

Implicit Attitudes in Language Learning

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Abstract

The field of language motivation is almost 60 years old. Throughout these decades, one idea has been persistent: Motivation is assumed to be a conscious process on which the learner can exert direct control. That this conscious conceptualization might not give the full picture has not been seriously entertained. An important consequence ensuing from this approach is the overreliance on self-report measures, such as questionnaires and interviews. Thus, in effect, the individual's conscious reflection on their own attitudes and motivation has been the primary source of empirical data for our field.

This thesis challenges this hegemony of conscious motivation. It provides an extensive review of the various paradigms of unconscious attitudes and motivation. It traces back their origins, highlights some of their major findings, and reviews the instruments used within each paradigm to circumvent direct self-report (as well as the controversies surrounding these instruments). The review also demonstrates that the adoption of an unconscious perspective is not inconsistent with major theoretical frameworks in the field. It then selects one of these paradigms, namely implicit attitudes, to apply in the context of language learning.

Two studies were conducted on two independent samples (with almost 700 participants in total), in two different contexts (the UK and Saudi Arabia), and with different instruments of implicit attitudes (the Implicit Association Test and the Single-Target Implicit Association Test). Study 1 found that openness to language speakers at the implicit level is associated with more openness at the explicit level. Study 2 successfully replicated this finding, and extended it to language achievement—showing that learners with more favorable attitudes toward language speakers at the implicit level achieved higher grades in their English class. This finding could not be explained away by either social desirability or cognitive confounds. The results from these two studies were also meta-analyzed using Bayes factors in order to give an overall picture of the findings.

The Discussion chapter wraps up this thesis by highlighting the relevance of this unconscious approach to the field more broadly. This chapter reviews a number of recent studies that have yielded similar findings to those from the current thesis. Some of these findings are then critically reanalyzed and reinterpreted in the context of unconscious motivation, thus demonstrating how adopting an unconscious approach helps view existing findings in a new light. In some cases, the analysis casts doubt on established ideas that have been taken for granted for decades.

The overall message of this thesis is not that conscious motivation should be disregarded. Instead, conscious motivation should be complemented with a consideration of the role of unconscious motivation. A conscious-only approach would offer a limited window into human attitudes and motivation.

Publications

Items with an asterisk indicate work resulting from this thesis.

Journal articles and book chapters

- *Al-Hoorie, A. H. (2015). Human agency: Does the beach ball have free will? In Z. Dörnyei, P. MacIntyre, & A. Henry (Eds.), *Motivational Dynamics in Language Learning* (pp. 55–72). Bristol, UK: Multilingual Matters.
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Conference presentations

- *Al-Hoorie, A. H. (2014, March). *Individual- vs. group-based research: Bridging the gap*. Paper presented at the University of Birmingham English Language Postgraduate Conference (BELP), Birmingham, UK.
- *Al-Hoorie, A. H. (2014, August). *Implicit attitudes in language learning*. Paper presented at the International Conference on Motivational Dynamics and Second Language Acquisition, Nottingham, UK.
- Al-Hoorie, A. H. (2015, January). *Generalizability of integrative motivation to Saudi students*. Paper presented at the 8th Saudi Student Conference (SSC8), London, UK.
- *Al-Hoorie, A. H. (2015, June). *Implicit attitudes toward L2 speakers*. Paper presented at the New Directions in Implicit and Explicit Language Learning conference, Lancaster, UK.
- *Al-Hoorie, A. H. (2015, September). *Unconscious attitudes toward L2 native speakers*. Paper presented at the British Association for Applied Linguistics (BAAL), Birmingham, UK.
- *Al-Hoorie, A. H. (2016, January). *Can you be prejudiced against your own students: Teacher's unconscious bias in the classroom*. Paper presented at the IAFOR International Conference on Language Learning, Hawaii, USA.
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- *Al-Hoorie, A. H. (2016, April). *Prejudiced against your own students? Teacher's unconscious bias*. Paper presented at the International IATEFL Conference, Birmingham, UK.
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conference Individuals in Contexts: Psychology of Language Learning 2, Jyväskylä, Finland.

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Courses

R Programming, June 2014. A four-week online non-credit course authorized by Johns Hopkins University and offered through Coursera.

Measurement Models, 12–13 February 2015 at the University of Nottingham. A two-day intensive workshop provided by the ESRC Doctoral Training Centre in the Social Sciences.

Mathematics for Social Sciences (1A, 2A, & 3A), 13 July–21 August 2015 at Essex Summer School. A 45-hour course on algebra, trigonometry, and calculus.

Applying Regression, 13 July–21 August 2015 at Essex Summer School. A 35-hour intermediate course.

Causal Models and Structural Equations, 27 July–7 2015 August at Essex Summer School. A 35-hour advanced course.

Bayesian Analysis in the Social Sciences, 4–15 August 2015 at Essex Summer School. A 35-hour advanced course.

Methods for Causal Inference, 10–21 August 2015 at Essex Summer School. A 35-hour advanced course.

Rasch Analysis, 9–18 September 2015 at the University of Leeds. A 3-part course provided by the Psychometric Laboratory for Health Sciences. Includes a brief introduction to modern test theory and a basic introduction to Rasch Analysis (Introductory, 20 hours); analysis of Item Banking procedures, complex data including pooling data from international studies, and writing Rasch-based papers (Intermediate, 20 hours); and application of Rasch analytic procedures and informative simulation of data (Advanced, 16 hours).

Introduction to Bayesian Statistics, 15 January–12 February 2016. A four-week online course provided by the Institute for Statistics Education (Statistics.com).

IRT and CAT with Concerto, 20–22 January 2016 at the University of Cambridge. An intensive workshop provided by the Psychometrics Centre. Includes an overview of Item Response Theory and computerized adaptive testing using R.

Structural Equation Modelling, 17–18 March 2016 at the University of Nottingham. A two-day intensive workshop provided by the ESRC Doctoral Training Centre in the Social Sciences.

Meta-Analysis, April 2016. A four-week online course provided by the Institute for Statistics Education (Statistics.com).

