance they need to cope with the challenges they encounter, and identifying more effective measures in building and narrating their professional identities. Actionable data could be collected in several ways by implementing voluntary, yet still genuinely meaningful, mentoring programs that partner maladaptively immunized language teachers with productively immunized colleagues; and, by making some form of explicit and informative program about language teacher immunity a part of teacher education both for pre-service teachers and novice language teachers at the immediate outset of their career.

The goal of this thesis has been to investigate the concept of language teacher immunity, a useful metaphor in understanding L2 teachers’ motivation, identities, and experiences, and these initial ideas will undoubtedly need fine-tuning by further research. Such efforts may be justifiable, because if a robust, productive teacher immunity does indeed imbue language teachers with resilience, enthusiasm and hope, the carry-over effect on student learning may be profound. No longer focused on defensive teaching and self-preservation, productively immunized teachers are instead

more likely to strive to build environments conducive to language development, inspire students they work with, and achieve optimal growth and performance as professionals.

References

- Abraham, R., & Shaw, D. (1992). *Dynamics: The geometry of behavior* (2nd ed.). Redwood City, CA: Addison-Wesley.
- Akkerman, S. F., & Meijer, P. C. (2011). A dialogical approach to conceptualizing teacher identity. *Teaching and Teacher Education, 27*, 308–319.
- Alarcón-Riquelme, M. (2005). The genetics of human autoimmune diseases. In M. Zouali (Ed.), *Molecular autoimmunity* (pp. 55–67). New York, NY: Springer.
- Alexander, P. A. (2008). Charting the course for the teaching profession: the energizing and sustaining role of motivational forces. *Learning and Instruction, 18*, 483–491.
- Alexander, P. A., Grossnickle, E. M., & List, A. (2014). Navigating the labyrinth of teacher motivations and emotions. In P.W. Richardson, S.A. Karabenick, & H.M. Watt (Eds.), *Teacher motivation: Theory and practice* (pp. 150–163). New York, NY: Routledge.
- Al-Hoorie, A. (2015). Human agency: Does the beach ball have free will? In Z. Dörnyei, P.D. MacIntyre & A. Henry (Eds.), *Motivational dynamics in language learning* (pp. 55–72). Bristol, England: Multilingual Matters.
- Allred, K., & Smith, T. (1988). The hardy personality: Cognitive and physiological responses to evaluative threat. *Journal of Personality and Social Psychology, 56*, 257–266.
- Alsup, J. (2006). *Teacher identity discourses: Negotiating personal and professional spaces*. Mahwah, NJ: Lawrence Erlbaum.

- Anderson, P. (1994). The eightfold way to the theory of complexity—A prologue. In G. Cowan, D. Pines, & D. Meltzer (Eds.), *Complexity: Metaphors, models and reality* (pp. 7–16). Reading, MA: Addison-Wesley.
- Antonovsky, A. (1979). *Health, stress and coping*. San Francisco, CA: Jossey-Bass.
- Antonovsky, A. (1987). *Unraveling the mystery of health: How people manage stress and stay well*. San Francisco, CA: Jossey-Bass.
- Arifin, H. M. (2015). The influence of competence, motivation, and organisational culture to high school teacher job satisfaction and performance. *International Education Studies*, 8, 38–45.
- Austin, T. (2011). Language learner-teachers: Evolving insights. *International Journal of the Sociology of Language*, 208, 119–137.
- Baba, K., & Nitta, R. (2014). Phase transitions in development of writing fluency from a complex dynamic systems perspective. *Language Learning*, 64, 1–35.
- Baird, R., Baker, W., & Kitazawa, M. (2014). The complexity of ELF. *Journal of English as a Lingua Franca*, 3, 171–196.
- Bakker, A., Schaufeli, W., Leiter, M., & Taris, T. (2008). Work engagement: An emerging concept in occupational health psychology. *Work & Stress*, 22, 187–200.
- Ball, S. (2003). The teacher's soul and the terrors of performativity. *Journal of Education Policy*, 18, 215–228.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84, 191–215.
- Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist*, 37, 122–147.

- Bandura, A. (1993). Perceived self-efficacy in cognitive development and functioning. *Educational Psychologist, 28*, 117–148.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York, NY: W.H. Freeman.
- Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology, 52*, 1–26.
- Bang, H., & Montgomery, D. (2010). Exploring Korean and American teachers' preferred emotional types. *Roeper Review, 32*, 176–188.
- Banzhaf, W. (2009). Self-organizing systems. In R. Meyers (Ed.), *Encyclopedia of complexity and systems science* (pp. 8040–8050). New York, NY: Springer.
- Barkhuizen, G. (2014). Narrative research in language teaching and learning. *Language Teaching, 47*, 450–466.
- Barkhuizen, G., Benson, P., & Chik, A. (2014). *Narrative inquiry in language teaching and learning research*. New York, NY: Routledge.
- Bauer, J., McAdams, D., & Pals, J. (2008). Narrative identity and eudaimonic well-being. *Journal of Happiness Studies, 9*, 81–104.
- Bazeley, P., & Jackson, K. (2013). *Qualitative data analysis with NVivo* (2nd ed.). London, England: SAGE.
- Beach, D., & Pedersen, R. B. (2013). *Process tracing methods: Foundations and guidelines*. Ann Arbor, MI: University of Michigan Press.
- Beauchamp, C., & Thomas, L. (2009). Understanding teacher identity: An overview of issues in the literature and implications for teacher education. *Cambridge Journal of Education, 39*, 175–189.

- Beauchamp, C., & Thomas, L. (2011). New teachers' identity shifts at the boundary of teacher education and initial practice. *International Journal of Educational Research*, *50*, 6–15.
- Becker, E. S., Goetz, T., Morger, V., & Ranellucci, J. (2014). The importance of teachers' emotions and instructional behavior for their students' emotions—An experience sampling analysis. *Teaching and Teacher Education*, *43*, 15–26.
- Becker, E. S., Keller, M., Goetz, T., Frenzel, A., & Taxer, J. L. (2015). Antecedents of teachers' emotions in the classroom: An intraindividual approach. *Frontiers in Psychology*, *6*(635), 1–12. doi: 10.3389/fpsyg.2015.00635
- Beijaard, D., Meijer, P. C., & Verloop, N. (2004). Reconsidering research on teachers' professional identity. *Teaching and Teacher Education*, *20*, 107–128.
- Beijaard, D., Verloop, N., & Vermunt, J. D. (2000). Teachers' perceptions of professional identity: An exploratory study from a personal knowledge perspective. *Teaching and Teacher Education*, *16*, 749–764.
- Beltman, S., Mansfield, C., & Price, A. (2011). Thriving not just surviving: A review of research on teacher resilience. *Educational Research Review*, *6*, 185–207.
- Benesch, S. (2012). *Considering emotions in critical English language teaching*. New York, NY: Routledge.
- Bennett, A., & Checkel, J. (2015). *Process tracing: From metaphor to analytic tool*. Cambridge, England: Cambridge University Press.
- Berzonsky, M. (2011). A social-cognitive perspective on identity construction. In S.J. Schwartz, K. Luyckx, & V.L. Vignoles (Eds.), *Handbook of identity theory and research* (pp. 55–76). New York, NY: Springer.

- Blanchard, C. D., Hebert, M., & Blanchard, R. (2000). Defensive behaviors. In G. Fink (Ed.), *Encyclopedia of stress* (pp. 652–656). San Diego: Academic Press.
- Blommaert, J. (2014). From mobility to complexity in sociolinguistic theory and method. *Tilburg Papers in Culture Studies, 103*. Tilburg, The Netherlands: Tilburg University.
- Bloor, M., Frankland, J., Thomas, M., & Robson, K. (2001). *Focus groups in social research*. Thousand Oaks, CA: SAGE.
- Bobeck, B. (2002). Teacher resiliency: A key to career longevity. *The Clearing House, 75*, 202–205.
- Bodin, Ö., & Crona, B. (2009). The role of social networks in natural resource governance: What relational patterns make a difference? *Global Environmental Change, 19*, 366–374.
- Boekaerts, M. (2007). Understanding students' affective processes in the classroom. In P. Schutz & R. Pekrun (Eds.), *Emotions in education* (pp. 37–56). San Diego, CA: Academic Press.
- Bonanno, G. (2004). Loss, trauma, and human resilience: Have we underestimated the human capacity to thrive after extremely aversive events? *American Psychologist, 59*, 20–28.
- Bono, J., & Vey, M. (2005). Toward understanding emotional management at work: A quantitative review of emotional labor research. In C. Härtel, W. Zerbe, & N. Ashkanasy (Eds.), *Emotions in organizational behavior* (pp. 213–233). Mahwah, NJ: Lawrence Erlbaum.
- Borg, M., & Riding, R. (1991). Occupational stress and satisfaction in teaching. *British Educational Research Journal, 17*, 263–281.

- Borg, S. (2015). *Teacher cognition and language education: Research and practice*. London, England: Bloomsbury.
- Boschetti, F., Hardy, P. Y., Grigg, N., & Horowitz, P. (2011). Can we learn how complex systems work? *Emergence: Complexity & Organization*, 13(4), 47–62.
- Britzman, D. (2003). *Practice makes practice: A critical study of learning to teach*. Albany, NY: State University of New York Press.
- Brouwers, A., & Tomic, W. (2000). A longitudinal study of teacher burnout and perceived self-efficacy in classroom management. *Teaching and Teacher Education*, 16, 239–253.
- Bruner, J. S. (1986). *Actual minds, possible worlds*. Cambridge, MA: Harvard University Press.
- Brunetti, G. (2006). Resilience under fire: Perspectives on the work of experienced, inner city high school teachers in the United States. *Teaching and Teacher Education*, 22, 812–825.
- Bryant, A., & Charmaz, K. (Eds.). (2007). *The SAGE handbook of grounded theory*. Thousand Oaks, CA: SAGE.
- Bukor, E. (2015). Exploring teacher identity from a holistic perspective: reconstructing and reconnecting personal and professional selves. *Teachers and Teaching*, 21, 305–327.
- Bullough, R. (2005). Teacher vulnerability and teachability: A case study of a mentor and two interns. *Teacher Education Quarterly*, 32(2), 23–40.
- Bullough, R. (2011). Hope, happiness, teaching, and learning. In C. Day & J.C.–K. Lee (Eds.), *New understandings of teacher's work: Emotions and educational change* (pp. 15–30). New York, NY: Springer.

- Bullough, R., Bullough, D., & Mayes, P. (2006). Getting in touch: dreaming, the emotions and the work of teaching. *Teachers and Teaching: Theory and Practice*, 12, 193–208.
- Bullough, R., & Hall–Kenyon, K. (2011). The call to teach and teacher hopefulness. *Teacher Development*, 15, 127–140.
- Burkitt, I. (2011). Identity construction in sociohistorical context. In S.J. Schwartz, K. Luyckx, & V.L. Vignoles (Eds.), *Handbook of identity theory and research* (pp. 267–284). New York, NY: Springer.
- Burns, A., Freeman, D., & Edwards, E. (2015). Theorizing and studying the language-teaching mind: Mapping research on language teacher cognition. *Modern Language Journal*, 99, 585–601.
- Butler, R. (2007). Teachers' achievement goal orientations and associations with teachers' help seeking: Examination of a novel approach to teacher motivation. *Journal of Educational Psychology*, 99, 241–252.
- Butler, R. (2012). Striving to connect: Extending an achievement goal approach to teacher motivation to include relational goals for teaching. *Journal of Educational Psychology*, 104, 726–742.
- Butler, R., & Shibaz, L. (2008). Achievement goals for teaching as predictors of students' perceptions of instructional practices and students' help seeking and cheating. *Learning and Instruction*, 18, 453–467.
- Butler, Y. (2015). English language education among young learners in East Asia: A review of current research (2004–2014). *Language Teaching*, 48, 303–342.
- Byrne, D. (1998). *Complexity theory and the social sciences: An introduction*. New York, NY: Routledge.

- Byrne, D. (2002). *Interpreting quantitative data*. Thousand Oaks, CA: SAGE.
- Byrne, D. (2005). Complexity, configurations and cases. *Theory, Culture and Society*, 22(5), 95–111.
- Byrne, D. (2009a). Case-based methods: Why we need them; What they are; How to do them. In D. Byrne & C.C. Ragin (Eds.), *The SAGE handbook of case-based methods* (pp. 1–13). Thousand Oaks, CA: SAGE.
- Byrne, D. (2009b). Complex realists and configurational approaches to cases: A radical synthesis. In D. Byrne & C.C. Ragin (Eds.), *The SAGE handbook of case-based methods* (pp. 101–112). Thousand Oaks, CA: SAGE.
- Byrne, D. (2010). Comparison, diversity and complexity. In P. Cilliers & R. Preiser (Eds.), *Complexity, difference, and identity* (pp. 61–75). Dordrecht, The Netherlands: Springer.
- Byrne, D. (2011). *Applying social science*. Bristol, England: Policy Press.
- Byrne, D., & Callaghan, G. (2014). *Complexity theory and the social sciences: The state of the art*. New York, NY: Routledge.
- Byrne, D., & Ragin, C. (Eds.) (2009). *The SAGE handbook of case-based methods*. Thousand Oaks, CA: SAGE.
- Cacioppo, J., Reis, H., & Zautra, A. (2011). Social resilience: The value of social fitness with an application to the military. *American Psychologist*, 66, 43–51.
- Canrinus, E., Helms–Lorenz, M., Beijaard, D., Buitink, J., & Hofman, A. (2012). Self-efficacy, job satisfaction, motivation and commitment: exploring the relationships between indicators of teachers’ professional identity. *European Journal of Educational Psychology*, 27, 115–132.

- Carolan, B. (2014). *Social network analysis and education: Theory, methods and applications*. Thousand Oaks, CA: SAGE.
- Carter, K. (1993). The place of story in the study of teaching and teacher education. *Educational Researcher*, 22, 5–18.
- Carver, C. (1989). How should multifaceted personality constructs be tested? Issues illustrated by self-monitoring, attributional style, and hardiness. *Journal of Personality and Social Psychology*, 56, 577–585.
- Carver, C., & Scheier, M. (1998). *On the self-regulation of behavior*. New York, NY: Cambridge University Press.
- Carver, C., Scheier, M., & Weintraub, J. (1989). Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology*, 56, 267–283.
- Castellani, B., & Hafferty, F. (2009). *Sociology and complexity science: A new field of inquiry*. Berlin, Germany: Springer.
- Castro, A., Kelly, J., & Shih, M. (2010). Resilience strategies for new teachers in high-needs areas. *Teaching and Teacher Education*, 26, 622–629.
- Chan, D. (2003). Hardiness and its role in the stress–burnout relationship among prospective Chinese teachers in Hong Kong. *Teaching and Teacher Education*, 19, 381–395.
- Chan, L. (2014). *Possible selves, vision, and dynamic systems theory in second language learning and teaching* (Unpublished doctoral dissertation). University of Nottingham, England.
- Chang, M.–L., & Davis, H. (2009). Understanding the role of teacher appraisals in shaping the dynamics of their relationships with students: Deconstructing

- teachers' judgments of disruptive behavior/students. In P. Schutz & M. Zembylas (Eds.), *Advances in teacher emotion research: The impact on teachers' lives* (pp. 95–128). Dordrecht, The Netherlands: Springer.
- Charmaz, K. (2014). *Constructing grounded theory* (2nd ed.). Thousand Oaks, CA: SAGE.
- Charney, D. (2004). Psychobiological mechanisms of resilience and vulnerability: Implications for successful adaptation to extreme stress. *The American Journal of Psychology, 161*, 195–216.
- Chen, J. (2016). Understanding teacher emotions: The development of a teacher emotion inventory. *Teaching and Teacher Education, 55*, 66–77.
- Chen, S., Boucher, H., & Kraus, M. (2011). The relational self. In S.J. Schwartz, K. Luyckx, & V.L. Vignoles (Eds.), *Handbook of identity theory and research* (pp. 149–175). New York, NY: Springer.
- Cheng, H.-F., & Dörnyei, Z. (2007). The use of motivational strategies in language instruction: The case of EFL teaching in Taiwan. *Innovation in Language Learning and Teaching, 1*, 153–174.
- Chiang, M., & Mirkin, B. (2010). Intelligent choice of the number of clusters in K-Means clustering: An experimental study with different cluster spreads. *Journal of Classification, 27*, 3–40.
- Chiappelli, F., & Hodgson, D. (2000). Immune suppression. In G. Fink (Ed.), *Encyclopedia of stress* (pp. 531–535). San Diego, CA: Academic Press.
- Chiappelli, F., & Liu, Q. N. (2000). Immunity. In G. Fink (Ed.), *Encyclopedia of stress* (pp. 541–546). San Diego, CA: Academic Press.

- Chicchetti, D. (1984). The emergence of developmental psychopathology. *Child Development, 55*, 1–7.
- Chicchetti, D. (2010). Resilience under conditions of extreme stress: A multilevel perspective. *World Psychiatry, 9*, 145–154.
- Chicchetti, D., & Garmezy, N. (1993). Prospects and promises in the study of resilience. *Development and Psychopathology, 5*, 497–502.
- Chicchetti, D., & Rogosch, F. (1997). The role of self-organization in the promotion of resilience in maltreated children. *Development and Psychopathology, 9*, 797–815.
- Chingos, M. M., & Peterson, P. (2011). It's easier to pick a good teacher than to train one: Familiar and new results on the correlates of teacher effectiveness. *Economics of Education Review, 30*, 449–465.
- Chirkov, V. (2009). A cross-cultural analysis of autonomy in education: A self-determination theory perspective. *Theory and Research in Education, 7*, 253–262.
- Cilliers, P. (2000). Knowledge, complexity, and understanding. *Emergence, 2*(4), 7–13.
- Cilliers, P. (2005). Complexity, deconstruction and relativism. *Theory, Culture and Society, 22*, 255–267.
- Clarke, M. (2008). *Language teacher identities: Co-constructing discourse and community*. Bristol, England: Multilingual Matters.
- Clore, G., & Ortony, A. (2008). Appraisal theories: How cognition shapes affect into emotion. In M. Lewis, J. Haviland–Jones, & L. Barrett (Eds.), *Handbook of emotions* (3rd ed.) (pp. 628–642). New York, NY: Guilford.
- Cole, A. (1997). Impediments to reflective practice. *Teachers and Teaching: Theory and Practice, 3*, 7–27.

- Collie, R., Shapka, J., & Perry, N. (2012). School climate and social–emotional learning: Predicting teacher stress, job satisfaction, and teaching efficacy. *Journal of Educational Psychology, 104*, 1189–1204.
- Connell, R. (2009). Good teachers on dangerous ground: Towards a new view of teacher quality and professionalism. *Critical Studies in Education, 50*, 213–229.
- Connelly, F. M., & Clandinin, D. J. (1990). Stories of experience and narrative inquiry. *Educational Researcher, 19*(5), 2–13.
- Connelly, F. M., & Clandinin, D. J. (1999). *Shaping a professional identity: Stories of educational practice*. New York, NY: Teachers College Press.
- Connor, K., & Davidson, J. (2003). Development of a new resilience scale: The Connor-Davidson Resilience Scale. *Depression and Anxiety, 18*, 76–82.
- Coolahan, J., Santiago, P., Phair, R., & Ninomiya, A. (2004). *Attracting, developing and retaining effective teachers: Korea*. Organization for Economic Co-operation and Development, Directorate for Education and Training Policy Division. Retrieved from <http://www.oecd.org/korea/31690991.pdf>
- Cooper, M., & Alder, M. (2006). The evolution of adaptive immune systems, *Cell, 124*, 815–822.
- Corbin, J., & Strauss, A. (1990). Grounded theory research: Procedures, canons, and evaluative criteria. *Qualitative Sociology, 13*, 3–21.
- Corbin, J., & Strauss, A. (2015). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (4th ed.). Thousand Oaks, CA: SAGE.
- Costa, P., & McCrae, R. (1985). Hypochondriasis, neuroticism, and aging: When are somatic complaints unfounded? *American Psychologist, 40*, 19–28.

- Costa, P., & McCrae, R. (1987). Neuroticism, somatic complaints, and disease: Is the bark worse than the bite? *Journal of Personality*, *55*, 299–316.
- Costa, P., & McCrae, R. (1992). Revised NEO Personality Inventory (NEO-PI-R) and NEO Five-Factor Inventory (NEO-FFI) professional manual. Odessa, FL: Psychological Assessment Resources.
- Cowie, N. (2011). Emotions that experienced English as a Foreign Language (EFL) teachers feel about their students, their colleagues and their work. *Teaching and Teacher Education*, *27*, 235–242.
- Cross, D., & Hong, J. Y. (2009). Beliefs and professional identity: Critical constructs in examining the impact of reform on the emotional experiences of teachers. In P. Schutz & M. Zembylas (Eds.), *Advances in teacher emotion research: The impact on teachers' lives* (pp. 273–296). Dordrecht, The Netherlands: Springer.
- Csikszentmihalyi, M., & LeFevre, J. (1989). Optimal experience in work and leisure. *Journal of Personality and Social Psychology*, *56*, 815–822.
- Danielewicz, J. (2001). *Teaching selves: Identity, pedagogy, and teacher education*. Albany, NY: State University of New York Press.
- Darby, A. (2008). Teachers' emotions in the reconstruction of professional self-understanding. *Teaching and Teacher Education*, *24*, 1160–1172.
- Datnow, A. (2012). Teacher agency in educational reform: Lessons from social networks research. *American Journal of Education*, *119*, 193–201.
- Davies, M., & Underwood, G. (2000). Cognition and stress. In G. Fink (Ed.), *Encyclopedia of stress* (pp. 478–483). San Diego, CA: Academic Press.
- Davis, B., & Sumara, D. (2006). *Complexity and education: Inquiries into learning, teaching and research*. Mahwah, NJ: Lawrence Earlbaum.

- Day, C. (2004). *A passion for teaching*. New York, NY: Routledge.
- Day, C. (2008). Committed for life? Variations in teachers' work, lives and effectiveness. *Journal of Educational Change*, 9, 243–260.
- Day, C. (2011). Uncertain professional identities: Managing the emotional contexts of teaching. In C. Day & J.C.–K. Lee (Eds.), *New understandings of teacher's work: Emotions and educational change* (pp. 45–64). New York, NY: Springer.
- Day, C., & Gu, Q. (2014). *Resilient teachers, resilient schools: Building and sustaining quality in testing times*. New York, NY: Routledge.
- Day, C., & Lee, J. C.–K. (Eds.). (2011). *New understandings of teacher's work: Emotions and educational change*. New York, NY: Springer.
- Day, C., & Qing, G. (2009). Teacher emotions: Well being and effectiveness. In P. Schutz & M. Zembylas (Eds.), *Advances in teacher emotion research: The impact on teachers' lives* (pp. 15–32). Dordrecht, The Netherlands: Springer.
- Day, C., Kington, A., Stobart, G., & Sammons, P. (2006). The personal and professional selves of teachers: Stable and unstable identities. *British Educational Research Journal*, 32, 601–616.
- Day, C., Sammons, P., Stobart, G., Kington, A., & Gu, Q. (2007). *Teachers matter: Connecting lives, work and effectiveness*. New York, NY: McGraw-Hill.
- de Bot, K. (2012). Rethinking multilingual processing: From a static to dynamic approach. In J.C. Amaro, S. Flynn, & J. Rothman (Eds.), *Third Language Acquisition in Adulthood* (pp. 70–94). Amsterdam: John Benjamins.
- de Bot, K. (2015). Rates of change: Time scales in second language development. In Z. Dörnyei, P.D. MacIntyre, & A. Henry (Eds.), *Motivational dynamics in language learning* (pp. 29–37). Bristol, England: Multilingual Matters.

- de Bot, K., & Larsen–Freeman, D. (2011). Researching second language development from a dynamic systems theory perspective. In M. Verspoor, K. de Bot, & W. Lowie (Eds.), *A dynamic approach to second language development* (pp. 5–23). Amsterdam: John Benjamins.
- De Villiers–Botha, T., & Cilliers, P. (2010). The complex “I”: The formation of identity in complex systems. In P. Cilliers & R. Preiser (Eds.), *Complexity, difference, and identity* (pp. 19–38). Dordrecht, The Netherlands: Springer.
- De Wolf, T., & Holvoet, T. (2005). Emergence versus self-organisation: Different concepts but promising when combined. In S. Brueckner, G. Di Marzo Serugendo, A. Karageorgos, & R. Nagpal (Eds.), *Engineering self-organising systems: Methodologies and applications* (pp. 1–15). Berlin, Germany: Springer.
- Deci, E., & Ryan, R. (2000). The ‘what’ and ‘why’ of goal pursuits: Human needs and the self determination of behavior. *Psychological Inquiry*, *11*, 227–268.
- Deci, E., & Ryan, R. (2002). Overview of self-determination theory: An organismic dialectical perspective. In E. Deci & R. Ryan (Eds.), *Handbook of self-determination research* (pp. 3–33). Rochester, NY: University of Rochester Press.
- Dekker, S., Cilliers, P., & Hofmeyr, J. H. (2011). The complexity of failure: implications of complexity theory for safety investigations. *Safety Science*, *49*, 939–945.
- DeLongis, A., & Preece, M. (2000). Coping skills. In G. Fink (Ed.), *Encyclopedia of stress* (pp. 532–540). San Diego, CA: Academic Press.
- Demerouti, E., Bakker, A., Nachreiner, F., & Schaufeli, W. (2001). The Job Demands-Resources model of burnout. *Journal of Applied Psychology*, *86*, 499–512.
- Den Brok, P., van der Want, A., Beijsaard, D., & Wubbels, T. (2013). The interpersonal dimension in the classroom: A model of teachers’ interpersonal role identity,

- appraisal and teacher–student relationships. *Advances in Research on Teaching*, 18, 141–159.
- Denson, T., Spanovic, M., & Miller, N. (2009). Cognitive appraisals and emotions predict cortisol and immune responses: A meta-analysis of acute laboratory social stressors and emotion inductions. *Psychological Bulletin*, 135, 823–853.
- Dewaele, J.–M. (2010). *Emotions in multiple languages*. Basingstoke, England, Palgrave Macmillan.
- Dolbier, C., Cocks, R., Leiferman, J., Steinhardt, M., Schapiro, S., Nehete, P., Perlman, J., & Sastry, J. (2001). Differences in functional immune responses of high vs. low hardy healthy individuals. *Journal of Behavioral Medicine*, 24, 219–229.
- Dolnicar, S. (2002). *A review of unquestioned standards in using cluster analysis for data-driven market segmentation*. Proceedings of ANZMAC 2002. Melbourne: Deakin University.
- Dooley, K. (1997). A complex adaptive systems model of organization change. *Nonlinear Dynamics, Psychology, and Life Sciences*, 1, 69–97.
- Dörnyei, Z. (2001). *Motivational strategies in the language classroom*. Cambridge, England: Cambridge University Press.
- Dörnyei, Z. (2014). Researching complex dynamic systems: ‘Retrodictive qualitative modelling’ in the language classroom. *Language Teaching*, 47, 80–91.
- Dörnyei, Z., & Kubanyiova, M. (2014). *Motivating learners, motivating teachers: Building vision in the language classroom*. Cambridge, England: Cambridge University Press.
- Dörnyei, Z., MacIntyre, P. D., & Henry, A. (Eds.). (2015). *Motivational dynamics in language learning*. Bristol, England: Multilingual Matters.

- Dörnyei, Z., & Malderez, A. (1997). Group dynamics and foreign language teaching. *System*, 25, 65–81.
- Dörnyei, Z., & Murphey, T. (2003). *Group dynamics in the language classroom*. Cambridge, England: Cambridge University Press.
- Dörnyei, Z., & Ryan, S. (2015). *The psychology of the language learner revisited*. New York, NY: Routledge.
- Dörnyei, Z., & Ushioda, E. (2011). *Teaching and researching motivation* (2nd ed.). New York, NY: Routledge.
- Duff, P. (2008). *Case study research in applied linguistics*. Mahwah, NJ: Lawrence Erlbaum.
- Dweck, C. (2006). *Mindset: The new psychology of success*. New York, NY: Random House.
- Dweck, C., & Leggett, E. (1988). A social-cognitive approach to motivation and personality. *Psychological Review*, 95, 256–273.
- Edwards J., Cambridge, G., & Abrahams, V. (1999). Do self-perpetuating B lymphocytes drive human autoimmune disease? *Immunology*, 97, 1868–1876.
- Egeland, B., Carlson, E., & Sroufe, L. A. (1993). Resilience as process. *Development and Psychopathology*, 5, 517–528.
- Ehrman, M., & Dörnyei, Z. (1998). *Interpersonal dynamics in second language education: The visible and invisible classroom*. Thousand Oaks, CA: SAGE.
- Ellis, N. C. (1998). Emergentism, connectionism and language learning. *Language Learning*, 48, 631–664.

- Ellis, N. C., & Larsen–Freeman, D. (2006). Language emergence: Implications for applied linguistics. Introduction to the special issue. *Applied Linguistics*, 27, 558–589.
- Ellis, R. (2012). *Language teaching research and language pedagogy*. Chichester, England: Wiley-Blackwell.
- Eoyang, G. (2003). *Conditions for self-organizing in human systems* (Unpublished doctoral dissertation). The Union Institute and University, Ohio.
- Eoyang, G. (2004). The practitioner's landscape. *Emergence: Complexity & Organization*, 6(1/2), 55–60.
- Esquivel, G., Doll, B., & Oades–Sese, G. (2011). Introduction to the special issue: Resilience in schools. *Psychology in the Schools*, 48, 649–651.
- Evans, L. (1997). Understanding teacher morale and job satisfaction. *Teacher Development*, 13, 831–845.
- Eve, R., Horsfall, S., & Lee, M. (Eds.). (1997). *Chaos, complexity, and sociology: Myths, models, and theories*. Thousand Oaks, CA: SAGE.
- Everitt, B., Landau, S., Leese, M., & Stahl, D. (2011). *Cluster analysis* (5th ed.). Chichester, England: John-Wiley.
- Farnsworth, V. (2010). Conceptualizing identity, learning and social justice in community based learning. *Teaching and Teacher Education*, 26, 1481–1489.
- Farrell, T. S. C. (2015). *Promoting teacher reflection in second language education: A framework for TESOL professionals*. New York, NY: Routledge.
- Federici, R., & Skaalvik, E. (2011). Principal self-efficacy: Relations with burnout, job satisfaction and motivation to quit. *Social Psychology of Education*, 15, 575–600.

- Felton, D., & Maida, M. (2000). Neuroimmunomodulation. In G. Fink (Ed.), *Encyclopedia of stress* (pp. 37–48). San Diego, CA: Academic Press.
- Fernet, C., Guay, F., Senécal, C., & Austin, S. (2012). Predicting intraindividual changes in teacher burnout: The role of perceived school environment and motivational factors. *Teaching and Teacher Education, 28*, 514–525.
- Fimian, M. (1984). The development of an instrument to measure occupational stress in teachers: The teacher stress inventory. *Journal of Occupational Psychology, 57*, 277–293.
- Fimian, M. (1988). *Teacher stress inventory*. Brandon, VT: Clinical Psychology Publishing.
- Finlay, B., & McFadden, G. (2006). Anti-immunology: Evasion of the host immune system by bacterial and viral pathogens. *Cell, 124*, 767–782.
- Firestone, W. (2014). Teacher evaluation policy and conflicting theories of motivation. *Educational Researcher, 43*, 100–107.
- Fischer, A., & Manstead, A. (2008). Social functions of emotion. In M. Lewis, J. Haviland–Jones, & L. Barrett (Eds.), *Handbook of emotions* (3rd ed.) (pp. 456–468). New York, NY: Guilford.
- Flick, U. (Ed.). (2014). *The SAGE handbook of qualitative data analysis*. Thousand Oaks, CA: SAGE.
- Flores, M. A., & Day, C. (2006). Contexts which shape and reshape new teachers' identities: A multi-perspective study. *Teaching and Teacher Education, 22*, 219–232.

- Folds, J. D. (2008). An overview of immunity. In M. O’Gorman & A. Donnenberg (Eds.), *Handbook of human immunology* (2nd ed.) (pp. 1–28). Boca Raton, FL: CRC Press.
- Fredrickson, B. L. (1998). What good are positive emotions? *Review of General Psychology*, 2, 300–319.
- Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *American Psychologist*, 56, 218–226.
- Frenzel, A. (2014). Teacher emotions. In E. Linnenbrink–Garcia & R. Pekrun (Eds.), *International handbook of emotions in education* (pp. 494–519). New York, NY: Routledge.
- Frenzel, A., Becker–Kurz, B., Pekrun, R., & Goetz, T. (2015). Teaching this class drives me nuts!—Examining the person and context specificity of teacher emotions. *Plos ONE*, 10(6), 1–15. doi:10.1371/journal.pone.0129630
- Frenzel, A., Goetz, T., Lüdtke, O., Pekrun, R., Sutton, R. (2009). Emotional transmission in the classroom: Exploring the relationship between teacher and student enjoyment. *Journal of Educational Psychology*, 101, 705–716
- Friesen, D., & Sarros, J. (1989). Sources of burnout among educators. *Journal of Organizational Behavior*, 10, 179–188.
- Funk, S. (1992). Hardiness: A review of theory and research. *Health Psychology*, 11, 335–345.
- Funk, S., & Houston, B. K. (1987). A critical analysis of the hardiness scale’s validity and utility. *Journal of Personality and Social Psychology*, 53, 572–578.