Meta-Analysis: Concepts and Applications, 16–18 May 2016. A three-day course presented by Biostat, Inc. in London, UK.

Introduction to Multilevel Models with Applications, 11–22 July 2016 at Essex Summer School. A 35-hour advanced course.

Quantitative Data Analysis with R, 25 July–5 August 2016 at Essex Summer School. A 35-hour advanced course.

Introduction to Classical and Rasch Measurement Theories, August–November 2016. A four-month online course offered by the University Western Australia on analyzing attainment test and questionnaires using the Rasch models of modern test theory. It also includes an introduction to traditional test theory and the use of modern interactive software (RUMM).

Structural Equation Modeling with *Mplus*, 26 September–2 October 2016 at the University of Cambridge. A 6-day course on various aspects of structural equation modeling, including multiple-group analysis, multilevel modeling, and individual- and group-based trajectories in longitudinal data.

Advanced Rasch Analysis, 6–7 October 2016 at the University of Leeds. A 16-hour workshop involving application of Rasch analytic procedures and informative simulation of data.

Introduction to Multilevel Modelling Using MLwiN, 4–6 January 2017 at the University of Bristol. A workshop on multilevel modelling for continuous and binary responses (dependent or outcome variables) when the data are clustered or hierarchical, including longitudinal data.

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Chapter 1: Introduction

All our science, measured against reality, is primitive and childlike –
and yet it is the most precious thing we have
—Albert Einstein

In 2013, Ema Ushioda noted that “the unquestioned importance ascribed to English in global, national and educational policy terms does not simply translate into unquestioned positive motivation for learners of English” (Ushioda, 2013, p. 233). The recognition of the importance of Global English reflects the conscious level. The overarching goal of this thesis is to examine whether adopting an unconscious/implicit motivation perspective helps solve one piece of the puzzle described by Ushioda. More specifically, it is possible to hypothesize that some learners might harbor an unfavorable implicit attitude (despite a favorable explicit attitude) toward the language or its speakers, and that this implicit attitude might be a predictive factor of their motivation (or lack thereof) to learn the language and their eventual success in it. Because this question has not been addressed in the field, this thesis aims to fill this gap.

1.1 Overview of this thesis

Chapter 1 poses a very important question: Do we have free will? This is a fundamental question that every motivation researcher has to consider. Depending on whether it turns out that motivation is under or outside the individual’s control, a radical shift in theoretical and operational considerations must be made to accommodate this outlook. In an attempt to address this admittedly thorny question, Chapter 1 reviews evidence from a wide range of the human sciences, and concludes that the control individuals have over their motivation and behavior is much more limited than one might intuitively presume at first. Instead, the emerging picture points to a more indirect level of control. That is, a great deal of human behavior is caused by unconscious impulses, and the role of conscious thought is rather to restrain or redirect these impulses. This has led some researchers to dub this process as ‘free won’t’.

Chapter 2 narrows down the scope of the review from the human sciences in general to the language motivation field in particular. It reviews the three phases that the language

motivation has passed through, and then focuses on various emerging themes. This chapter demonstrates that adopting an unconscious perspective is not inconsistent with major theoretical frameworks in the field. It is also shown that although theorizing in our field has not addressed unconscious motivation explicitly, major theoretical frameworks actually have an indispensable unconscious component. If anything, current language motivation theories are not doing justice to the potential of their own theoretical frameworks.

Chapter 3 narrows the scope even further to focus specifically on unconscious attitudes and motivation. This chapter offers an extensive review of major paradigms that have investigated unconscious attitudes and motivation. Each paradigm is reviewed in detail, highlighting its history, major findings, and controversies surrounding it. Chapter 4 then zooms in on implicit instruments. It reviews various traditional and modern instruments that have been devised to avoid the reliance on direct self-report. This chapter details operational, practical, and statistical considerations for each of these instruments.

Chapter 5 presents the empirical studies of this thesis. Two studies, with almost 700 participants in total, were conducted in the UK and in Saudi Arabia. The two studies also utilized two established measures of implicit attitudes: the Implicit Association Test and the Single-Target Implicit Association Test. Overall, the results show that learners with favorable implicit attitudes toward language speakers show more openness toward language speakers and achieve higher grades in the English class. The results of the two studies were also meta-analyzed in order to offer a more integrative picture of the findings. Chapter 6 finally links the approach adopted in this thesis and its findings to the field more broadly. This chapter demonstrates that adopting an unconscious motivation perspective can have important implications to the field as a whole. This, in turn, underscores the critical need to broaden the scope of our field to encompass unconscious attitudes and motivation.

The above brief overview reveals the logic behind the structure of this thesis. The first chapters become successively narrower in scope until the two empirical studies. In the last chapter, the discussion becomes broader again in order to consider the implications of this research to the field as a whole. Figure 1.1 offers a visual illustration of this funnel-like structure.

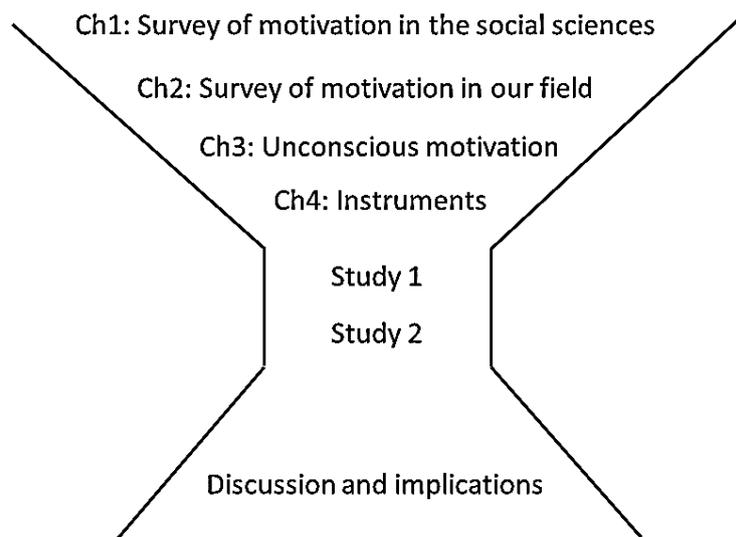


Figure 1.1: Overview of the chapters of this thesis.