- Gagné, M., Forest, J., Gilbert, M.–H., Aubé, C., Morin, E., & Malorni, A. (2008). *Proceedings of the Annual Conference of the Administrative Sciences Association of Canada, Organizational Behaviour*, 29(5), 157–176.
- Galton, M., & MacBeath, J. (2008). *Teachers under pressure*. Thousand Oaks, CA: SAGE.
- Ganellen, R., & Blaney, P. (1984). Hardiness and social support as moderators of the effects of life stress. *Journal of Personality and Social Psychology*, 47, 156–163.
- Gao, F. (2012). Teacher identity, teaching vision, and Chinese language education for South Asian students in Hong Kong. *Teachers and Teaching*, 18, 89–99.
- Gao, X., & Xu, H. (2014). The dilemma of being English language teachers: Interpreting teachers' motivation to teach, and professional commitment in China's hinterland regions. *Language Teaching Research*, 18, 152–168.
- Garnezy, N. (1971). Vulnerability research and the issue of primary prevention. *American Journal of Orthopsychiatry*, 41, 101–116.
- Garnezy, N., Masten, A., & Tellegen, A. (1984). The study of stress and competence in children: A building block for developmental psychopathology. *Child Development*, 55, 97–111.
- Garner, P. (2010). Emotional competence and its influences on teaching and learning. *Educational Psychology Review*, 22, 297–321.
- Geijsel, F., & Meijers, F. (2005). Identity learning: The core process of educational change. *Educational Studies*, 31, 419–430.
- Gell–Mann, M. (1994). Complex adaptive systems. In G. Cowan, D. Pines & D. Meltzer (Eds.), *Complexity: Metaphors, models and reality* (pp. 17–45). Reading, MA: Addison-Wesley.

- Gershenson, C. (2007). *Design and control of self-organizing systems*. Publisher: Author.
- Geving, A. (2007). Identifying the types of student and teacher behaviors associated with teacher stress. *Teaching and Teacher Education*, 23, 624–640.
- Giclas, P. (2008). The complement system. In M. O’Gorman & A. Donnenberg (Eds.), *Handbook of human immunology* (2nd ed.) (pp. 107–136). Boca Raton, FL: CRC Press.
- Gleick, J. (2008). *Chaos: Making a new science*. New York, NY: Penguin Books.
- Goetz, T., Becker, E. S., Bieg, M., Keller, M., Frenzel, A., & Hall, N. C. (2015). The glass half empty: How emotional exhaustion affects the state-trait discrepancy in self-reports of teaching emotions. *Plos ONE*, 10(9), 1–14.
doi:10.1371/journal.pone.0137441
- Gold, Y., & Roth, R. (2005). *Teachers managing stress and preventing burnout*. London, England: The Falmer Press.
- Goldstein, D. (1995). Stress as a scientific idea: Homeostatic theory of stress and distress. *Homeostasis*, 36, 117–215.
- Goldstein, D., & McEwen, B. (2002). Allostasis, homeostats, and the nature of stress. *Stress*, 5, 55–58.
- Goldstein, J. (2011). Probing the nature of complex systems: Parameters, modeling, interventions. *Emergence: Complexity & Organization*, 13, 94–121.
- Golombek, P. (1998). A study of language teachers’ personal practical knowledge. *TESOL Quarterly*, 32, 447–464.
- Golombek, P., & Doran, P. (2014). Unifying cognition, emotion, and activity in language teacher professional development. *Teaching and Teacher Education*, 39, 102–111.

- Golombek, P., & Johnson, K. E. (2004). Narrative inquiry as a meditational space: Examining emotional and cognitive dissonance in second language teachers' development. *Teachers and Teaching: Theory and Practice, 10*, 307–327.
- Gorochofski, T., di Bernardo, M., & Grierson, C. (2011). Evolving dynamical networks: A formalism for describing complex systems. *Complexity, 17*(4), 18–25.
- Greenglass, E. (2000). Teaching and stress. In G. Fink (Ed.), *Encyclopedia of stress* (pp. 571–574). San Diego, CA: Academic Press.
- Gregersen, T., MacIntyre, P. D., & Meza, M. (2014). The motion of emotion: Idiodynamic case studies of learners' foreign language anxiety. *Modern Language Journal, 98*, 574–588.
- Gregg, G. (2006). The raw and the bland: A structural model of narrative identity. In D.P. McAdams, R. Josselson, & A. Lieblich (Eds.), *Identity and story: Creating self in narrative* (pp. 89–108). Washington, DC: APA Press.
- Gregoire, M. (2003). Is it a challenge or a threat? A dual process model of teachers' cognition and appraisal processes during conceptual change. *Educational Psychology Review, 15*, 147–179.
- Griffin, J., Steptoe, A., & Cropley, M. (1999). An investigation of coping strategies associated with job stress in teachers. *British Journal of Educational Psychology, 69*, 517–531.
- Groff, R. (Ed.). (2008). *Revitalizing causality: Realism about causality in philosophy and social science*. New York, NY: Routledge.
- Gross, J. J. (1998). The emerging field of emotion regulation: An integrative review. *Review of General Psychology, 2*, 271–299.

- Gross, J. J. (2008). Emotion regulation. In M. Lewis, J. Haviland–Jones, & L. Barrett (Eds.), *Handbook of emotions* (3rd ed.) (pp. 497–512). New York, NY: Guilford.
- Gross, J. J., & Thompson, R. (2007). Emotion regulation: Conceptual foundations. In J. Gross (Ed), *Handbook of emotion regulation* (pp. 3–24). New York, NY: Guilford.
- Gu, M. M., & Benson, P. (2015). The formation of English teacher identities: A cross-cultural investigation. *Language Teaching Research*, *19*, 187–206.
- Gu, Q., & Day, C. (2007). Teachers resilience: A necessary condition for effectiveness. *Teaching and Teacher Education*, *23*, 1302–1316.
- Gubrium, J., Holstein, J., Marvasti, A., & McKinney, K. (Eds.). (2012). *Handbook of interview research: Context and methods* (2nd ed.). Thousand Oaks, CA: SAGE.
- Guilloteaux, M.–J. (2013). Motivational strategies for the language classroom: perceptions of Korean secondary school English teachers. *System*, *41*, 3–14.
- Guilloteaux, M.–J., & Dörnyei, Z. (2008). Motivating language learners: A classroom-oriented investigation of the effects of motivational strategies on student motivation. *TESOL Quarterly*, *42*, 55–77.
- Hakanen, J., Bakker, A., & Schaufeli, W. (2006). Burnout and work engagement among teachers. *Journal of School Psychology*, *43*, 495–513.
- Haken, H. (1985). Synergetics – an interdisciplinary approach to phenomena of self-organization. *Geoforum*, *16*, 205–211.
- Haken, H. (1997). Visions of synergetics. *Journal of the Franklin Institute*, *334B*(5/6), 759–792.
- Haken, H. (2006). *Information and self-organization: A macroscopic approach to complex systems* (3rd ed.). Berlin, Germany: Springer.

- Haken, H. (2009). Synergetics: Basic concepts. In R. Meyers (Ed.), *Encyclopedia of complexity and systems science* (pp. 8926–8946). New York, NY: Springer.
- Haken, H., Wunderlin, A., & Yigitbasi, S. (1995). An introduction to synergetics. *Open Systems and Information Dynamics*, 3, 97–130.
- Halkidi, M., Batistakis, Y., Vazirgiannis, M. (2001). On clustering validation techniques. *Journal of Intelligent Information Systems*, 17, 107–145.
- Hamel, G., & Valikangas, L. (2003). The quest for resilience. *Harvard Business Review*, 81(9), 52–65.
- Hamman, D., Gosselin, K., Romano, J., & Bunuan, R. (2010). Using possible-selves theory to understand the identity development of new teachers. *Teaching and Teacher Education*, 26, 1349–1361.
- Hanushek, E., Rivkin, S. (2010). Generalizations about using value-added measures of teacher quality. *The American Economic Review*, 100, 267–271.
- Hargreaves, A. (1998). The emotional practice of teaching. *Teaching and Teacher Education*, 14, 835–854.
- Hargreaves, A. (2000). Mixed emotions: teachers' perceptions of their interactions with students. *Teaching and Teacher Education*, 16, 811–826.
- Hargreaves, A. (2001). Emotional geographies of teaching. *Teachers College Record*, 103, 1056–1080.
- Harter, S. (1999). *The construction of the self: A developmental perspective*. New York, NY: Guilford.
- Harvey, D. (2009). Complexity and case. In D. Byrne & C.C. Ragin (Eds.), *The SAGE handbook of case-based methods* (pp. 15–38). Thousand Oaks, CA: SAGE.

- Helsing, D. (2007). Regarding uncertainty in teachers and teaching. *Teaching and Teacher Education*, 23, 1317–1333.
- Henry, A. (2015). The dynamics of possible selves. In Z. Dörnyei, P.D. MacIntyre, & A. Henry (Eds.), *Motivational dynamics in language learning* (pp. 83–94). Bristol, England: Multilingual Matters.
- Hermans, H. J. M. (1996). Voicing the self: From information processing to dialogical interchange. *Psychological Bulletin*, 119, 31–50.
- Hiver, P. (2013). The interplay of possible language teacher selves in professional development choices. *Language Teaching Research*, 17, 210–227.
- Hiver, P. (2015a). Attractor states. In Z. Dörnyei, P.D. MacIntyre & A. Henry (Eds.), *Motivational dynamics in language learning* (pp. 20–28). Bristol, England: Multilingual Matters.
- Hiver, P. (2015b). Once burned, twice shy: The dynamic development of system immunity in language teachers. In Z. Dörnyei, P.D. MacIntyre & A. Henry (Eds.), *Motivational dynamics in language learning* (pp. 214–237). Bristol, England: Multilingual Matters.
- Hiver, P., & Al-Hoorie, A. (2016). A dynamic ensemble for second language research: Putting complexity theory into practice. *Modern Language Journal*, 100(4), xx–xx.
- Hiver, P., & Dörnyei, Z. (in press). Language teacher immunity: A double-edged sword. Advance Online Access. *Applied Linguistics*. doi:10.1093/applin/amv034
- Hobbs, V., & Kubanyiova, M. (2008). The challenges of researching language teachers: what research manuals don't tell us. *Language Teaching Research*, 12, 495–513.

- Hobfoll, S. (1989). Conservation of resources: A new attempt at conceptualizing stress. *American Psychologist*, *44*, 513–524.
- Hobfoll, S. (2001). The influence of culture, community, and the nested self in the stress process: Advancing conservation of resources theory. *Applied Psychology*, *50*, 337–370.
- Hochschild, A. R. (1983). *The managed heart: Commercialization of human feeling*. Berkeley, CA: University of California Press.
- Holland, J. H. (1992). Complex adaptive systems. *Daedalus*, *121*, 17–30.
- Holland, J. H. (1995). *Hidden order*. Cambridge, MA: MIT Press.
- Holland, J. H. (2006). Studying complex adaptive systems. *Journal of Systems Science and Complexity*, *19*, 1–8.
- Holland, J. H. (2012). *Signals and boundaries: Building blocks for complex adaptive systems*. Cambridge, MA: MIT Press.
- Hong, J. Y. (2010). Pre-service and beginning teachers' professional identity and its relation to dropping out of the profession. *Teaching and Teacher Education*, *26*, 1530–1543.
- Horn, I. S., Nolen, S. B., Ward, C., & Campbell, S. S. (2008). Developing practices in multiple worlds: The role of identity in learning to teach. *Teacher Education Quarterly*, *35*(3), 61–72.
- Howard, S., & Johnson, B. (2004). Resilient teachers: Resisting stress and burnout. *Social Psychology of Education*, *7*, 399–420.
- Hu, G., & McKay, S. (2012). English language education in East Asia: Some recent developments. *Journal of Multilingual and Multicultural Development*, *33*, 345–362.

- Hult, F. (2010). The complexity turn in educational linguistics. *Language, Culture and Curriculum, 23*, 173–177.
- Imler, J., & Hoffmann, J. (2001). Toll receptors in innate immunity. *Trends in Cell Biology, 11*, 304–311.
- Ingersoll, R. M., & Strong, M. (2011). The impact of induction and mentoring programs for beginning teachers. *Review of Educational Research, 81*, 201–233.
- James, C. (2011). The importance of affective containment for teacher effectiveness and successful educational change. In C. Day & J.C.-K. Lee (Eds.), *New understandings of teacher's work: Emotions and educational change* (pp. 119–134). New York, NY: Springer.
- Janeway, C., & Medzhitov, R. (2002). Innate immune recognition. *Annual Review of Immunology, 20*, 197–216.
- Janeway, C., Travers, P., Walport, M., & Shlomchik, M. (2005). *Immunobiology: The immune system in health and disease* (6th ed.). New York, NY: Garland Science.
- Jenlink, P. (Ed.). (2014). *Teacher identity and the struggle for recognition: Meeting the challenges of a diverse society*. Lanham, MD: Rowman & Littlefield.
- Jennings, P., & Greenberg, M. (2009). The prosocial classroom: Teacher social and emotional competence in relation to student and classroom outcomes. *Review of Educational Research, 79*, 491–525.
- Jepson, E., & Forrest, S. (2006). Individual contributory factors in teacher stress: The role of achievement striving and occupational commitment. *British Journal of Educational Psychology, 76*, 183–197.
- Jessner, U. (2008). A DST model of multilingualism and the role of metalinguistic awareness. *Modern Language Journal, 92*, 270–283.

- Jiang, J., Vauras, M., Volet, S., & Wang, Y. (2016). Teachers' emotions and emotion regulation strategies: Self- and students' perceptions. *Teaching and Teacher Education, 54*, 22–31.
- John, O., Naumann, L., & Soto, C. (2008). Paradigm shift to the integrative Big Five trait taxonomy: History, measurement, and conceptual Issues. In O.P. John, R.W. Robins, & L.A. Pervin (Eds.), *Handbook of personality: Theory and research* (3rd ed.) (pp. 114–158). New York, NY: Guilford Press.
- Johnson, B., Down, B., Le Cornu, R., Peters, J., Sullivan, A., Pearce, J., & Hunter, J. (2014). Promoting early career teacher resilience: a framework for understanding and acting. *Teachers and Teaching, 20*, 530–546.
- Johnson, K. E., & Golombek, P. (Eds.). (2002). *Narrative inquiry as professional development*. New York, NY: Cambridge University Press.
- Johnson, N. (2009). *Simply complexity: A clear guide to complexity theory*. Oxford, England: Oneworld Publications.
- Jörg, T. (2011). *New thinking in complexity for the social sciences and humanities: A generative, transdisciplinary approach*. Dordrecht, The Netherlands: Springer.
- Jost, J., Bertschinger, N., & Olbrich, E. (2010). Emergence. *New Ideas in Psychology, 28*, 265–273.
- Juarrero, A. (1999). *Dynamics in action: Intentional behavior as a complex system*. Cambridge, MA: MIT Press.
- Judge, T., & Kammeyer-Mueller, J. (2012). Job attitudes. *Annual Review of Psychology, 63*, 341–367.
- Judge, T., Erez, A., Bono, J., Thoresen, C. (2002). Are measures of self-esteem, neuroticism, locus of control, and generalized self-efficacy indicators of a

- common core construct? *Journal of Personality and Social Psychology*, 83, 693–710.
- Kadushin, C. (2012). *Understanding social networks: Theories, concepts, and findings*. Oxford, England: Oxford University Press.
- Kalaja, P., Menezes, V., & Barcelos, A. (Eds.). (2008). *Narratives of learning and teaching EFL*. Basingstoke, England: Palgrave Macmillan.
- Kane, M., & Trochim, W. (2007). *Concept mapping for planning and evaluation*. Thousand Oaks, CA: SAGE.
- Kanno, Y., & Stuart, C. (2011). Learning to become a second language teacher: Identities-in practice. *Modern Language Journal*, 95, 236–252.
- Kaplan, A. (2014). Theory and research on teachers' motivation: Mapping an emerging conceptual terrain. In P.W. Richardson, S.A. Karabenick, & H.M. Watt (Eds.), *Teacher motivation: Theory and practice* (pp. 52–66). New York, NY: Routledge.
- Kaplan, A., Katz, I., & Flum, H. (2012). Motivation theory in educational practice: Knowledge claims, challenges, and future directions. In K.R. Harris, S. Graham, and T. Urdan (Eds.), *APA educational psychology handbook: Vol. 2. individual differences and cultural and contextual factors* (pp. 165–194). Washington, DC: APA Press.
- Kasper, G., & Prior, M. (2015). Analyzing storytelling in TESOL interview research. *TESOL Quarterly*, 49, 226–255.
- Kauffman, S. (1995). *At home in the universe: The search for the laws of self-organization and complexity*. New York, NY: Oxford University Press.
- Kaufman, L., & Rousseeuw, P. (2005). *Finding groups in data: An introduction to cluster analysis*. Hoboken, NJ: Wiley-Interscience.