This brief overview also points to what is unique about this thesis. It adopts an interdisciplinary approach, drawing from various disciplines that have informed our understanding of human behavior and motivation. In fact, the thesis has drawn from almost 700 references, a substantial proportion of which come from outside our field. Transcending the narrow disciplinary boundaries has led this thesis to also discuss rather unconventional topics, including weighing in on some pressing contemporary affairs including intergroup intolerance and global terrorism.

The design of the two empirical studies has incorporated a number of features to protect against some methodological limitations. As detailed in this thesis, these features include focusing on explicit–implicit congruence rather than just implicit attitudes, validation with cluster analysis, replication with a different sample in a different context with a different implicit instrument, extending the results to achievement rather than relying on intended effort as an outcome variable, using social desirability as an explicit control, and using an additional measure as an implicit control. All these steps were taken to bolster confidence in the conclusions derived from this thesis.

The analysis of the data also drew from a myriad of statistical procedures, including Cronbach’s alpha, *rho*, Mokken scaling analysis, confirmatory factor analysis, chi-squared, *t*-tests, correlations, Fisher’s *r*-to-*z* transformation, hierarchical linear regression, structural equation modeling, cluster analysis, MANCOVA, Bayes factors, and sensitivity analysis. A

number of software packages were also used, including SPSS, Amos, MSP5, R, and Excel. This thesis has also generated numerous journal articles, book chapters, and presentations in international conferences held in various parts of the world.

The above brief overview also hints to the philosophy of research adopted in this thesis. The next section spells out this philosophy more explicitly.

1.2 Philosophy of this thesis

Generally speaking, the philosophy of academic research is discussed in terms of four levels: ontology, epistemology, methodology, and method. Each of these concepts is explained briefly next in order to place the present research in context. This discussion draws mainly from Ladyman (2007, see also O’Gorman & MacIntosh, 2015; Okasha, 2002, for more accessible summaries).

First, *ontology* refers to the question whether there is a reality out there to be discovered independently of our perception and comprehension of it. Objectivist philosophers maintain that there is a reality out there, and so the researcher’s job is to uncover generalizable facts and principles about this reality, and to demonstrate that these are robust and replicable. This is the ontological position adopted in this chapter. Social constructivist philosophers, on the other hand, contend that truth is not mind-independent, and that ‘epistemic authorities’ are the ones who subjectively determine what constitutes true and false beliefs. Some qualitative researchers already acknowledge this subjective feature in their research tradition. According to Lincoln and Guba,

The “realities” taken to exist depend on a transaction between the knower and the “to-be-known” in the particular context in which the encounter between them takes place. That transaction is necessarily highly subjective, mediated by the knower’s prior experience and knowledge, by political and social status, by gender, by race, class, sexual orientation, nationality, by personal and cultural values, and by the knower’s interpretation (construction) of the contextual surround. Knowledge is not “discovered” but rather *created*; it exists only in the time/space framework in which it is generated. (Lincoln & Guba, 2013, p. 40, original emphasis)

This perspective might lead one to the view that “the Special Theory of Relativity is true because those in the scientific establishment who advocated it overcame the opposition from those who denied it” (Ladyman, 2007, p. 307). Although it is hardly questionable that

subjective perception can shape reality (e.g., self-fulfilling prophecies, see Chapter 5), it seems rather extreme to posit that there is no reality out there at all.

Second, *epistemology* has to do with how to obtain knowledge of the world. Those who adopt an objectivist ontology tend to favor positivism, the belief that valid knowledge can be verified by subjecting observable (rather than metaphysical) entities to empirical investigation. Those who adopt social constructivist ontology tend to favor interpretivism, the belief that researchers should analyze how individuals make sense of their world through socialization processes. A more moderate position was advanced by Karl Popper (e.g., 1983, 2002/1934), who argued that theories cannot be verified but only falsified. Positive results do not prove the theory, but only make it ‘empirically adequate’ (van Fraassen, 1980). This position came to be known as post-positivism (for an application in educational research, see Phillips & Burbules, 2000). Another moderate position is critical realism (Bhaskar, 1989), which admits both that there is a reality out there and that our access to that knowledge might be limited by our ability to perceive it. Groff (2004) argues that critical realism goes beyond post-positivism. Critical realism is also the position held by many complexity theorists who maintain that the purpose of social research is to uncover causal mechanisms in order to arrive at generalizable claims. In the words of David D. Byrne (2009), “the central project of any science is the elucidation of causes that extend beyond the unique specific instance” (p. 1). Critical realism is the epistemological position adopted in the chapter; the main finding related to explicit–implicit congruence was examined in a difference sample in a different context in order to find out whether the results are unique to one sample or generalizable to others as well.

Third, *methodology* has to do with the systematic approach to collecting data. Objectivists generally follow the hypothetico-deductive model, in which researchers test specific hypotheses typically quantitatively. This is the approach adopted here; specific research questions were derived from the literature in order to test specific predictions in the context of language learning. Many social constructivists on the other hand prefer to follow an opposite model, using an inductive approach to develop theories and understanding of the world. Finally, *method* has to do with the specific techniques used to collect data. The two studies of this thesis used questionnaires involving several Likert and semantic differential scales, as well as two reaction-time measures of implicit attitudes.

Chapter 2: Motivation across the Social Sciences¹

The only true wisdom is in knowing you know nothing
—Socrates

2.1 Introduction

The fundamental difference between the hard sciences and the social sciences may not lie in the complexity of the latter, since it is possible to conceive of immensely complex situations in the hard sciences as well. Instead, the uniqueness of the social sciences might lie in people's ability to choose how to behave. Particles and molecules do not make choices; their behavior is predetermined and predictable by physical and chemical laws. That such precise predictability is absent in human behavior constitutes a strong argument for our ability to exercise free will through rational thought. In fact, it is the human ability to think and make rational choices that underlies ethical and moral judgments, for example deeming humans worthy of praise and reward for good behavior, and answerable for wrongdoing.