- Kay, A. (2000). Overview of allergy and allergic diseases: With a view to the future. *British Medical Bulletin*, *56*, 843–864.
- Kelchtermans, G. (2005). Teachers' emotions in educational reforms: self-understanding, vulnerable commitment and micropolitical literacy. *Teaching and Teacher Education*, *21*, 995–1006.
- Kelchtermans, G. (2011). Vulnerability in teaching: The moral and political roots of a structural condition. In C. Day & J.C.–K. Lee (Eds.), *New understandings of teacher's work: Emotions and educational change* (pp. 65–82). New York, NY: Springer.
- Keller, M., Goetz, T., Woolfolk Hoy, A., & Frenzel, A. (2016). Teacher enthusiasm: reviewing and redefining a complex construct. *Educational Psychology Review*, doi:10.1007/s10648-015-9354-y
- Kelley, T. (2005). Natural resilience and innate mental health. *American Psychologist*, *60*, 65.
- Kelso, J. A. S. (1995). *Dynamic patterns: The self-organization of brain and behavior*. Cambridge, MA: MIT Press.
- Kelso, J. A. S. (2002). Self-organizing dynamical systems. In N. Smelser & P. Baltes (Eds.), *International encyclopedia of the social and behavioral sciences*. (pp. 13844–13850) Oxford, England: Elsevier.
- Kiel, L., & Elliot, E. (Eds.). (1996). *Chaos theory in the social sciences: Foundations and applications*. Ann Arbor, MI: University of Michigan Press.
- Kieschke, U., & Schaarschmidt, U. (2008). Professional commitment and health among teachers in Germany: A typological approach. *Learning and Instruction*, *18*, 429–437.

- Kim, E., & Lee, T. (2005). Teachers' perceptions on evaluating ineffective elementary and secondary teachers in Korea. *The Journal of Educational Administration*, 23(4), 77–101.
- Kim, E., Kim, J., & Han, Y. (2009). *Secondary teacher policy research in Asia: Secondary education and teacher quality in the Republic of Korea*. Bangkok: UNESCO. Retrieved from <http://unesdoc.unesco.org/images/0018/001864/186494e.pdf>
- Kim, H. (2015). Private education as de facto language policy in South Korea. *Working Papers in Educational Linguistics*, 30, 87–104.
- Kim, H., & Cho, Y. (2014). Pre-service teachers' motivation, sense of teaching efficacy, and expectation of reality shock. *Asia-Pacific Journal of Teacher Education*, 42, 67–81.
- Kim, H., Kim, E., & Han, Y. (2008). Projecting demand and supply of elementary and secondary teachers in Korea. *The Journal of Economics and Finance of Education*, 17(2), 59–83.
- Kim, I. (2006). *The public opinion survey of education: KEDI Poll 2006*. Seoul, Korean Educational Development Institute.
- King, R. (2015). *Cluster analysis and data mining: An introduction*. Dulles, VA: Mercury.
- Klassen, R., & Chiu, M. M. (2010). Effects on teacher self-efficacy and job satisfaction: Teacher gender, years of experience, and job stress. *Journal of Educational Psychology*, 102, 741–756.
- Klassen, R., & Tze, V. M. C. (2014). Teachers' self-efficacy, personality, and teaching effectiveness: A meta-analysis. *Educational Research Review*, 12, 59–76.

- Klassen, R., Al-Dhafri, S., Hannok, W., & Betts, S. (2011). Investigating pre-service teacher motivation across cultures using the Teachers' Ten Statements Test. *Teaching and Teacher Education, 27*, 579–588.
- Klassen, R., Tze, V. M. C., Betts, S., & Gordon, K. (2011). Teacher efficacy research 1998–2009: Signs of progress or unfulfilled promise? *Educational Psychology Review, 23*, 21–43.
- Klein, J. (2004). Interdisciplinarity and complexity: An evolving relationship. *Emergence: Complexity & Organization, 6*(1/2), 2–10.
- Kloos, H., & Van Orden, G. (2009). Soft-assembled mechanisms for the grand theory. In J.P. Spencer, M. Thomas, & J. McClelland (Eds.), *Toward a new grand theory of development? Connectionism and dynamics systems theory reconsidered* (pp. 253–267). Oxford, England: Oxford University Press.
- Klusman, U., Kunter, M., Trautwein, U., Lüdtke, O., & Jürgen, B. (2008). Teachers' occupational well-being and quality of instruction: The important role of self-regulatory patterns. *Journal of Educational Psychology, 100*, 702–715.
- Knight, C. (2007). A resilience framework: Perspectives for educators. *Health Education, 107*, 543–555.
- Kobasa, S. (1979). Stressful life events, personality, and health: An inquiry into hardiness. *Journal of Personality and Social Psychology, 37*, 1–11.
- Kobasa, S. (1982). Commitment and coping in stress resistance among lawyers. *Journal of Personality and Social Psychology, 42*, 707–717.
- Kobasa, S., Maddi, S., & Courington, S. (1981). Personality and constitution as mediators in the stress-illness relationship. *Journal of Health and Social Behavior, 22*, 368–378.

- Kobasa, S., Maddi, S., & Kahn, S. (1982). Hardiness and health: A prospective study. *Journal of Personality and Social Psychology*, 42, 168–177.
- Kobasa, S., Maddi, S., & Zola, M. (1983). Type A and hardiness. *Journal of Behavioral Medicine*, 6, 41–51.
- Koeske, G., & Koeske R. (1989). Construct validity of the Maslach Burnout Inventory: A critical review and reconceptualization. *Journal of Applied Behavioral Science*, 25, 131–144.
- KOSTAT. (2015). Private Education Expenditures Survey in 2014. Retrieved from <http://kostat.go.kr/portal/english/news/1/19/5/index.board?bmode=read&bSeq=&aSeq=334971&pageNo=1&rowNum=10&navCount=10&currPg=&sTarget=title&sTxt=>
- Kra, B. (2009). Introduction to ergodic theory. In R. Meyers (Ed.), *Encyclopedia of complexity and systems science* (pp. 3053–3055). New York, NY: Springer.
- Kubanyiova, M. (2009). Possible selves in language teacher development. In Z. Dörnyei & E. Ushioda (Eds.), *Motivation, language identity, and the L2 self* (pp. 314–332). Bristol, England: Multilingual Matters.
- Kubanyiova, M. (2012). *Teacher development in action: Understanding language teachers' conceptual change*. Basingstoke, England: Palgrave Macmillan.
- Kubanyiova, M. (2015). The role of teachers' future self guides in creating L2 development opportunities in teacher-led classroom discourse: Reclaiming the relevance of language teacher cognition. *Modern Language Journal*, 99, 565–584.
- Kubanyiova, M., & Feryok, A. (2015). Language teacher cognition in applied linguistics research: Revisiting the territory, Redrawing the boundaries, reclaiming the relevance. *Modern Language Journal*, 99, 435–449.

- Kuhn, L. (2008). Complexity and educational research: A critical reflection. In M. Mason (Ed.), *Complexity theory and the philosophy of education* (pp. 169–180). Chichester, England: Wiley-Blackwell.
- Kumazawa, M. (2013). Gaps too large: Four novice EFL teachers' self-concept and motivation. *Teaching and Teacher Education, 33*, 45–55.
- Kunter, M., Frenzel, A., Nagy, G., Baumert, J., & Pekrun, R. (2011). Teacher enthusiasm: Dimensionality and context specificity. *Contemporary Educational Psychology, 36*, 289–301.
- Kyriacou, C. (2001). Teacher stress: directions for future research. *Educational Review, 53*, 27–35.
- Kyriacou, C., & Coulthard, M. (2000). Undergraduates' views of teaching as a career. *Journal of Education for Teaching, 26*, 117–126.
- Kyriacou, C., & Sutcliffe, J. (1977). Teacher stress: a review. *Educational Review, 29*, 299–306.
- Lamb, M., & Wedell, M. (2015). Cultural contrasts and commonalities in inspiring language teaching. *Language Teaching Research, 19*, 207–224.
- Langer, E., & Moldoveanu, M. (2000). The construct of mindfulness. *Journal of Social Issues, 56*, 1–9.
- Lansing, J. S. (2003). Complex adaptive systems. *Annual Review of Anthropology, 32*, 183–204.
- Larsen–Freeman, D. (1997). Chaos/complexity science and second language acquisition. *Applied Linguistics, 18*, 141–165.

- Larsen–Freeman, D. (2006). The emergence of complexity, fluency, and accuracy in the oral and written production of five Chinese learners of English. *Applied Linguistics*, 27, 590–619.
- Larsen–Freeman, D. (2010). Not so fast: A discussion of L2 morpheme processing and acquisition. *Language Learning*, 60, 221–230.
- Larsen–Freeman, D. (2012). Complex, dynamic systems: A new transdisciplinary theme for applied linguistics? *Language Teaching*, 45, 202–214.
- Larsen–Freeman, D. (2013). Complexity theory: A new way to think. *Revista Brasileira de Linguística Aplicada*, 13, 369–373.
- Larsen–Freeman, D. (2015a). Saying what we mean: Making a case for ‘language acquisition’ to become ‘language development’. *Language Teaching*, 48, 491–505.
- Larsen–Freeman, D. (2015b). Ten ‘lessons’ from complex dynamic systems theory: What is on offer. In Z. Dörnyei, P.D. MacIntyre, & A. Henry (Eds.), *Motivational dynamics in language learning* (pp. 11–19). Bristol, England: Multilingual Matters.
- Larsen–Freeman, D., & Cameron, L. (2008a). *Complex systems and applied linguistics*. Oxford, England: Oxford University Press.
- Larsen–Freeman, D., & Cameron, L. (2008b). Research methodology on language development from a complex systems perspective. *Modern Language Journal*, 92, 200–213.
- Lasky, S. (2005). A sociocultural approach to understanding teacher identity, agency and professional vulnerability in a context of secondary school reform. *Teaching and Teacher Education*, 21, 899–916.

- Le Cornu, R. (2009). Building resilience in pre-service teachers. *Teaching and Teacher Education, 25*, 717–723.
- Leary, M., & Tangney, J. (Eds.). (2012). *Handbook of self and identity* (2nd ed.). New York, NY: Guilford.
- Lebel, L., Anderies, J., Campbell, B., Folke, C., Hatfield–Dodds, S., Hughes, T., & Wilson, J. (2006). Governance and the capacity to manage resilience in regional social-ecological systems. *Ecology and Society, 11*, 1–19.
- Lee, J. (2002). *Education policy in the Republic of Korea: Building block or stumbling block?* Paper prepared for Social Development in East Asia, a research project of the Brain Trust Program at the World Bank Institute/World Bank. Retrieved from <http://siteresources.worldbank.org/WBI/Resources/wbi37164.pdf>.
- Lee, M. (2008). The PISA results and the education system in Korea. Korea Institute of Curriculum and Evaluation. Retrieved from http://www.isei-ivei.net/eng/evaleng/ponencias-ingles/educaiton_in_Korea_MKLEE.pdf
- Lewis, M. (2005). Bridging emotion theory and neurobiology through dynamic systems modeling. *Behavioral and Brain Sciences, 28*, 169–245.
- Lewis, M., Haviland–Jones, J., Barrett, L. (Eds.). (2008). *Handbook of emotions* (3rd ed.). New York, NY: Guilford.
- Ligier, S., & Sternberg, E. (2000). Immune response. In G. Fink (Ed.), *Encyclopedia of stress* (pp. 523–530). San Diego, CA: Academic Press.
- Lim, H. W. (2011). Concept maps of Korean EFL student teachers' autobiographical reflections on their professional identity formation. *Teaching and Teacher Education, 27*, 969–981.

- Lipsitt, L., & Demick, J. (2012). Theory and measurement of resilience: Views from development. In M. Ungar (Ed.), *The social ecology of resilience: A handbook of theory and practice* (pp. 43–52). New York, NY: Springer.
- Litz, B. (2005). Has resilience to severe trauma been underestimated? *American Psychologist, 60*, 262.
- Liu, Y., & Xu, Y. (2011). Inclusion or exclusion?: A narrative inquiry of a language teacher's identity experience in the new work order of competing pedagogies. *Teaching and Teacher Education, 27*, 589–597.
- Livingston, K. (2014). Teacher educators: Hidden professionals? *European Journal of Education, 49*, 218–232.
- Long, J., & Woolfolk Hoy, A. (2006). Interested instructors: A composite portrait of individual differences and effectiveness. *Teaching and Teacher Education, 22*, 303–314.
- Lortie, D. C. (1975). *Schoolteacher: A sociological study*. Chicago, IL: University of Chicago Press.
- Loughran, J. J. (2002). Effective reflective practice: In search of meaning in learning and teaching. *Journal of Teacher Education, 53*, 33–43.
- Lowie, W., & Verspoor, M. (2015). Variability and variation in second language acquisition orders: A dynamic reevaluation. *Language Learning, 65*, 63–88.
- Lundberg, U. (2000). Workplace stress. In G. Fink (Ed.), *Encyclopedia of stress* (pp. 684–692). San Diego, CA: Academic Press.
- Luthar, S., Chicchetti, D., & Becker, B. (2000). The construct of resilience: A critical evaluation and guidelines for future work. *Child Development, 71*, 543–562.

- Luyckx, K., Schwartz, S. J., Goossens, L., Beyers, W., & Missotten, L. (2011). Processes of personal identity formation and evaluation. In S.J. Schwartz, K. Luyckx, & V.L. Vignoles (Eds.), *Handbook of identity theory and research* (pp. 77–98). New York, NY: Springer.
- Macdonald, S., & McIntyre, P. (1997). The generic Job Satisfaction Scale: Scale development and its correlates. *Employee Assistance Quarterly, 13*(2), 1–16.
- MacIntyre, P. D., Gregersen, T., & Mercer, S. (2016). *Positive psychology in SLA*. Bristol, England: Multilingual Matters.
- MacIntyre, P. D., & Legatto, J. (2011). A dynamic system approach to willingness to communicate: Developing an idiodynamic method to capture rapidly changing affect. *Applied Linguistics, 32*, 149–171.
- MacKenzie, A. (2005). The problem of the attractor: A singular generality between sciences and social theory. *Theory, Culture & Society, 22*(5), 45–65.
- MacWhinney, B. (1998). Models of the emergence of language. *Annual Review of Psychology, 49*, 199–227.
- Maddi, S. (1999a). The personality construct of hardiness: I. Effects on experiencing, coping, and strain. *Consulting Psychology Journal, 51*, 83–94.
- Maddi, S. (1999b). Comments on trends in hardiness research and theorizing. *Consulting Psychology Journal, 51*, 67–71.
- Maddi, S. (2004). Hardiness: An operationalization of existential courage. *Journal of Humanistic Psychology, 44*, 279–298.
- Maddi, S. (2005). On hardiness and other pathways to resilience. *American Psychologist, 60*, 261–262.

- Maddi, S., Harvey, R., Khoshaba, D., Fazel, M., & Resurreccion, N. (2009). The personality construct of hardiness, IV: Expressed in positive cognitions and emotions concerning oneself and developmentally relevant activities. *Journal of Humanistic Psychology, 49*, 292–305.
- Maddi, S., Harvey, R., Khoshaba, D., Fazel, M., & Resurreccion, N. (2012). The relationship of hardiness and some other relevant variables to college performance. *Journal of Humanistic Psychology, 52*, 190–205.
- Maddi, S., Harvey, R., Khoshaba, D., Lu, J., Persico, M., & Brow, M. (2006). The personality construct of hardiness, III: Relationships with repression, innovativeness, authoritarianism, and performance. *Journal of Personality, 74*, 575–597.
- Maddi, S., & Hightower, M. (1999). Hardiness and optimism as expressed in coping patterns. *Consulting Psychology Journal, 51*, 95–105.
- Maddi, S., Khoshaba, D., Harvey, R., Fazel, M., & Resurreccion, N. (2011). The personality construct of hardiness, V: Relationships with the construction of existential meaning in life. *Journal of Humanistic Psychology, 51*, 369–388.
- Madni, A., Baker, E., Chow, K., Delacruz, G., & Griffin, N. (2015). Assessment of teachers from a social psychological perspective. *Review of Research in Education, 39*, 54–86.
- Maeng, U., & Lee, S.-M. (2014). EFL teachers' behavior of using motivational strategies: The case of teaching in the Korean context. *Teaching and Teacher Education, 46*, 25–36.
- Maier, S., Watkins, L., & Fleshner, M. (1994). Psychoneuroimmunology: The interface between behavior, brain, and immunity. *American Psychologist, 49*, 1004–1017.