As intuitive as it might be, the above reasoning has not gone unchallenged over the years. On the one hand, advances in quantum mechanics show that precise prediction is not possible *even in principle*. The position and the momentum of a particle, for example, cannot be precisely determined simultaneously; the more precisely one is known, the less precisely the other can be determined. On the other hand, several studies have questioned the extent to which humans are in control of their actions and thoughts. As a preliminary illustration, one of the most striking findings in this respect comes from neuroscience, where research shows that the outcome of a decision could be detected in brain activity up to ten seconds before it entered awareness, suggesting that it might be possible to predict people's behavior prior to their conscious decision to behave (Soon, Brass, Heinze, & Haynes, 2008). Findings in a number of different paradigms have pointed to similar conclusions, leading some scholars to view our free will as a mere illusion (e.g., Wegner, 2002) and our behavior as largely determined by unconscious, automatic processes not by our conscious deliberation (e.g., Bargh & Williams, 2006). Other researchers have attempted to combine quantum indeterminacy with social sciences to account for human free will (Glimcher, 2005; Kane,

¹ A version of this chapter has appeared in Al-Hoorie (2015).

1996). The applicability of insights from quantum mechanics to our behavior is however disputed (Juarrero, 1999; Lau, 2009; Nahmias, 2010).

Any motivation researcher has to ask the question whether individuals have free will or not. If the person does not have much control over his/her behavior, how much confidence can we place on data obtained from self-reports? Considering that questionnaires and interviews are predominant in the field (Ushioda, 2013), this question becomes even more urgent. Complexity theory (e.g., Larsen-Freeman & Cameron, 2008) raises interesting questions regarding agency and whether the individual is capable of exercising free will by choosing how to behave. This is because one of the most common metaphors in complexity nomenclature is ‘the beach ball’, which suggests that the behavior of the individual tends to be a function of the terrain and its attractors, thus controlled by external factors. The beach ball does not have free will. Because multiple, combined and integrated forces constantly affect behavior, making it almost never in equilibrium, it is easy to overlook the ‘agent’ and whether one can be in charge of his/her own behavior. This reinforces the beach-ball view of the individual. Although few researchers in the field would explicitly embrace such a deterministic view, clearly this question has not received due attention. Every motivation researcher should ask this important question.

Looking at the literature in general, scholars tend to agree on general principles on the relationship between the individual and the environment; beyond that, the issue is “oddly divisive” (Dörnyei, 2009a, p. 236). As an illustration, Larsen-Freeman and Cameron (2008, p. 76) conclude that “it remains to some extent an open question as to how far complexity theory can accommodate deliberate decision-making.” Indeed, complexity theory has made substantial strides in analyzing the terrain of the system and its attractors, with much more work to be done to consider extent to which behavior is governed by the various system parameters and attractors. After all, the ultimate goal is not merely to describe the terrain features but to understand their effect on behavior. In Albert Bandura’s (1997, p. 7) words, “Agency causation involves the ability to behave differently from what environmental forces dictate rather than inevitably yield to them.”

The question of human agency and free will has been the subject of bitter debates and sharp disputes, stimulating the thought of intellectuals belonging to diverse disciplines including Albert Einstein, Samuel Johnson, Immanuel Kant, John Stuart Mill, Jean-Paul Sartre and Percy Bysshe Shelley. The purpose of this chapter is to build on Larsen-Freeman and Cameron’s (2008) discussion of this subject by presenting an overview of a number of theoretical paradigms that have challenged the independence of human agency, followed by a

summary of the main arguments used by agency proponents in response to these challenges. The overall aim of this chapter is to establish a position on how much conscious control the individual has on his/her motivation, in order to set the scene for the following chapters.

2.2 Agency under attack

2.2.1 Early challenges

In modern science, probably the first attempt to strip from humans the agency of their rational thought is represented in the *psychodynamic paradigm*. Sigmund Freud is credited to be the first scientist to offer a systematic analysis of unconscious motives (see Ellenberger, 1970, for a historical overview) and to conclude that the conflict between conscious and unconscious is not exclusive to those suffering from mental illness but a general structure of the human mind, and that only a minority of our actions are based on rational thought (cf. Rennison, 2001). Many critics disapproved of Freud's theory because it was considered an 'insult' to deeply held beliefs about the self and reason, a standpoint that Freud himself acknowledged but interpreted as 'resistance' and another defense mechanism not to accept this embarrassing truth (P. A. Robinson, 1993). According to the psychodynamic view, our conscious mind is only the tip of the iceberg, and our behavior is primarily motivated by early childhood experiences that lead to an unconscious battle between the id, ego and super-ego, a battle fueled by the pleasure, the reality and later the death principles (Heller, 2005; Thurschwell, 2000). It is worth noting, though, that at the heart of the psychodynamic paradigm is the fundamental assumption that we *can* exercise control over our behavior, albeit indirectly, through the tools of psychoanalysis, such as studying dreams, free associations, and Freudian slips (N. Sherman, 2000).

Psychoanalysis was replaced by the positivist empiricism of the *behavioristic paradigm*. Following David Hume's (1711/1748) emphasis on the external nature of constant conjunction, John B. Watson's methodological behaviorism rejected inner life because it is not directly observable and requires the unreliable method of introspection (Watson, 1913). B. F. Skinner's radical behaviorism went one step further by contending that the mind was no more than an imaginary invention, like all cognitive constructs such as thinking, intention, and knowledge (Skinner, 1961). Our phenomenological feelings were interpreted as "collateral effects of the causes" (Skinner, 1989, p. 18), mere by-products of three kinds of selection by consequences: natural selection (genes), operant conditioning (reinforcement) and the social environment (Skinner, 1981). In his reply to Chomsky's (1959) review of

Verbal Behavior (Skinner, 1957), Skinner (1972) claimed that creativity, whether in generative grammar or in poetry, is no more remarkable or less inevitable than a hen laying an egg!² The belief that humans control their behavior was compared to the belief that the wind controls its movement or that the farmer controls which type of fruit the plant will produce (Skinner, 1978). Skinner opposed the agentic mind so forcefully that, in a speech just one day before his death, he equated the effect of cognitive science on psychology with that of creationism on science (Skinner, 1990). Skinner also accepted all corollaries of his position, rejecting free will, punishment for transgressions, and even human dignity (Skinner, 1973).