- Malmberg, L.-E. (2006). Goal-orientation and teacher motivation among teacher applicants and student teachers. *Teaching and Teacher Education, 22*, 58–76.
- Mansfield, C., & Beltman, S. (2014). Teacher motivation from a goal content perspective: Beginning teachers' goals for teaching. *International Journal of Educational Research, 65*, 54–64.
- Mansfield, C., Beltman, S., Price, A., & McConney, A. (2012). “Don’t sweat the small stuff:” Understanding teacher resilience at the chalkface. *Teaching and Teacher Education, 28*, 357–367.
- Manson, S. (2001). Simplifying complexity: A review of complexity theory. *Geoforum, 32*, 405–414.
- Martel, J., & Wang, F. (2015). Language teacher identity. In M. Bigelow & J. Enns-Kananen (Eds.), *The Routledge handbook of educational linguistics* (pp. 289–300). New York, NY: Routledge.
- Martin, A., & Marsh, H. (2006). Academic resilience and its psychological and educational correlates: A construct validity approach. *Psychology in the Schools, 43*, 267–281.
- Martin, A., & Marsh, H. (2008). Academic buoyancy: Towards an understanding of students' everyday academic resilience. *Journal of School Psychology, 46*, 53–83.
- Maslach, C. (2001). What have we learned about burnout and health? *Psychology and Health, 16*, 607–611.
- Maslach, C. (2011). Burnout and engagement in the workplace: New perspectives. *The European Health Psychologist, 13*(3), 44–47.
- Maslach, C., & Jackson, S. (1981). The measurement of experienced burnout. *Journal of Occupational Behavior, 2*, 99–113.

- Maslach, C., & Leiter, M. (2000). Burnout. In G. Fink (Ed.), *Encyclopedia of stress* (pp. 358–362). San Diego, CA: Academic Press.
- Maslach, C., & Leiter, M. (2008). Early predictors of job burnout and engagement. *Journal of Applied Psychology, 93*, 498–512.
- Mason, M. (Ed.). (2008). *Complexity theory and the philosophy of education*. Chichester, England: Wiley-Blackwell.
- Masten, A. (2001). Ordinary magic: Resilience processes in development. *American Psychologist, 56*, 227–238.
- Masten, A. (2009). Ordinary magic: Lessons from research on resilience in human development. *Education Canada, 49*(3), 28–33.
- Masten, A., & Osofsky, J. (2010). Disasters and their impact on child development: Introduction to the special section. *Child Development, 81*, 1029–1039.
- Masten, A., Best, K., & Garmezy, N. (1990). Resilience and development: Contributions from the study of children who overcome adversity. *Development and Psychopathology, 2*, 425–444.
- Mayer, D., & Turner, J. (2007). Scaffolding emotions in classrooms. In P. Schutz & R. Pekrun (Eds.), *Emotions in education* (pp. 243–258). San Diego, CA: Academic Press.
- McAdams, D. (2001). The psychology of life stories. *Journal of General Psychology, 5*, 100–122.
- McAdams, D. (2006). The role of narrative in personality psychology today. *Narrative Inquiry, 16*, 11–18.

- McAdams, D. (2008). Personal narratives and the life story. In O.P. John, R.W. Robins, & L.A. Pervin (Eds.), *Handbook of personality theory & research* (3rd ed.) (pp. 242–262). New York, NY: Guilford.
- McAdams, D., & Pals, J. (2006). A new big five: Fundamental principles for an integrative science of personality. *American Psychologist*, *61*, 204–217.
- McCrae, R. (1990). Controlling neuroticism in the measurement of stress. *Stress Medicine*, *6*, 237–241.
- McCrae, R. (1996). Social consequences of experiential openness. *Psychology Bulletin*, *120*, 323–337.
- McCrae, R., & Costa, P. (2008). The five-factor theory of personality. In O.P. John, R.W. Robins, & L.A. Pervin (Eds.), *Handbook of personality: Theory and research* (3rd ed.) (pp. 159–181). New York, NY: Guilford Press.
- McEown, M. S., & Takeuchi, O. (2014). Motivational strategies in EFL classrooms: how do teachers impact students' motivation? *Innovation in Language Learning and Teaching*, *8*, 20–28.
- McEwen, B. (2000). Homeostasis. In G. Fink (Ed.), *Encyclopedia of stress* (pp. 399–400). San Diego, CA: Academic Press.
- McEwen, B., & Wingfield, J. (2010). What's in a name? Integrating homeostasis, allostasis and stress. *Hormones and Behavior*, *57*, 105–111.
- Meara, P. (1997). Towards a new approach to modelling vocabulary acquisition. In N. Schmitt & M. McCarthy (Eds.), *Vocabulary: Description, acquisition and pedagogy* (pp. 109–121). Cambridge, England: Cambridge University Press.
- Meister, D., & Ahrens, P. (2011). Resisting plateauing: Four veteran teachers' stories. *Teaching and Teacher Education*, *27*, 770–778.

- Menard–Warwick, J. (2008). The cultural and intercultural identities of transnational English teachers: Two case studies from the Americas. *TESOL Quarterly*, *42*, 617–640.
- Mercer, S., & Ryan, S. (2010). A mindset for EFL: Learners' beliefs about the role of natural talent. *ELT Journal*, *64*, 436–444.
- Mercer, S. (2012). Self-concept: Situating the self. In S. Mercer, S. Ryan, & M. Williams (Eds.), *Psychology for language learning* (pp. 10–25). Basingstoke, England: Palgrave Macmillan.
- Mercer, S. (2013). Towards a complexity-informed pedagogy for language learning. *Revista Brasileira de Linguística Aplicada*, *13*, 375–398.
- Mercer, S. (2014). The self from a complexity perspective. In S. Mercer & M. Williams (Eds.), *Multiple perspectives on the self in SLA* (pp. 160–176). Bristol, England: Multilingual Matters.
- Mercer, S. (2015). Social network analysis and complex dynamic systems. In Z. Dörnyei, P.D. MacIntyre, & A. Henry (Eds.), *Motivational dynamics in language learning* (pp. 73–82). Bristol, England: Multilingual Matters.
- Mercer, S. (2016). Complexity and language teaching. In G. Hall (Ed.), *The Routledge handbook of English language teaching* (pp. xx–xx). New York, NY: Routledge.
- Merrell, K. W., & Gueldner, B. A. (2010). *Social and emotional learning in the classroom: Promoting mental health and academic success*. New York, NY: Guilford Press.
- Merrell, K., & Gueldner, B. (2010). *Social and emotional learning in the classroom: Promoting mental health and academic success*. New York, NY: Guilford.

- Meyer, D., & Turner, J. (2007). Scaffolding emotions in classrooms. In P. Schutz & R. Pekrun (Eds.), *Emotions in education* (pp. 243–258). San Diego, CA: Academic Press.
- Mifsud, M. (2011). *The relationship of teachers' and students' motivation in ELT in Malta: A mixed methods study* (Unpublished doctoral dissertation). University of Nottingham, England.
- Miles, M., Huberman, M., & Saldaña, J. (2014). *Qualitative data analysis: A methods sourcebook* (3rd ed.). Thousand Oaks, CA: SAGE.
- MOE. (2013, April 11). *Teacher education and qualifications*. Retrieved from http://english.moe.go.kr/web/1701/site/contents/en/en_0213.jsp
- Moir, E., Barlin, D., Gless, J., & Miles, J. (2009). *New teacher mentoring: Hopes and promise for improving teacher effectiveness*. Cambridge, MA: Harvard University Press.
- Moller, A., Deci, E., & Ryan, R. (2006). *Choice and ego-depletion: The moderating role of autonomy*. *Personality and Social Psychology Bulletin*, 32, 1024–1036.
- Moodie, I., & Feryok, A. (2015). Beyond cognition to commitment: English language teaching in South Korean primary schools. *Modern Language Journal*, 99, 450–469.
- Moon, B., Hoffman, R., Novak, J., & Cañas, A. (Eds.) (2011). *Applied concept mapping: Capturing, analyzing, and organizing knowledge*. Boca Raton, FL: CRC Press.
- Morgan, B. (2004). Teacher identity as pedagogy: Towards a field-internal conceptualisation in bilingual and second language education. *International Journal of Bilingual Education and Bilingualism*, 7(2/3), 172–188.

- Morin, E. (1992). From the concept of system to the paradigm of complexity. *Journal of Social and Evolutionary Systems*, 15, 371–385.
- Morin, E. (2008). *On complexity*. Cresskill, NJ: Hampton Press.
- Morowitz, H. (1996). What's in a name? *Complexity*, 1(4), 7–8.
- Morris, J., & Feldman, D. (1996). The dimensions, antecedents, and consequences of emotional labor. *Academy of Management Review*, 21, 986–1010.
- Morrison, G., Brown, M., D'Incau, B., Larson–O'Farrell, S., & Furlong, M. (2006). Understanding resilience in educational trajectories. Implications for protective possibilities. *Psychology in the Schools*, 43, 19–31.
- Morrison, K. (2008). Educational philosophy and the challenge of complexity theory. In M. Mason (Ed.), *Complexity theory and the philosophy of education* (pp. 16–31). Chichester, England: Wiley-Blackwell.
- Morrison, K. (2012). Searching for causality in the wrong places. *International Journal of Social Research Methodology*, 15, 15–30.
- Morton, T., & Gray, J. (2010). Personal practical knowledge and identity in lesson planning conferences on a pre-service TESOL course. *Language Teaching Research*, 14, 297–317.
- Moser, C. (1998). The asset vulnerability framework: Reassessing urban poverty reduction strategies. *World Development*, 26, 1–19.
- Müller, K., Alliata, R., & Benninghoff, F. (2009). Attracting and retaining teachers: A question of motivation. *Educational Management Administration and Leadership*, 37, 574–599.

- Murray, K., & Zautra, A. (2012). Community resilience: Fostering recovery, sustainability, and growth. In M. Ungar (Ed.), *The social ecology of resilience: A handbook of theory and practice* (pp. 337–345). New York, NY: Springer.
- Myers, D. G. (2000). The funds, friends, and faith of happy people. *American Psychologist, 55*, 56–67.
- Näring, G., Briët, M., & Brouwers, A. (2000). Beyond demand-control: Emotional labour and symptoms of burnout in teachers. *Work and Stress, 20*, 303–315.
- Newman, L. (2009). Human–environment interactions: Complex systems approaches for dynamic sustainable development. In R. Meyers (Ed.), *Encyclopedia of complexity and systems science* (pp. 4631–4643). New York, NY: Springer.
- Nias, J. (1996). Thinking about feeling: The emotions in teaching. *Cambridge Journal of Education, 26*, 293–306.
- Niemiec, C., & Ryan, R. (2009). Autonomy, competence, and relatedness in the classroom: Applying self-determination theory to educational practice. *Theory and Research in Education, 7*, 133–144.
- Northrop, R. (2011). *Introduction to complexity and complex systems*. Boca Raton, FL: CRC Press.
- Norton, B., & Toohey, K. (2011). Identity, language learning, and social change. *Language Teaching, 44*, 412–446.
- Nowack, K. (1989). Coping style, cognitive hardiness, and health status. *Journal of Behavioral Medicine, 12*, 145–158.
- Nowak, A., Bui–Wrzosinska, L., Coleman, P., Vallacher, R., Jochemczyk, L., & Bartkowski, W. (2010). Seeking sustainable solutions: Using an attractor

- simulation platform for teaching multi-stakeholder negotiation in complex cases. *Negotiation Journal*, 26, 49–68.
- Nowak, A., Vallacher, R., & Zochowski, M. (2005). The emergence of personality: Dynamic foundations of individual variation. *Developmental Review*, 25, 351–385.
- Nowotny, H. (2005). The increase of complexity and its reduction: Emergent interfaces between the natural sciences, humanities and social sciences. *Theory, Culture and Society*, 22(5), 15–31.
- O’Connor, K. (2008). “You choose to care”: Teachers, emotions and professional identity. *Teaching and Teacher Education*, 24, 117–126.
- O’Sullivan, D. (2009). Complexity theory, nonlinear dynamic spatial systems, In R. Kitchin & N. Thrift (Eds.), *International encyclopedia of human geography* (pp. 239–244). Oxford, England: Elsevier.
- OECD. (2014a). *Education at a glance 2014: OECD indicators*. Retrieved from <http://www.oecd.org/edu/Education-at-a-Glance-2014.pdf>
- OECD. (2014b). *PISA 2012 results in focus*. Retrieved from <http://www.oecd.org/pisa/keyfindings/pisa-2012-results-overview.pdf>
- Olsen, B. (2008). Introducing teacher identity and this volume. *Teacher Education Quarterly*, 35(3), 3–6.
- Olsen, B., & Sexton, D. (2009). Threat rigidity, school reform, and how teachers view their work inside current education policy contexts. *American Educational Research Journal*, 46, 9–44.
- Orange, J. (2008). Formation and function of the lytic NK-cell immunological synapse. *National Review of Immunology*, 8, 713–725.

- Ortega, L. (2012). Epistemological diversity and moral ends of research in instructed SLA. *Language Teaching Research*, 16, 206–226.
- Overton, W. (2007). A coherent metatheory for dynamic systems: Relational organicism-contextualism. *Human Development*, 50, 154–159.
- Overton, W. (2013). A new paradigm for developmental science: Relationism and relational-developmental systems. *Applied Developmental Science*, 17, 94–107.
- Oyserman, D., & James, L. (2011). Possible identities. In S.J. Schwartz, K. Luyckx, & V.L. Vignoles (Eds.), *Handbook of identity theory and research* (pp. 117–145). New York, NY: Springer.
- Oyserman, D., Elmore, K., & Smith, G. (2012). Self, self-concept, and identity (pp. 69–104). In M. Leary & J. Tangney (Eds.), *Handbook of self and identity* (2nd ed.). New York, NY: Guilford.
- Pajares, F. (2001). Toward a positive psychology of academic motivation. *The Journal of Educational Research*, 95, 27–35.
- Palmer, P. (1998). *The courage to teach*. San Francisco, CA: Jossey-Bass.
- Pals, J. (2006). Narrative identity processing of difficult life experiences: Pathways of personality development and positive self-transformation in adulthood. *Journal of Personality*, 74, 1079–1110.
- Pancer, Z., & Cooper, M. (2006). The evolution of adaptive immunity. *Annual Review of Immunology*, 24, 497–518.
- Papi, M., & Abdollahzadeh, E. (2012). L2 teacher motivational practice, student motivation and possible L2 selves: An examination in the Iranian EFL context. *Language Learning*, 62, 571–594.

- Park, J. (2009). "English fever" in South Korea: Its history and symptoms. *English Today*, 25, 50–57.
- Parker, P., & Martin, A. (2009). Coping and buoyancy in the workplace: Understanding their effects on teachers' work-related well-being and engagement. *Teaching and Teacher Education*, 25, 68–75.
- Parker, P., Martin, A., Colmar, S., & Liem, G. (2012). Teachers' workplace well-being: Exploring a process model of goal orientation, coping behavior, engagement, and burnout. *Teaching and Teacher Education*, 28, 503–513.
- Patterson, J., Collins, L., & Abbott, G. (2004). A study of teacher resilience in urban schools. *Journal of Instructional Psychology*, 31, 3–11.
- Pavlenko, A. (2002). Narrative study: Whose story is it anyway? *TESOL Quarterly*, 36, 213–218.
- Pavlenko, A. (2007). Autobiographic narratives as data in Applied Linguistics. *Applied Linguistics*, 28, 163–188.
- Pearce, J., & Morrison, C. (2011). Teacher identity and early career resilience: Exploring the links. *Australian Journal of Teacher Education*, 36, 48–59.
- Peetz, J., Wilson, A. E., & Strahan, E. J. (2009). So far away: The role of subjective temporal distance to future goals in motivation and behavior. *Social Cognition*, 27, 475–496.
- Pelletier, L., Séguin-Lévesque, C., & Legault, L. (2002). Pressure from above and pressure from below as determinants of teachers' motivation and teaching behaviors. *Journal of Educational Psychology*, 94, 186–196.
- Peterson, C. (1991). Meaning and measurement of explanatory style. *Psychological Inquiry*, 2, 1–10.

- Peterson, C. (2000). The future of optimism. *American Psychologist*, *55*, 44–55.
- Pillen, M. T., Den Brok, P. J., & Beijaard, D. (2013). Profiles and change in beginning teachers' professional identity tensions. *Teaching and Teacher Education*, *34*, 86–97.
- Pintrich, P. (2003). A motivational science perspective on the role of student motivation in learning and teaching contexts. *Journal of Educational Psychology*, *95*, 667–686.
- Pisarik, C., & Shoffner, M. (2009). The relationship among work possible selves, socioeconomic position, and the psychological well-being of individuals in early adulthood. *Journal of Career Development*, *35*, 306–325.
- Pithers, R., & Soden, R. (1998). Scottish and Australian teacher stress and strain: A comparative study. *British Journal of Educational Psychology*, *68*, 269–279.
- Polkinghorne, D. (1988). *Narrative knowing and the human sciences*. Albany, NY: State University of New York Press.
- Portner, H. (2008). *Mentoring new teachers* (3rd ed.). Thousand Oaks, CA: Corwin Press.
- Presson, P., & Benassi, V. (1996). Illusion of control: A meta-analytic review. *Journal of Social Behavior & Personality*, *11*, 493–510.
- Prigogine, I., & Stengers, I. (1984). *Order out of chaos*. New York, NY: Bantam New Age.
- Prince–Embury, S. (2011). Assessing personal resiliency in the context of school settings: Using the resiliency scales for children and adolescents. *Psychology in the Schools*, *48*, 672–685.
- Pronin, E., & Ross, L. (2006). Temporal differences in trait self-ascription: When the self is seen as an other. *Journal of Personality and Social Psychology*, *90*, 197–209.