2.2.2. *Modern challenges*

Today, the assumptions of Freud and Skinner that challenge our agency still persist in various guises. One is the *behavior genetic paradigm*, first systematically utilized in 1875 by Sir Francis Galton (Burbridge, 2001). The most powerful design to extract genetic influences is ‘twins-reared-apart’ comparisons, limitations of which are compensated for by ‘adoptees-reared-together’ comparisons to examine environmental effects in the absence of genetic similarity and by non-human selective breeding to allow for randomization (Plomin, 1990; Plomin, deFries, McClearn, & McGuffin, 2001). In 1979, the Minnesota Study of Identical Twins Reared Apart was initiated (see Segal, 2012) and found that “genetic variation is an important feature of virtually every human psychological trait” (Bouchard, 2008, p. 69). According to Bouchard (2004), heredity accounts for a substantial proportion of the variation in key human attributes such as mental ability (around 80%), personality (40–50%), psychological interests (36%) and social attitudes (65% for males and 45% for females), religiosity (30–45%), and psychiatric illnesses including Schizophrenia (80%), depression (40%), alcoholism (50–60%), and antisocial behavior (41–46%). Environmental influences play a far smaller role, sometimes even decreasing with age. Although genetic influences do not usually account for more than 50% of the variance (Plomin, 1990), this magnitude is still remarkable considering that it constitutes a *single source* (Bouchard & McGue, 2003), thus leaving all other influences to share the remaining variance. These results support Skinner’s argument that a substantial proportion of our behavior is shaped by natural selection.

² In explaining his late reply, Skinner (1972, pp. 345–346) stated, “Let me tell you about Chomsky. I published *Verbal Behavior* in 1957. In 1958 I received a 55-page typewritten review by someone I had never heard of named Noam Chomsky. I read half a dozen pages, saw that it missed the point of my book, and went no further. In 1959, I received a reprint from the journal *Language*. It was the review I had seen, now reduced to 32 pages in type, and again I put it aside. But then, of course, Chomsky’s star began to rise....”

Further support to Skinner's theory comes from the *sociological paradigm*, specifically from the structure vs. agency debate in sociology. In one extreme, Emile Durkheim (Durkheim & Lukes, 1982/1895) challenged Karl Marx's philosophy and advocated the structuralist position that views human behavior as passively and unidirectionally determined by social structure. The other extreme, the voluntarist position, shifts the focus to the individual, construing social structure as a result of human's purposeful autonomy, a position held by Max Weber (Weber, Roth, & Wittich, 1978/1922) and recently by Baert and da Silva (2010). A compromise between these two extremes was later reached in Anthony Giddens's (1984) structuration theory and Pierre Bourdieu's (1977/1972) theory of practice. This position sees structure and agency as having a dialectical relationship in an iterative process where the system is "recursively organized" (Giddens, 1984, p. 25). In this duality of structure, agents act reflexively to three sources of constraint (and enablement) represented in ability limitations, sanctions by powerful others, and structural contexts that limit the agent's options. To draw an analogy, football players are constrained by rules but these rules also give players the freedom to compete in a fair game that does not descend into complete anarchy.

Some sociocultural theorists in the second language (L2) field have expressed similar views (e.g., Duff, 2012; Lantolf & Thorne, 2006; van Lier, 2013) while others adopted a realist position (Gao, 2010; Sealey & Carter, 2004) arguing that agency and structure are independent and that their interaction produces emergent properties. Social psychologists working within Henri Tajfel and his student John Turner's social identity theory (Tajfel & Turner, 1986) have similarly demonstrated that group affiliation has a significant impact on a wide range of issues including stereotyping and prejudice (R. Brown, 2010), crowd behavior (Reicher, 2001), attitude and attitude change (Crano & Prislin, 2008), judgment and conformity (Jetten & Hornsey, 2012), and group motivation (Hogg & Abrams, 1993; Hogg, Abrams, Otten, & Hinkle, 2004). In addition to structure and agency, psychologist Albert Bandura (1986) adds a third component in his triadic reciprocal causation model, namely behavior. In addition to influencing the environment, behavior, once it has occurred can, in turn, have an influence back on the individual. Even the story influences the storyteller (McAdams & Pals, 2006).

In other words, "there is no chance that... [our decisions] can be disconnected from the social-political-historical-moral-cultural influences of our time" (Larsen-Freeman & Cameron, 2008, p. 76). That one has to constantly navigate through all these influences indicates that human agency cannot be understood by looking into the individual but,

paradoxically, by looking into the social context (Dreier, 2008) as individuals cannot be completely autonomous (Ahearn, 2001). In fact, ‘conditioning’ is still accepted as an explanation of environmental effects by some sociologists (see Archer, 2000) and social psychologists (Bohner & Dickel, 2011), while frequency of stimulus is seen as a key determinant of L2 acquisition at all levels of analysis including phonology, morphology, syntax, discourse, and orthography (Ellis, 2002). This magnitude of environmental effects lends support to Skinner’s argument that a large extent of our behavior is shaped by the environment.

In the 1950s, the cognitive revolution supplanted behaviorism (Miller, 2003). The *cognitive paradigm* was largely inspired by Edward Chace Tolman’s (1951/1932) purposive behaviorism and was a major step in reinstating the role of mental life in human behavior. Cognitive psychology has subsequently split into two routes: the microanalysis of brain functions and the macro-analysis of the socially-situated individual’s goals, expectations and aspirations (Bandura, 2001). Proponents of both these research avenues agree that, contrary to behaviorism, external stimuli do not influence the individual *directly* but through how they are consciously perceived, thus restoring the individual’s role in the causal chain. However, new strands within cognitive psychology have started to challenge this view. Originally, Thomas Henry Huxley (2011/1894) proposed the ‘steam whistle hypothesis’, wherein behavior is caused by molecular changes in the brain while consciousness³ is a by-product of this process without causal effect. Replacing ‘conditioning’ with ‘automaticity’, but accepting internal processes, advocates of this view explicitly state that they have “reopened the behaviorists’ hypothesis that the higher order responses of the human being can be *directly* put in motion by environmental stimuli” (Bargh & Ferguson, 2000, p. 928, emphasis added). Empirical studies, utilizing conscious and unconscious priming techniques (for methodological reviews, see Bargh & Chartrand, 2000; Neely, 1991), have confirmed that situational contexts have significant unintended effects:

- cognitively, information-processing goals can be primed (e.g., memorize vs. evaluate; Chartrand & Bargh, 1996);
- affectively, primes influence enjoyment and self-determination (i.e., intrinsic vs. extrinsic; Séguin Lévesque, 1999), attitudes toward goals (Ferguson & Bargh, 2004),

³ Although they are not strictly the same, consciousness and rational thinking are treated in the same way in this context.

goal-facilitating objects (Ferguson, 2008) and goal-facilitating people (Fitzsimons & Shah, 2009), as well as affect following success and failure (Moore, Ferguson, & Chartrand, 2011) and emotion regulation during anger provocation (Mauss, Cook, & Gross, 2007);

- behaviorally, priming increases the probability of goal pursuit and effort exertion (Aarts, Custers, & Marien, 2008; Holland, Wennekers, Bijlstra, Jongenelen, & van Knippenberg, 2009) and of resumption after interruption and persistence after setbacks (Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trötschel, 2001);
- socially, automaticity extends to behavioral contagion (Chartrand & Bargh, 1999) and even moral judgment (Agerström & Björklund, 2009).

Such unconscious effects can be activated by things as simple as chair softness (Ackerman, Nocera, & Bargh, 2010) or coffee temperature (L. E. Williams & Bargh, 2008). They also occur through the same brain regions (Pessiglione et al., 2007) and working memory involvement (Hassin, 2008) as conscious effects.

In sum, automaticity is seen as “a staple and indispensable construct for the explanation and prediction of almost all psychological phenomena” (Doyen, Klein, Pichon, & Cleeremans, 2012, p. 593), estimated to be accounting for 99.44% of behavior (Bargh, 1997: 243), while consciousness has “no role” (Dijksterhuis, Chartrand, & Aarts, 2007, p. 52) and “has been vastly overrated; instead, it is often a post-hoc explanation of responses that emanated from the adaptive unconscious” (Wilson, 2002, p. 107). What about our phenomenological feeling of agency? These scholars consider self-knowledge a poor, unreliable measure, citing studies on confabulation, choice blindness, and misattribution of agency (e.g., Bar-Anan, Wilson, & Hassin, 2010; Hall, Johansson, Tärning, Sikström, & Deutgen, 2010; Johansson, Hall, Sikström, & Olsson, 2005; Wegner, 2002). The magnitude of empirical evidence supporting the effect of unconscious processes on behavior left some wondering whether Freud is really dead (Westen, 1999) and whether the cognitive revolution would be just a detour to behaviourism (Mischel, 1997).

Our exercise of agency has further been challenged by other paradigms as well. For example, random events are said to ‘rule our lives’ (Mlodinow, 2008), where accidental occurrences can become life-changing occasions. Our free will is also constrained by hormones and other biological factors, such as the effect of testosterone level on generosity (Zak et al., 2009) and social dominance (Terburg, Aarts, & van Honk, 2012), or the impact of

diet on depression (Akbaraly et al., 2009; Sánchez-Villegas et al., 2009) and on cognitive ability in childhood (von Stumm, 2012) and adulthood (Kesse-Guyot et al., 2012). The effects in all of these cases operate below the threshold of consciousness, and therefore we are unable to control them directly. However, as discussed below, some scholars argue that we can still exert indirect, second-order control (Bandura, 2008) by learning about these effects and behaving adaptively. Researching these issues is therefore an instance of exercising agency.

2.2.3 *Neuroscientific support*

A recent, powerful support to the arguments against direct agency comes from the *neuroscientific paradigm*. Initially, German researchers Hans H. Kornhuber and Lüder Deecke (1965) discovered that voluntary action is preceded by bio-electrical activation in the brain, which they termed *Bereitschaftspotential*, or readiness potential (RP). This finding did not seem particularly remarkable until 20 years later when Benjamin Libet and colleagues (1983) found “somewhat puzzlingly” (Larsen-Freeman & Cameron, 2008, p. 76) that RP precedes even the conscious intention to act. They concluded that ‘voluntary’ action is actually initiated unconsciously. Threatening as it is to free will, this conclusion attracted severe criticism on methodological (Klemm, 2010) and philosophical (Dennett, 2004; Mele, 2009) grounds. Experiments also questioned whether RP represents a decision to act (Trevena & Miller, 2010) and whether introspection is a reliable measure of decision time (Banks & Isham, 2009). Nonetheless, more refined replications confirmed the original findings (Haggard & Eimer, 1999; Matsushashi & Hallett, 2008). Other studies predicted which hand the participant would move with 60% accuracy (Soon et al., 2008) and used direct recordings from single neurons with more than 80% predictive accuracy (Fried, Mukamel, & Kreiman, 2011), the latter being the most accurate approach in contemporary neuroscience (Haggard, 2011). In all of these cases, the participants’ decisions were predicted before the participants themselves were aware they would make those decisions, leading some to conclude that we confuse correlation with causation in the relationship between our sense of agency and our intention to act (Wegner, 2002), and that full awareness of agency may even be ‘postdicted’ by the individual *after* action has been unconsciously initiated (Guggisberg, Dalal, Findlay, & Nagarajan, 2008). Neuroscientist John-Dylan Haynes wonders, “How can I call a will ‘mine’ if I don’t even know when it occurred and what it has decided to do?” (cited by K. Smith, 2011, p. 24). Further, magnetic brain stimulation can induce participants, unbeknownst to them, to choose which hand to move (Ammon &

Gandevia, 1990) and, recently, this non-invasive stimulation was found to improve numerical competence (Cohen Kadosh, Soskic, Iuculano, Kanai, & Walsh, 2010) and other arithmetic skills (Snowball et al., 2013) with effects observed as long as six months later!

On the negative side, disruption to brain functions can have unwanted behavioral consequences. In addition to the famous Phineas Gage, whose personality reportedly changed after a freak work accident that destroyed part of his brain (see Fleischman, 2002; Macmillan, 2000), brain tumors have been blamed for criminal behavior such as indecent conduct (Goldberg, 2001) and pedophilia (Burns & Swerdlow, 2003; see also Mobbs, Lau, Jones, & Frith, 2009) as well as more extreme disorders such as the alien hand syndrome (e.g., Assal, Schwartz, & Vuilleumier, 2007). These findings raise the question of whether our behavior is controlled unconsciously by our neurons. Yet, it is argued, we can exercise agency through consciously ‘vetoing’ the execution of impulses initiated unconsciously (though see Lau, 2009; Libet, 2003, 2004) by implementing a ‘neural brake’ mechanism (Filevich, Kühn, & Haggard, 2012). Furthermore, this process, dubbed ‘free won’t’, is not the only function of consciousness because consciousness is an emergent property that also exerts top-down influence, complementing the unconscious bottom-up influence (Bandura, 2008; Gazzaniga, 2012). Finally, this counterargument assumes that the unconscious initiation of action discovered by Libet is generalizable from the simple finger movement examined in these laboratory studies to all human behavior and cannot be explained away by skill automation (Bandura, 2008).

2.3 Agency fights back

The previous sections have presented in some detail a range of powerful arguments and positions that go against the grain of traditional motivation research by claiming that the antecedent of human behavior is not ‘motivation’ conceived as an attribute of which people are always aware. We have seen some potential counter-arguments, and in the following such arguments will be further explored in an attempt to suggest some possible interim position. Generally, those who adopt pro-agency views argue that the agent, given the same present situation and the same past events, ‘could have done otherwise’. They are usually open to accept that certain factors may play a role in our behavioral choices, but maintain that these factors merely *influence* them, as opposed to *entirely produce* them (Nichols, 2008). “Your genes, your upbringing, and your circumstances may predispose certain behavior tendencies. But ultimately it is you who decides and who bears responsibility” (Myers, 2008, pp. 32–33).

In an attempt to address the issue of agency head on, Baumeister, Masicampo, and Vohs (2011) embarked on the task of answering what at first seems an obvious question: Do conscious thoughts cause behavior? In order to establish causality, these scholars reviewed various carefully-selected lines of research that involve random assignment to experimental manipulations, such as imagining, mental practice, implementation intentions, and anticipation. In support of the agency view, their results showed that conscious causation of behavior is “profound, extensive, adaptive, multifaceted, and empirically strong” (Baumeister et al., 2011, p. 351). Agency proponents will certainly be delighted by this conclusion, but the disparity between this pro-agency conclusion and the wide range of anti-agency findings outlined above raises several questions.

First of all, these two viewpoints need to be reconciled. In their article, Baumeister et al. (2011) realized that the role of conscious thought is not as direct as might be intuitively assumed, but offline and indirect: “Nothing indicated motivations *originating* in consciousness—instead, conscious thoughts interacted with existing motivations” (p. 351, emphasis added). Put differently, in many situations, our agency seems to be represented not in our direct control of behavior, but in our ability to resist an unconscious impulse or to select from multiple competing impulses. These resistant and selective roles of conscious behavior still affirm our agency, and by extension our moral responsibility, albeit in an indirect fashion (cf. Juarrero, 1999; Larsen-Freeman & Cameron, 2008). This indirect view of agency supports a duality within human nature; while on the one hand the terrain with its multiple influences disposes behavior toward one direction, on the other hand agentic behavior requires conscious evaluation of these tendencies and vetoing what is deemed maladaptive.

The second question raised by the disparity of the agency-related findings is how consciousness can exercise its agentic role. That is, even if we accept the mediating influence of consciousness, we still need to explain the mechanism by which this agentic capacity is achieved. As Bargh and Ferguson (2000) argue, construing consciousness as an ‘uncaused cause’ reverts to a Cartesian dualism, which maintains that the mind is a non-physical entity (e.g., a soul) that is excluded from the causal order governing the body; in order to study consciousness scientifically, we must presuppose that it follows the physical laws of our universe. Complexity theory offers one solution that explains conscious free will without violating physical laws. Philosopher Alicia Juarrero (1999) maintains that modern philosophy is based on Aristotle’s (mistaken) contention that cause must be external to its effect. Instead, Juarrero asserts that an alternative to external cause is ‘self-cause’. That is, complex systems

allow emergent properties, and these properties can have qualitatively different functions. From this perspective, consciousness is seen as an emergent property that exerts top-down control on behavior.

The third question concerns who can have this agentic ability. Is everybody capable of it? There seem to be at least two essential prerequisites. The first prerequisite is that one needs to believe in free will (Csikszentmihalyi, 2006). For example, research suggests that belief in determinism can lead to unethical behavior through yielding to enticement (Vohs & Schooler, 2008). Contrary to the philosophers who are interested in the abstract concept of free will and its existence, Dweck and Molden (2008) also argue that what people believe constitutes a psychological question, whose answer constructs differential psychological realities. This is because the laws of our universe referred to above also include human nature and how people view themselves, and this is at least partly self-constructed. To support their view, Dweck and Molden (2008) review diverse lines of research showing that self-theories—as fixed or malleable—have a direct and unequivocal effect on behavior, attitudes, and motivation. They conclude that “personality is, in many ways, a highly dynamic system in which (changeable) beliefs can create a network of motivation and action” (Dweck & Molden, 2008, p. 58) and that “people’s self-theories have a cascade of effects on their personal motivation, as well as on the ways they judge and treat others” (p. 47).