- Puchta, C., & Potter, J. (2004). *Focus group practice*. Thousand Oaks, CA: SAGE.
- Rabin, B. (2000). Autoimmunity. In G. Fink (Ed.), *Encyclopedia of stress* (pp. 267–275). San Diego, CA: Academic Press.
- Radel, R., Sarrazin, P., Legrain, P., & Wild, T. C. (2010). Social contagion of motivation between teacher and student: Analyzing underlying processes. *Journal of Educational Psychology, 102*, 577–587.
- Radford, M. (2008). Prediction, control and the challenge to complexity. *Oxford Review of Education, 34*, 505–520.
- Raggatt, P. T. F. (2006). Multiplicity and conflict in the dialogical self: A life-narrative approach. In D.P. McAdams, R. Josselson, & A. Lieblich (Eds.), *Identity and story: Creating self in narrative* (pp. 15–35). Washington, DC: American Psychological Association Press.
- Ragin, C. C. (1989). The logic of the comparative method and the algebra of logic. *Journal of Quantitative Anthropology, 1*, 373–398.
- Ragin, C. C. (1992). Introduction: Cases of what is a case? In C.C. Ragin & H. Becker (Eds.), *What is a case? Exploring the foundations of social inquiry* (pp. 1–18). Cambridge, England: Cambridge University Press.
- Ragin, C. C. (1999a). The distinctiveness of case-oriented research. *Health Services Research, 34*, 1137–1151.
- Ragin, C. C. (1999b). Using qualitative comparative analysis to study causal complexity. *Health Services Research, 34*, 1225–1239.
- Ragin, C. C. (2009a). Qualitative comparative analysis (QCA) as an approach. In B. Rihoux & C.C. Ragin (Eds.), *Configurational comparative methods: Qualitative*

- comparative analysis (QCA) and related techniques* (pp. 1–18). Thousand Oaks, CA: SAGE.
- Ragin, C. C. (2009b). Reflections on casing and case-oriented research. In D. Byrne & C.C. Ragin (Eds.), *The SAGE handbook of case-based methods* (pp. 523–534). London, England: SAGE.
- Rahe, R. (2000). Stress and coping. In G. Fink (Ed.), *Encyclopedia of stress* (pp. 541–546). San Diego, CA: Academic Press.
- Reeve, J. (2006). Teachers as facilitators: What autonomy-supportive teachers do and why their students benefit. *The Elementary School Journal*, *106*, 225–236.
- Reich, J., Zautra, A., & Hall, J. S. (Eds.). (2010). *Handbook of adult resilience*. New York, NY: Guilford Press.
- Reitsma, F. (2003). A response to simplifying complexity. *Geoforum*, *34*, 13–16.
- Remijan, K. W. (2014). Improving teacher motivation in secondary schools with hybrid positions. *American Secondary Education*, *42*(3), 30–38.
- Retelsdorf, J., Butler, R., Streblov, L., & Schiefele, U. (2010). Teachers' goal orientations for teaching: Associations with instructional practices, interest in teaching, and burnout. *Learning and Instruction*, *20*, 30–46.
- Rhodewalt, F., & Augustsdottir, S. (1984). On the relationship of hardiness to the Type A behavior pattern: Perception of life events vs. coping with life events. *Journal of Research in Personality*, *18*, 212–213.
- Rhodewalt, F., & Zone, J. (1989). Appraisal of life change, depression, and illness in hardy and nonhardy women. *Journal of Personality and Social Psychology*, *56*, 81–88.

- Richards, L. (2015). *Handling qualitative data: A practical guide* (3rd ed.). Thousand Oaks, CA: SAGE.
- Richardson, G. (2002). The metatheory of resilience and resiliency. *Journal of Clinical Psychology, 58*, 307–321.
- Richardson, P. W., Karabenick, S. A., & Watt, H. M. (Eds.). (2014). *Teacher motivation: Theory and practice*. New York, NY: Routledge.
- Richardson, P. W., & Watt, H. M. (2010). Current and future directions in teacher motivation research. In T. Urdan & S. Karabenick (Eds.), *The decade ahead: Applications and contexts of motivation and achievement* (pp. 139–173). London, England: Emerald.
- Rihoux, B., & Lobe, B. (2009). The case for qualitative comparative analysis (QCA): Adding leverage for thick cross-case comparison. In D. Byrne & C.C. Ragin (Eds.), *The SAGE handbook of case-based methods* (pp. 222–242). London, England: SAGE.
- Rihoux, B., & Ragin, C. C. (Eds.). (2009). *Configurational comparative methods: Qualitative comparative analysis (QCA) and related techniques*. Thousand Oaks, CA: SAGE.
- Roger, D. (2000). Self-esteem, stress, and emotion. In G. Fink (Ed.), *Encyclopedia of stress* (pp. 412–416). San Diego, CA: Academic Press.
- Roisman, G. (2005). Conceptual clarifications in the study of resilience. *American Psychologist, 60*, 264–265.
- Rose, N. (2008). Immunologic diagnosis of autoimmunity. In M. O’Gorman & A. Donnenberg (Eds.), *Handbook of human immunology* (2nd ed.) (pp. 369–382). Boca Raton, FL: CRC Press.

- Roth, D., Wiebe, D., Fillingim, R., & Shay, K. (1989). Life events, fitness, hardiness, and health – A simultaneous analysis of proposed stress-resistance effects. *Journal of Personality and Social Psychology, 57*, 136–142.
- Roth, G. (2014). Antecedents and outcomes of teachers' autonomous motivation: A self-determination theory analysis. In P.W. Richardson, S.A. Karabenick, & H.M. Watt (Eds.), *Teacher motivation: Theory and practice* (pp. 36–51). New York, NY: Routledge.
- Roth, G., Assor, A., Kanat-Maymon, Y., & Kaplan, H. (2007). Autonomous motivation for teaching: How self-determined teaching may lead to self-determined learning. *Journal of Educational Psychology, 99*, 761–774.
- Rubin, H., & Rubin, I. (2012). *Qualitative interviewing: The art of hearing data* (3rd ed.). Los Angeles, CA: SAGE.
- Ruesch, A., Bown, J., & Dewey, D. P. (2012). Student and teacher perceptions of motivational strategies in the foreign language classroom. *Innovation in Language Learning and Teaching, 6*, 15–27.
- Russell, D., Altmaier, E., & Van Velzen, D. (1987). Job-related stress, social support, and burnout among classroom teachers. *Journal of Applied Psychology, 72*, 269–274.
- Rutter, M. (1987). Psychosocial resilience and protective mechanisms. *American Journal of Orthopsychiatry, 57*, 316–331.
- Rutter, M. (2012). Resilience: Causal pathways and social ecology. In M. Ungar (Ed.), *The social ecology of resilience: A handbook of theory and practice* (pp. 33–42). New York, NY: Springer.

- Ryan, R., & Deci, E. (2009). Promoting self-determined school engagement: Motivation, learning, and well-being. In K. Wentzel & A. Wigfield (Eds.), *Handbook of motivation at school* (pp. 171–196). New York, NY: Routledge.
- Ryan, S., & Irie, K. (2014). Imagined and possible selves: Stories we tell ourselves about ourselves. In S. Mercer & M. Williams (Eds.), *Multiple perspectives on the self in SLA* (pp. 109–126). Bristol, England: Multilingual Matters.
- Sachs, J. (2001). Teacher professional identity: Competing discourses, competing outcomes. *Journal of Education Policy*, *16*, 149–161.
- Saldaña, J. (2015). *The coding manual for qualitative researchers* (3rd ed.). London, England: SAGE.
- Sandvik, A., Bartone, P., Hystad, S., Phillips, T., Thayer, J., & Johnsen, B. (2013). Psychological hardiness predicts neuroimmunological responses to stress. *Psychology, Health & Medicine*, *18*(4), 1–11.
- Sanz, C., & Leow, R. (Eds.). (2011). *Implicit and explicit language learning: Conditions, processes, and knowledge in SLA and bilingualism*. Washington, DC: Georgetown University Press.
- Sarbin, T. R. (1986). The narrative as a root metaphor for psychology. In T.R. Sarbin (Ed.), *Narrative psychology: The storied nature of human conduct* (pp. 3–21). New York, NY: Praeger.
- Saulsman, L., & Page, A. (2004). The five-factor model and personality disorder empirical literature: A meta-analytic review. *Clinical Psychology Review*, *23*, 1055–1085.

- Schaufeli, W., & Bakker, A. (2004). Job demands, job resources and their relationship with burnout and engagement: A multi-sample study. *Journal of Organizational Behavior, 25*, 293–315.
- Schaufeli, W., & Greenglass, E. (2001). Introduction to special issue on burnout and health. *Psychology and Health, 16*, 501–510.
- Schaufeli, W., & Salanova, M. (2007). Efficacy or inefficacy, that's the question: Burnout and work engagement and their relationship with efficacy beliefs. *Anxiety, Stress and Coping, 20*, 177–196.
- Schaufeli, W., Bakker, A., & Salanova, M. (2006). The measurement of work engagement with a short questionnaire: A cross-national study. *Educational and Psychological Measurement, 66*, 701–716.
- Schaufeli, W., Bakker, A., Hoogduin, K., Schaap, C., & Kladler, A. (2001). On the clinical validity of the Maslach Burnout Inventory and the Burnout Measure. *Psychology and Health, 16*, 565–582.
- Scheier, M., & Carver, C. (1985). Optimism, coping and health: Assessment and implications of generalized outcome expectancies on health. *Health Psychology, 4*, 219–247.
- Scheier, M., Carver, C., & Bridges, M. (1994). Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): A reevaluation of the life orientation test. *Journal of Personality and Social Psychology, 67*, 1063–1078.
- Scheier, M., Weintraub, J., & Carver, C. (1986). Coping with stress: Divergent strategies of optimists and pessimists. *Journal of Personality and Social Psychology, 51*, 1257–1264.

- Schulkin, J. (2003). *Rethinking homeostasis: Allostatic regulation in physiology and pathophysiology*. Cambridge, MA: MIT Press.
- Schulkin, J. (2011). Social allostasis: Anticipatory regulation of the internal milieu. *Frontiers in Evolutionary Neuroscience*, 2(111), 1–15.
- Schultz, K., & Ravitch, S. (2013). Narratives of learning to teach: Taking on professional identities. *Journal of Teacher Education*, 64, 35–46.
- Schutte, N., Toppinen, S., Kalimo, R., & Schaufeli, W. (2000). The factorial validity of the Maslach Burnout Inventory-General Survey (MBI-GS) across occupational groups and nations. *Journal of Occupational and Organizational Psychology*, 73, 53–67.
- Schutz, P., & Lee, M. (2014). Teacher emotion, emotional labor and teacher identity. *Utrecht Studies in Language & Communication*, 27, 169–186.
- Schutz, P., & Pekrun, R. (Eds.). (2007). *Emotions in education*. San Diego, CA: Academic Press.
- Schutz, P., & Zembylas, M. (Eds.). (2009). *Advances in teacher emotion research: The impact on teachers' lives*. Dordrecht, The Netherlands: Springer.
- Schwartz, S. J., Luyckx, K., & Vignoles, V. L. (Eds.). (2011). *Handbook of identity theory and research*. New York, NY: Springer.
- Sedikides, C. (2012). Self-protection. In M.R. Leary & J.P. Tangney (Eds.), *Handbook of self and identity* (2nd ed.) (pp. 327–353). New York, NY: Guilford.
- Seedhouse, P. (2010). Locusts, snowflakes and recasts: Complexity theory and spoken interaction. *Classroom Discourse*, 1, 4–24.

- Segerstrom, S., & Miller, G. (2004). Psychological stress and the human immune system: A meta-analytic study of 30 years of inquiry. *Psychological Bulletin, 130*, 601–630.
- Seidman, I. (2013). *Interviewing as qualitative research* (4th ed.). Columbia, NY: Teachers College Press.
- Seligman, M. (2004). *Authentic happiness: Using the new positive psychology to realize your potential for lasting fulfillment*. New York, NY: Atria Books.
- Seligman, M., & Csikszentmihalyi, M. (2000). Positive psychology: An introduction. *American Psychologist, 55*, 5–14.
- Seo, J., Kim, M. and Jeon, J. (2005). Exploration of policy directions and tasks for the teacher compensation system in Korea. *The Journal of Economics and Finance of Education, 14*, 215–243.
- Seth, M. (2002). Education fever: Society, politics, and the pursuit of schooling in South Korea. Honolulu, HI: University of Hawaii Press.
- Shapiro, S. (2010). Revisiting the teachers' lounge: Reflections on emotional experience and teacher identity. *Teaching and Teacher Education, 26*, 616–623.
- Sheldon, K., Turban, D., Brown, K., Barrick, M., & Judge, T. (2003). Applying self-determination theory to organizational research. *Research in Personnel and Human Resource Management, 22*, 357–393.
- Shen, J., Leslie, J., & Spybrook, J., & Ma, X. (2012). Are principal background and school processes related to teacher job satisfaction? A multilevel study using schools and staffing survey 2003–2004. *American Educational Research Journal, 49*, 200–230.

- Shoaib, A. (2004). *What motivates and demotivates English teachers in Saudi Arabia: A qualitative perspective* (Unpublished doctoral dissertation). University of Nottingham, England.
- Siegfried, R. (2014). *Modeling and simulation of complex systems: A framework for efficient agent-based modeling and simulation*. Berlin, Germany: Springer.
- Simbula, S., Panari, C., Guglielmi, D., & Fraccaroli, F. (2012). Teachers' well-being and effectiveness: The role of the interplay between job demands and job resources. *Procedia – Social and Behavioral Sciences*, 69, 729–738.
- Simon–Maeda, A. (2004). The complex construction of professional identities: Female EFL educators in Japan speak out. *TESOL Quarterly*, 38, 405–436.
- Singer, J. (2004). Narrative identity and meaning making across the adult lifespan: An introduction. *Journal of Personality*, 72, 437–459.
- Skaalvik, E., & Skaalvik, S. (2007). Dimensions of teacher self-efficacy and relations with strain factors, perceived collective teacher efficacy, and teacher burnout. *Journal of Educational Psychology*, 99, 611–625.
- Skaalvik, E., & Skaalvik, S. (2009). Does school context matter? Relations with teacher burnout and job satisfaction. *Teaching and Teacher Education*, 25, 518–524.
- Skaalvik, E., & Skaalvik, S. (2010). Teacher self-efficacy and teacher burnout: a study of relations. *Teaching and Teacher Education*, 26, 1059–1069.
- Smith, B., Dalen, J., Wiggins, K., Tooley, E., Christopher, P., & Bernard, J. (2008). The Brief Resilience Scale: Assessing the ability to bounce back. *International Journal of Behavioral Medicine*, 15, 194–200.

- Snyder, C. R. (2000). Hypothesis: There is hope. In C.R. Snyder (Ed.), *Handbook of hope: Theory, measures, and applications* (pp. 3–21). San Diego, CA: Academic Press.
- Snyder, C. R., & Higgins, R. L. (1997). Reality negotiation: Governing one's self and being governed by others. *Review of General Psychology, 4*, 336–350.
- Soenens, B., Sierens, E., Vansteenkiste, M., Dochy, F., & Goossens, L. (2012). Psychologically controlling teaching: Examining outcomes, antecedents, and mediators. *Journal of Educational Psychology, 104*, 108-120.
- Somerfield, M., & McCrae, R. (2000). Stress and coping research. *American Psychologist, 55*, 620–625.
- Song, J. (2011). English as an official language in South Korea: Global English or social malady? *Language Problems and Language Planning, 35*, 35–55.
- Song, J. (2012). The struggle over class, identity, and language: A case study of South Korean transnational families. *Journal of Sociolinguistics, 16*, 201–217.
- Søreide, G. E. (2006). Narrative construction of teacher identity: Positioning and negotiation. *Teachers and Teaching: Theory and Practice, 12*, 527–547.
- Spoelman, M., & Verspoor, M. (2010). Dynamic patterns in development of accuracy and complexity: A longitudinal case study in the acquisition of Finnish. *Applied Linguistics, 31*, 532–553.
- Stanley, C. (1999). Learning to think, feel and teach reflectively. In J. Arnold (Ed.), *Affect in language learning* (pp. 109–124). Cambridge, England: Cambridge University Press.

- Steinhardt, M., Jaggars, S., Faulk, K., & Gloria, C. (2000). Chronic work stress and depressive symptoms: Assessing the mediating role of teacher burnout. *Stress and Health, 27*, 420–429.
- Stephoe, A. (2000). Control and stress. In G. Fink (Ed.), *Encyclopedia of stress* (pp. 526–531). San Diego, CA: Academic Press.
- Storbeck, J., & Clore, G. (2007). On the interdependence of cognition and emotion. *Cognition and Emotion, 21*, 1212–1237.
- Strauss, A., & Corbin, J. (1994). Grounded theory methodology: An overview. In N. Denzin & Y. Lincoln (Eds.), *Handbook of qualitative research* (1st ed.) (pp. 273–285). London, England: SAGE.
- Straussfogel, D., & Von Schilling, C. (2009). Systems theory. In R. Kitchin & N. Thrift (Eds.), *International encyclopedia of human geography* (pp. 151–158). Oxford, England: Elsevier.
- Strogatz, S. (1994). *Nonlinear Dynamics and Chaos: With applications to physics, biology, chemistry, and engineering*. Cambridge, MA: Westview Press.
- Strogatz, S. (2003). *Sync: How order emerges from chaos in the universe, nature, and daily life*. New York, NY: Hyperion.
- Stronge, J., Ward, T., & Grant, L. (2011). What makes good teachers good? A cross-case analysis of the connection between teacher effectiveness and student achievement. *Journal of Teacher Education, 62*, 339–355.
- Suddaby, R. (2006). From the editors: What grounded theory is not. *Academy of Management Journal, 49*, 633–642.
- Suls, J., & Fletcher, B. (1985). The relative efficacy of avoidant and nonavoidant coping strategies: A meta-analysis. *Health Psychology, 4*, 249–288.

- Sutton, R. (2004). Emotional regulation goals and strategies of teachers. *Social Psychology of Education, 7*, 379–398.
- Sutton, R. (2007). Teachers' anger, frustration, and self-regulation. In P. Schutz & R. Pekrun (Eds.), *Emotions in education* (pp. 259–274). San Diego, CA: Academic Press.
- Sutton, R., & Wheatley, K., (2003). Teachers' emotions and teaching: A review of the literature and directions for future research. *Educational Psychology Review, 15*, 327–358.
- Tabachnick, B., & Fidell, L. (2007). *Using multivariate statistics* (5th ed.). Pearson Education.
- Tait, M. (2008). Resilience as a contributor to novice teacher success, commitment, and retention. *Teacher Education Quarterly, 35*(4), 57–75.
- Tang, S., Cheng, M., & Cheng, A. (2014). Shifts in teaching motivation and sense of self-as-teacher in initial teacher education. *Educational Review, 66*, 465–481.
- Taris, T., Le Blanc, P., Schaufeli, W., & Schreurs, P. (2005). Are there causal relations between the dimensions of the Maslach Burnout Inventory? A review and two tests. *Work & Stress, 19*, 238–255.
- Taylor, I., Ntoumanis, N., & Standage, M. (2008). A self-determination theory approach to understanding antecedents of teachers' motivational strategies in physical education. *Journal of Sport and Exercise Psychology, 30*, 75–94.
- Thelen, E. (2005). Dynamic systems theory and the complexity of change. *Psychoanalytic Dialogues, 15*, 255–283.
- Thelen, E., & Bates, E. (2003). Connectionism and dynamic systems: Are they really different? *Developmental Science, 6*, 378–391.

- Thelen, E., & Smith, L. (1994). *A dynamic systems approach to development of cognition and action*. Cambridge, MA: MIT Press.
- Thomas, L., & Beauchamp, C. (2011). Understanding new teachers' professional identities through metaphor. *Teaching and Teacher Education, 27*, 762–769.
- Tkačik, G., & Bialek, W. (2009). Cell biology: Networks, regulation and pathways. In R. Meyers (Ed.), *Encyclopedia of complexity and systems science* (pp. 719–741). New York: Springer.
- Tobin, D., Holroyd, K., Reynolds, R., & Wigul, J. (1989). The hierarchical factor structure of the Coping Strategies Inventory. *Cognitive Therapy and Research, 13*, 343–361.
- Trent, J. (2013). From learner to teacher: Practice, language, and identity in a teaching practicum. *Asia-Pacific Journal of Teacher Education, 41*, 426–440.
- Trent, J. (2015). Towards a multifaceted, multidimensional framework for understanding teacher identity. In Y.L Cheung, S.B. Said, & K. Park (Eds.) *Advances and current trends in language teacher identity research* (pp. 44–58). New York, NY: Routledge.
- Trent, J., Gao, X., & Gu, M. (2014). *Language teacher education in a multilingual context*. New York, NY: Springer.
- Tsang, W. K. (2004). Teachers' personal practical knowledge and interactive decisions. *Language Teaching Research, 8*, 163–198.
- Tschannen–Moran, M., & Woolfolk Hoy, A. (2001). Teacher efficacy: Capturing an elusive construct. *Teaching and Teacher Education, 17*, 783–805.
- Tsui, A. (2007). Complexities of identity formation: A narrative inquiry of an EFL teacher. *TESOL Quarterly, 41*, 657–680.

- Ungar, M. (2012). Social ecologies and their contribution to resilience. In M. Ungar (Ed.), *The social ecology of resilience: A handbook of theory and practice* (pp. 13–31). New York, NY: Springer.
- Uprichard, E. (2009). Introducing cluster analysis: What can it teach us about the case? In D. Byrne & C.C. Ragin (Eds.), *The SAGE handbook of case-based methods* (pp. 132–147). Thousand Oaks, CA: SAGE.
- Uprichard, E. (2013). Sampling: Bridging probability and nonprobability designs. *International Journal of Social Research Methodology*, 16, 1–11.
- Urdan, T. (2014). Concluding commentary: Understanding teacher motivation. In P.W. Richardson, S.A. Karabenick, & H.M. Watt (Eds.), *Teacher motivation: Theory and practice* (pp. 227–246). New York, NY: Routledge.
- Urry, J. (2005). The complexity turn. *Theory, Culture and Society*, 22(5), 1–14.
- Ushioda, E. (2015). Context and complex dynamic systems theory. In Z. Dörnyei, P.D. MacIntyre, & A. Henry (Eds.), *Motivational dynamics in language learning* (pp. 47–54). Bristol, England: Multilingual Matters.
- Van der Werff, S., Van den Berg, S., Pannekoek, J., Elzinga, B., & Van der Wee, N. (2013). Neuroimaging resilience to stress: A review. *Frontiers in Behavioral Neuroscience*, 7(39), 1–32.
- van Geert, P. (1998). We almost had a great future behind us: The contribution of non-linear dynamics to developmental-science-in-the-making. *Developmental Science*, 1, 143–159.
- van Geert, P. (2008). The dynamic systems approach in the study of L1 and L2 acquisition: An introduction. *Modern Language Journal*, 92, 179–199.

- van Geert, P. (2009). Complex dynamic systems of development. In R. Meyers (Ed.), *Encyclopedia of complexity and systems science* (pp. 1872–1916). New York, NY: Springer.
- van Geert, P., & Steenbeek, H. (2005). Explaining after by before: Basic aspects of a dynamic systems approach to the study of development. *Developmental Review*, 25, 408–442.
- van Lier, L. (1988). *The classroom and the language learner*. London, England: Longman.
- Varghese, M. (2011). Language teacher education and teacher identity. In F. Hult & K. King Eds.), *Educational linguistics in practice: Applying the local globally and the global locally* (pp. 16–26). Bristol, England: Multilingual Matters.
- Varghese, M., Morgan, B., Johnston, B., & Johnson, K. (2005). Theorizing language teacher identity: Three perspectives and beyond. *Journal of Language, Identity, and Education*, 4, 21–44.
- Verspoor, M., Lowie, W., & van Dijk, M. (2008). Variability in second language development from a dynamic systems perspective. *Modern Language Journal*, 92, 214–231.
- Verspoor, M., Schmid, M., & Xu, X. (2012). A dynamic usage based perspective on L2 writing. *Journal of Second Language Writing*, 21, 239–263.
- Visser–Wijnveen, G., Stes, A., & Van Petegem, P. (2014). Clustering teachers' motivations for teaching. *Teaching in Higher Education*, 19, 644–656.
- Vogt, D., Rizvi, S., Shipherd, J., & Resick, P. (2008). Longitudinal investigation of reciprocal relationship between stress reactions and hardiness. *Personality and Social Psychology Bulletin*, 34, 61–73.

- Walby, S. (2007). Complexity Theory, systems theory, and multiple intersecting social inequalities. *Philosophy of the Social Sciences*, 37, 449–470.
- Waninge, F., Dörnyei, Z., & de Bot, K. (2014). Motivational dynamics in language learning: Change, stability, and context. *Modern Language Journal*, 98, 704–723.
- Watson, C. (2006). Narratives of practice and the construction of identity in teaching. *Teachers and Teaching: Theory and Practice*, 12, 509–526.
- Watson, D., Clark, L., & Tellegan, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54, 1063–1070.
- Watt, H. M., & Richardson, P. W. (2008). Motivations, perceptions, and aspirations concerning teaching as a career for different types of beginning teachers. *Learning and Instruction*, 18, 408–428.
- Watt, H. M., & Richardson, P. W. (2012). An introduction to teaching motivations in different countries: comparisons using the FIT-Choice scale. *Asia-Pacific Journal of Teacher Education*, 40, 185–197.
- Wang, J., Odell, S., & Schwille, S. (2008). Effects of teacher induction on beginning teachers' teaching: A critical review of the literature. *Journal of Teacher Education*, 59, 132–152.
- Wenger, E. (1998). *Communities of practice: Learning, meaning, and identity*. Cambridge, England: Cambridge University Press.
- Wentzel, K., & Brophy, J. (2014). *Motivating students to learn* (4th ed.). New York, NY: Routledge.
- Wentzel, K., & Wigfield, A. (Eds.). (2009). *Handbook of motivation at school*. New York, NY: Routledge.

- Werner, E. (1993). Risk, resilience, and recovery: Perspectives from the Kauai longitudinal study. *Development and Psychopathology*, *5*, 503–515.
- Werner, E. (1995). Resilience in development. *Current Directions in Psychological Science*, *4*(3), 81–85.
- Wheatley, K. (2005). The case for reconceptualizing teacher efficacy research. *Teaching and Teacher Education*, *21*, 747–766.
- Wheeldon, J., & Faubert, J. (2009). Framing experience: Concept maps, mind maps, and data collection in qualitative research. *International Journal of Qualitative Methods*, *8*(3), 68–83.
- Wiebe, D. (1991). Hardiness and stress moderation: A test of proposed mechanisms. *Journal of Personality and Social Psychology*, *60*, 89–99.
- Wilkes, G. (2002). Introduction: A second generation of resilience research. *Journal of Clinical Psychology*, *58*, 229–232.
- Wilkins, C., Busher, H., Kakos, M., Mohamed, C., & Smith, J. (2012). Crossing borders: new teachers co-constructing professional identity in performative times. *Professional Development in Education*, *38*, 65–77.
- Williams, P., Wiebe, D., & Smith, T. (1992). Coping processes as mediators of the relationship between hardiness and health. *Journal of Behavioral Medicine*, *15*, 237–255.
- Winograd, K. (2003). The functions of teacher emotions: The good, the bad, and the ugly. *Teachers College Record*, *105*, 1641–1673.
- Wolf–Branigin, M. (2013). *Using complexity theory for research and program evaluation*. Oxford, England: Oxford University Press.

- Woolfolk Hoy, A. (2008). Commentary: What motivates teachers? Important work on a complex question. *Learning and Instruction, 18*, 492–498.
- Woolfolk Hoy, A., Hoy, W., & Kurz, N. (2008). Teacher's academic optimism: The development and test of a new construct. *Teaching and Teacher Education, 24*, 821–835.
- Wu, G., Feder, A., Cohen, H., Kim, J., Calderon, S., Charney, D., & Mathé, A. (2013). Understanding resilience. *Frontiers in Behavioral Neuroscience, 7*(10), 1–15.
- Wyatt, M. (2013). Motivating teachers in the developing world: Insights from research with English language teachers in Oman. *Internationale Zeitschrift Für Erziehungswissenschaft, 59*, 217–242.
- Xiao, J. (2014). What do distance language tutors say about teacher motivation? *Open Learning: The Journal of Open, Distance and e-Learning, 29*, 145–159.
- Yin, R. (2012). *Applications of case study research* (3rd ed.). Thousand Oaks, CA: SAGE.
- Yin, R. (2014). *Case study research: Design and methods* (5th ed.). Thousand Oaks, CA: SAGE.
- Yin, R. (2016). *Qualitative research from start to finish* (2nd ed.). New York, NY: Guilford.
- Yuan, R., & Lee, I. (2015). The cognitive, social and emotional processes of teacher identity construction in a pre-service teacher education programme. *Research Papers in Education, 30*, 469–491.
- Zabarenko, L. (2000). Resistance. In G. Fink (Ed.), *Encyclopedia of stress* (pp. 373–375). San Diego, CA: Academic Press.

- Zapf, D., Seifert, C., Schmutte, B., Mertini, H., & Holz, M. (2001). Emotion work and job stressors and their effects on burnout. *Psychology and Health, 16*, 527–545.
- Zautra, A., Hall, J., & Murray, K., (2008). Resilience: A new integrative approach to health and mental health research. *Health Psychology Review, 2*, 41–64.
- Zee, M., & Koomen, H. (2016). Teacher self-efficacy and its effects on classroom processes, student academic adjustment, and teacher well-being: A synthesis of 40 years of research. *Review of Educational Research*.
doi:10.3102/0034654315626801
- Zembylas, M. (2003a). Caring for teacher emotion: Reflections on teacher self-development. *Studies in Philosophy & Education, 22*, 103–125.
- Zembylas, M. (2003b). Interrogating ‘teacher identity’: Emotion, resistance, and self-formation. *Educational Theory, 53*, 107–127.
- Zembylas, M. (2004). The emotional characteristics of teaching: An ethnographic study of one teacher. *Teaching and Teacher Education, 20*, 185–201.
- Zembylas, M. (2007). The power and politics of emotions in teaching. In P. Schutz & R. Pekrun (Eds.), *Emotions in education* (pp. 293–309). San Diego, CA: Academic Press.
- Zembylas, M. (2011). Teaching and teacher emotions: A post-structural perspective. In C. Day & J.C.–K. Lee (Eds.), *New understandings of teacher’s work: Emotions and educational change* (pp. 31–44). New York, NY: Springer.
- Zhang, Y. (2012). *Dynamic vocabulary development in a foreign language*. Berlin, Germany: Peter Lang.

Zorrilla, E., Derubeis, R., & Redei, E. (1995). High self-esteem, hardiness and affective stability are associated with higher basal pituitary-adrenal hormone levels.

Psychoneuroendocrinology, 20, 591–601.

Appendices

Appendix A

Consent form for Case-study Interviews

Researcher/Affiliation: Philip Hiver (PG student at the Univ. of Nottingham, UK)

Purpose: The purpose of these case-study interviews is to explore how teachers achieve a sense of stability in their careers, and how that stability might change. These interviews will include, but are not restricted to, questions about career background, teaching experiences and behaviors, opinions and feelings, successes and failures, and memories and future goals. There are no known risks involved with any of the procedures used.

Please, read the following information and select as necessary:

- YES NO I confirm that I have understood the purpose of this study.
- YES NO I understand that there are no known risks or hazards associated with participating in this study.
- YES NO I have had the opportunity to ask questions and they have been successfully answered.
- YES NO I understand that my participation in this study is voluntary and that I am free to withdraw from the study at any time and without having to give a reason.
- YES NO I understand that all data are anonymous and confidential, and that there will not be any connection between the personal information provided that might identify me in the data.
- YES NO I agree that my recorded responses, which I have given voluntarily, can be used anonymously for research purposes.
- YES NO I confirm that I have read and understood the above information and that I agree to participate in this study.

Participant's signature: _____ Date: _____

Participant's Name (in block capitals): _____

Researcher's Name (Signature): PHILIP HIVER (_____)

Appendix B

Case-study Interview Schedule

Participant	Date	Setting	Start Time / Finish Time

- The participant has had the opportunity to ask questions and they have been successfully answered: Yes / No
- The participant has read, signed, and returned the informed consent form: Yes / No

Opening Question

To begin with, tell me about how you came to be a language teacher.

Settledness

You seem to have some kind of solidness which many of your colleagues who seem to be successful don't. What's your secret? How did you get like this? Where does this peace you have as a language teacher come from?

You are one of the most gifted and competent language teachers I've seen but I see you are still growing, you haven't settled you aren't satisfied with this. Do you know this about yourself? What is it that stops you from simply sitting back and enjoying what you have achieved?

Unsettledness

What are things that sometimes cause you to lose your sanity or sense of equilibrium as a teacher?

What is something or what are some circumstances which could disrupt this harmony you have as a language teacher? Imagine that this thing happened to you. What would you do about it?

Can you imagine something which could cause you to become unsettled or that could shake you up as a language teacher and make you feel vulnerable? Imagine this thing happened to you. What would you do about it?

Reactions to Challenges

What kinds of difficulties or challenges do most language teachers experience or are they most vulnerable to?

What are some difficulties or challenges you see most language teachers face in their careers?

How do you recommend language teachers should react to difficulties or challenges they face? What are the best things they can do to hold themselves together on a bad day or when things go wrong?

How do you feel language teachers should not react to difficulties or challenges they face? What are the worst things they can do on a bad day or when things go wrong?

What helps you to keep your sanity as a language teacher?

What do you do to hold yourself together on a bad day or when things go wrong?

Interactions with Colleagues

Have you worked (or do you work) closely with other language teachers who seem really solid/settled and at peace with themselves as a teacher? Tell me about how you have interacted with these people.

Have you worked (or do you work) closely with other language teachers who seem less solid/settled and less at peace as a teacher than you are? Tell me about how you have interacted with these people.

Have you ever met a language teacher who seemed settled and confident but you thought, 'Hmm that's not right. There's something they aren't doing right and they shouldn't be so comfortable'? How do you react to that kind of person and how do you interact with them?

Have you ever met a language teacher who you knew was doing all the right things and they should have been confident and settled but they weren't? How do you react to that kind of person and how do you interact with them?

Appendix C

Consent form for Focus-group Interview

Researcher/Affiliation: Philip Hiver (PG student at the University of Nottingham, UK)

Purpose: The purpose of this focus-group interview is to explore profiles of typical language teachers within the profession. This focus-group interview may include questions about career background, teaching experiences and behaviors, opinions and feelings, successes and failures, and memories and future goals.

Please, read the following information and select as necessary:

- YES NO I confirm that the purpose of this study has been explained and that I have understood it.
- YES NO I have had the opportunity to ask questions and they have been successfully answered.
- YES NO I understand that my participation in this study is voluntary and that I am free to withdraw from the study at any time, without giving a reason and without consequence.
- YES NO I understand that all data are anonymous and that there will not be any connection between the personal information provided and the data.
- YES NO I understand that there are no known risks or hazards associated with participating in this study.
- YES NO I consent to an audio file of my participation being recorded and understand that no identifying factors will be connected with my participation.
- YES NO I consent to my data being transcribed and understand that I will be referred to anonymously.
- YES NO I consent to my data being used in the presentation of research findings, and understand that no identifying factors will be connected with my participation in this presentation of the data.
- YES NO I confirm that I have read and understood the above information and that I agree to participate in this study.

Participant's signature: _____ Date: _____

Researcher's Name (Signature): PHILIP HIVER (_____)

Appendix D

Focus-group Prompt

Have you ever met or worked closely with types of teachers who seemed to have the ability to resist difficulties they experienced and function effectively in the classroom without becoming vulnerable to problems—almost like they were immune to stress, problems, and difficulties?

If you have met these types of teachers, how would you describe:

- what these teachers *think* (e.g., their philosophy about teaching and their reasons for being a teacher)?
- how these teachers *feel* (e.g., the emotions they experience and show others as a teacher)?
- what these teachers *believe* (e.g., how they see themselves and others, and their attitudes to the world around them)?
- what these teachers *do* and why (e.g., how they act when they experience conflict or challenges in their professional life)?
- what these teachers *want* (e.g., what are their motives or desires as a teacher)?

Appendix E

Language Teacher Immunity Questionnaire

Thank you for helping to answer this online questionnaire. The purpose is to find out more about language teachers' experiences and their feelings about their work and life. It will take you about 10 minutes to complete this survey.

본 설문에 협조해주셔서 감사 드립니다. 설문을 마치는 데에는 약 10 분 정도가 소요됩니다. 본 설문은 언어 교사들의 일과 삶에 대한 그들의 경험과 신념을 파악하는 것을 목적으로 하고 있습니다.

Your answers are completely anonymous and confidential. If you decide in the end that you would prefer not to participate in this survey, you will be free to withdraw without any consequence.

본 온라인 설문은 완전하게 익명 및 기밀로 처리됩니다. 설문을 시작하였지만 마지막에 설문참가를 원치 않을 경우에는, 어떠한 문제없이 그만 두실 수 있습니다. 교사로서의 여러분 개인적인 의견을 알게 되는 것이 우리에게는 매우 중요한 일이 될 것입니다.

There are no "right" or "wrong" answers, so please give your answers sincerely. If you have any questions about this questionnaire you can contact the researcher Phil Hiver at philhiver@yahoo.com.

“옳거나”, “그른” 답변은 없습니다. 본 연구과제의 정확한 연구결과를 위해서, 성실하고 정직하게 답변해주시길 부탁드립니다. 본 설문지에 관해 궁금한 점이 있으시면 Phil Hiver (philhiver@yahoo.com)에게 문의해주시시오.

By submitting this questionnaire you agree that your answers, which you have given voluntarily, can be used anonymously for research purposes.

본 설문을 완료하는 것으로, 나는 내가 자발적으로 한 답변들이 연구의 목적으로 익명 하에 사용됨에 동의합니다.

Thank you very much for your time and support.

시간을 내서 본 연구에 참여해 주신 점 대단히 감사 드립니다.

We would like you to answer how much you agree or disagree with the following statements by choosing a number from 1 (strongly disagree) to 6 (strongly agree). Please do not leave out any items.

본 설문지의 각 문항에는 1(전혀 동의하지 않음)에서 6(매우 동의함)까지 6개의 가능한 답변이 제시됩니다. 각 문항마다 여러분의 생각을 가장 잘 표현한 진술에 표시해주시오.

Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree
전혀 동의하지 않음	동의하지 않음	약간 동의하지 않음	약간 동의함	동의함	매우 동의함
1	2	3	4	5	6

Example. If you strongly agree with the following statement, write this:	Your Opinion
I like coffee very much.	1 2 3 4 5 6

1.	As a teacher, I prefer the familiar to the unknown. 교사로서, 나는 생소한 것보다 익숙한 것을 선호한다.	1	2	3	4	5	6
2.	I regularly feel inspired at school or in the classroom. 나는 학교 또는 교실에서 자주 영감을 받는다.	1	2	3	4	5	6
3.	When problems arise at work, I accept what has happened and learn to live with it. 직장에서 문제가 발생할 때, 나는 일어난 일을 받아들이고 대처한다.	1	2	3	4	5	6
4.	I have confidence in my professional ability to help students learn. 나는 학생들의 학습에 도움을 주는 나의 직업적 능력에 자신감을 가지고 있다.	1	2	3	4	5	6
5.	When I am under a lot of stress, I just avoid thinking or doing anything about the situation. 나는 스트레스를 많이 받으면, 그 상황에 대한 어떠한 생각이나 행동도 회피해버린다.	1	2	3	4	5	6

6.	I tend to bounce back quickly after hard times. 나는 힘든 시기로부터 빨리 회복하는 편이다.	1	2	3	4	5	6
7.	I feel I am positively influencing my students' lives through my teaching. 나는 나의 가르침을 통해 내 학생들의 삶에 긍정적 영향을 미치고 있다고 느낀다.	1	2	3	4	5	6
8.	I have enough training and experience to deal with almost any learning problem in the classroom. 나는 교실 내에서 일어나는 거의 모든 학습 문제를 다룰 수 있는 충분한 훈련 및 경험을 가지고 있다.	1	2	3	4	5	6
9.	The "tried and true" ways of teaching are the best. "기존의" 교수법이 최고이다.	1	2	3	4	5	6
10.	When things get really stressful, I try to come up with a strategy about what to do. 나는 정말 스트레스를 받는 상황이 될 때, 무엇을 해야 할지 전략을 생각해내려 노력한다.	1	2	3	4	5	6
11.	At school or in the classroom I often feel upset. 나는 학교 또는 교실에서 자주 화가 난다.	1	2	3	4	5	6
12.	I am emotionally drained by teaching. 가르치는 일은 나를 감정적으로 고갈시킨다.	1	2	3	4	5	6
13.	Overall, I expect more good things to happen to me in the classroom than bad. 전반적으로, 나는 교실에서 나에게 나쁜 일보다는 좋은 일이 더 많이 일어날 것을 기대한다.	1	2	3	4	5	6
14.	Teaching brings me very little satisfaction. 가르치는 일은 나에게 매우 낮은 만족감을 준다.	1	2	3	4	5	6
15.	There are days when I feel insecure at school. 나는 학교에서 불안감을 느끼는 날들이 있다.	1	2	3	4	5	6
16.	If I really try hard, I can get through to even the most difficult or unmotivated students. 내가 정말 열심히 노력한다면, 나는 가장 말썽을 부리거나 동기부여가 되지 않은 학생들조차 명확하게 이해시킬 수 있다.	1	2	3	4	5	6
17.	I am tempted to leave the teaching profession.	1	2	3	4	5	6

	나는 가르치는 직업을 그만두고 싶은 유혹을 받는다.						
18.	While teaching I regularly feel depressed. 나는 가르치는 동안 우울함을 자주 느낀다.	1	2	3	4	5	6
19.	Teaching is my life and I can't imagine giving it up. 교직은 내 삶이며, 교직을 포기하는 것은 상상조차 할 수 없다.	1	2	3	4	5	6
20.	I am not certain that I am making a difference in the lives of my students. 나는 내가 나의 학생들의 삶에 변화를 주고 있는지 확신하지 않는다.	1	2	3	4	5	6
21.	I feel that I can deal with whatever comes my way. 나는 나에게 어떤 일이 일어나든 그 일에 대처할 수 있다고 느낀다.	1	2	3	4	5	6
22.	At school I feel burned out from my work. 나는 학교에서 내 일에 대해 지쳤다고 느낀다.	1	2	3	4	5	6
23.	I always look on the bright side of things. 나는 항상 낙관적으로 생각한다.	1	2	3	4	5	6
24.	I get frustrated when my work is unfamiliar and outside my comfort zone as a teacher. 나는 나의 일이 익숙하지 않고 교사로서의 편안함을 느끼는 상황을 벗어나 있을 때 좌절감을 느낀다.	1	2	3	4	5	6
25.	Trying my best in the classroom really pays off in the end. 나는 교실에서 나의 최선을 다하면 결국에는 원하는 성과를 꼭 거둔다.	1	2	3	4	5	6
26.	I deal effectively with the problems of my students. 나는 내 학생들의 문제를 효과적으로 다룬다.	1	2	3	4	5	6
27.	I get impatient when there are no clear answers or solutions to my problems as a teacher. 나는 교사로서의 내 문제에 대한 명확한 답이나 해결책이 없을 때 초조해진다.	1	2	3	4	5	6
28.	I can get through difficult times because I've experienced difficulty before. 나는 이전에 어려움을 경험했었기 때문에 어려운 시기도 지나올 수 있다.	1	2	3	4	5	6

	If I could choose an occupation today, I would not choose to be a teacher.								
29.	내가 지금 직업을 선택할 수 있다면, 교사가 되는 것은 선택하지 않을 것이다.	1	2	3	4	5	6		
	When all factors are considered, I am a powerful influence on my students' success in the classroom.								
30.	모든 요소들을 고려했을 때, 나는 교실 안에서 내 학생들의 성공에 강력한 영향을 미친다.	1	2	3	4	5	6		
	I have a hard time making it through stressful events.								
31.	나는 스트레스가 큰 사건들을 이겨내기가 어렵다.	1	2	3	4	5	6		
	I like it when things are uncertain or unpredictable.								
32.	나는 불확실하고 예측 불가능한 상황들을 좋아한다.	1	2	3	4	5	6		
	I find it hard to give up on something that has worked for me in the past, even if it is no longer very successful.								
33.	이제는 더 이상 꽤 성공적이지 않더라도, 나는 지금까지 내가 오랫동안 해 왔던 방식들을 포기하기가 어렵다.	1	2	3	4	5	6		
	I feel that teaching is hardening me emotionally.								
34.	나는 가르치는 일이 나를 감정적으로 둔감하게 만든다고 느낀다.	1	2	3	4	5	6		
	I hardly ever expect things to go my way at work.								
35.	나는 직장에서 일이 내 뜻대로 되는 것을 거의 기대하지 않는다.	1	2	3	4	5	6		
	It is hard for me to recover when something bad happens.								
36.	나는 뭔가 나쁜 일이 일어났을 때 회복하기가 힘들다.	1	2	3	4	5	6		
	There are days at school when I feel vulnerable.								
37.	학교에서 내가 취약하게 느껴지는 날들이 있다.	1	2	3	4	5	6		
	When I encounter a bad situation at school, I look for something good in what is happening.								
38.	나는 학교에서 나쁜 상황에 맞닥뜨렸을 때, 그 상황 속에서도 뭔가 좋은 점을 찾는다.	1	2	3	4	5	6		
	I enjoy working as a teacher because it brings me pleasure.								
39.	내가 교사로 일하기를 즐기는 이유는 그것이 내게 기쁨을 주기 때문이다.	1	2	3	4	5	6		

Appendix F

Consent form for In-depth Interviews

Researcher/Affiliation: Philip Hiver (PG student at the University of Nottingham, UK)

Purpose: The purpose of these multi-session interviews is to explore what factors have contributed to teachers' current state in the profession. These interviews may include questions about career background, teaching experiences and behaviors, opinions and feelings, successes and failures, and memories and future goals.

Please, read the following information and select as necessary:

- YES NO I confirm that the purpose of this study has been explained and that I have understood it.
- YES NO I have had the opportunity to ask questions and they have been successfully answered.
- YES NO I understand that my participation in this study is voluntary and that I am free to withdraw from the study at any time, without giving a reason and without consequence.
- YES NO I understand that all data are anonymous and that there will not be any connection between the personal information provided and the data.
- YES NO I understand that there are no known risks or hazards associated with participating in this study.
- YES NO I consent to an audio file of my participation being recorded and understand that no identifying factors will be connected with my participation.
- YES NO I consent to my data being transcribed and understand that I will be referred to anonymously.
- YES NO I consent to my data being used in the presentation of research findings, and understand that no identifying factors will be connected with my participation in this presentation of the data.
- YES NO I confirm that I have read and understood the above information and that I agree to participate in this study.

Participant's signature: _____ Date: _____

Researcher's Name (Signature): PHILIP HIVER (_____)

Appendix G

In-depth Interview Schedule

Interview 1 Aim: *to identify factors that have contributed to respondents' current teacher immunity archetype.*

Participant	Date	Setting	Start Time / Finish Time

- The participant has had the opportunity to ask questions and they have been successfully answered: Yes / No
- The participant has read, signed, and returned the informed consent form: Yes / No
- The participant has requested a recording/transcript of the interview: Yes / No
- The participant has requested a summary of the research: Yes / No

1.1 To begin with, could you tell me about how you came to be a teacher?

1.2 If I ask you to divide your career so far into major stages, can you do that and tell me about each stage?

1.3 Now, can you tell me a story from each stage that will explain a bit more what you were experiencing?

1.4 Can you think of one or two major events in your career that have shaped who you are as a teacher? What were the events? How did they influence you?

1.5 Can you think of one or two major individuals in your career that have shaped who you are as a teacher? Who were the people? How did they influence you?

1.6 Can you think of a time when you did something that helped define you as a teacher? What was the situation?

Interview 2 Aim: *to identify how respective language teacher immunity archetypes influence teacher identity and self-concept.*

Participant	Date	Setting	Start Time / Finish Time

2.1 What does it mean to you to be a teacher? Why?

2.2 What are some of the key things someone needs to know to understand you as a teacher?

2.3 As a teacher, how are you similar or different now compared to when you just began teaching?

2.4 In what ways do you feel that being a teacher is or is not part of your identity? Can you think of a time / example when you did something that showed this?

2.5 I've seen so many teachers struggling in their careers, what do you think are the keys or secrets to long term success as a teacher.

2.6 Imagine that you could wave a magic wand and change something about yourself as teacher. Would you change anything about yourself, and if so, what?

Interview 3 Aim: *to identify how language teacher immunity archetypes manifest themselves in teachers' motivated behavior.*

Participant	Date	Setting	Start Time / Finish Time

3.1 Can you describe your typical classroom to me? What happens in your typical classroom?

3.2 Can you tell me about one of your most memorable classes?

3.3 Can you describe a perfect classroom to me? What would your perfect classroom be like?

3.4 What advice would you give someone who is thinking about becoming a teacher?

3.5 If I ask you to think or project ahead into the future, what are some major stages you see in your future career?

3.6 Earlier we talked about how you have become who you are. Thinking ahead, how do you think you will change in the future as a teacher?