The second prerequisite is that agentic capacity requires becoming cognizant of the factors that influence one’s behavior. Awareness of the effects of unconscious primes may override and disrupt unconscious impulses (Bargh & Chartrand, 2000; Wegner & Bargh, 1998). Group affiliation, for example, may lead to prejudice automatically, but the realization of this susceptibility would help one monitor one’s behavior and hopefully avoid the prejudice trap. People may shape their own destiny by learning about the factors that influence them. Agentic exercise of conscious thought can thus have a causal impact on behavior (for a review, see Baumeister et al., 2011) and therefore it is a false dichotomy to ask whether conscious or unconscious thought causes behavior; it is the interplay between the two (Baumeister & Masicampo, 2010; Nordgren, Bos, & Dijksterhuis, 2011). For this reason, psychological experiments typically involve blinding the hypotheses to be tested for fear of nullifying the independent variables under examination; allowing the participants to be conscious of the actual hypothesis prior to the study is considered “a scientific prohibition” (Bandura, 2007, p. 655). Even covert, nonverbal communication from the experimenter can bias the participants’ performance (Rosenthal, 2003).

In other words, the emergent nature of consciousness seems to allow one to exercise agency by recycling and reprocessing knowledge in order to reshape the boundaries of the system and change its trajectory. This illustrates the nonlinearity of the system; the same situational input (the terrain) can have divergent outputs depending on one's expertise and attentiveness to input particulars. This conceptualization is compatible with the First Law of Thermodynamics (cf. Juarrero, 1999), which states that energy is always conserved, cannot be created or destroyed, and can only be converted from one form into another. That is, consciousness does not have to be an uncaused cause (or caused by a non-physical entity), but a reorganization of existing knowledge. Fate, we may argue, is not dictated by the terrain, but by whether one yields to, or resists it. In fact, it is probably this capacity to resist attractive attractors that makes humans unique. If our behavior were solely a product of the terrain, looking back and feeling proud about one's achievements would become meaningless.

An example of this agentic achievement should make the point clearer. A vivid illustration comes from research on psychological resilience. Resilience is defined as "the maintenance of positive adaptation by individuals despite experiences of significant adversity" (Luthar, Cicchetti, & Becker, 2000, p. 543). That is, some individuals are able to sustain normal functioning in situations of extreme stress, significant threat, severe adversity, and trauma (Cicchetti, 2010), and can actually thrive after these aversive events (Bonanno, 2004). Such cases might be more interesting than cases where an individual follows the expected trajectory by succumbing to a negative attractor basin and consequently developing, say, mental disorders or other psychopathologies. Initially, theorists assumed that such resilient cases are exceptional, but empirical studies have shown that resilience is actually *the most common* response to potential trauma (Bonanno, 2005). Although it might be tempting to think of resilience as an individual difference trait, resilience researchers have forcefully challenged such a view. These researchers argue that resilience is not "in" the person (Masten, 2012, p. 208) or something that an individual "has" (Cicchetti, 2010, p. 146). Instead, they stress that resilience emerges from the dynamic interaction of multiple factors, internal and external to the individual, that have differential effects depending on time and context.

Furthermore, like in so many other areas, researchers have been able to discover specific genes that appear associated with resilience. Kendler (2006) argues, however, that the expression 'X is a gene for Y' is misleading because it implies a causal relationship that is strong, clear, and direct, while in fact genes play a contributory role working in concert with

a host of other factors. Indeed, recent findings dispute the direct causal role of genes suggesting that:

there is much more scope for a single gene to have multiple diverse actions. But, even more basically, this dynamic process forces one to reconceptualize just what is meant by a gene. These new findings in no way undermine the evidence of the crucial pervasive importance of genes but they do undermine any notion that genes are determinative in a simplistic fashion favored by the genetic evangelists. (Rutter, 2006, p. 151)

2.4 Conclusion

Going back to the original question of whether the beach ball has free will, the above overview is consistent with Larsen-Freeman and Cameron's (2008, p. 76) assertion that "we can marshal some substantial support for a positive answer to this question" and with Juarrero's conclusion that "We are not passive products of either the environment or external forces. In a very real sense *we* contribute to the circumstances that will constrain us later on" (Juarrero, 1999, p. 253, emphasis added). This position is moderately optimistic as it rejects both the extreme view that we have absolute control over our behavior, and the other extreme that our behavior is entirely ruled by unconscious processes and external factors. Although past research has supported several behaviorist claims, investigations also point to our ability to exercise agency indirectly through top-down control (e.g., Baumeister et al., 2011; Windmann, 2005). This means that unconscious motivation plays a prominent role in human motivation. This thesis investigates the role of unconscious motivation.

On a more theoretical note, this conclusion compels us to make an important distinction between the beach ball and the individual in relation to attractor states. While the ball gravitates toward various attractors, individuals can agentially repel themselves from certain others. As demonstrated in resilience research, this ironic process—repelling from attractors—is not uncommon and requires ordinary rather than extraordinary abilities, hence its nickname 'ordinary magic' (Masten, 2001). Motivational theorizing within a complexity framework has paid little attention to this repellent process to date and has instead focused on the expected trajectory of individuals gravitating toward attractor states. However, being at the heart of human agency, conscious repellent processes certainly deserve more attention in future research.

Chapter 3: Motivation across Language Learning Field⁴

we witnessed an astonishing amount of recent activity that has left the field in a state
barely recognizable from a decade ago
—Dörnyei and Ryan (2015, p. 194)

3.1 Introduction

One day, a Canadian graduate student met with his advisor to discuss possible thesis topics. During that meeting, the student remarked that he could not see how one could learn the language of another group if s/he does not like that group. At this point the advisor said, “Hey man. There’s your thesis!” The student was Robert Gardner with his supervisor Wallace Lambert at McGill University in 1956 (Gardner, 2001b). That meeting gave birth to the field of second language (L2) motivation and was the primary instigator of decades of research.

Building on the previous chapter, the purpose of this chapter is to offer a historical background of research into language motivation, and then highlight a number of emerging themes that seem to hold potential for future research. This chapter shows that our field is not immune to the ‘wind of change’, in that a number of exciting developments are taking place. One of these themes is unconscious motivation. This theme is introduced briefly in this context in order to position it side by side with other themes in the field. The following chapter will be fully devoted to unconscious motivation.

The analysis in this chapter builds on and expands previous efforts to understand the historical trajectory of the field (e.g., Dörnyei, 2005; Dörnyei & Ryan, 2015; Dörnyei & Ushioda, 2011). These historical analyses have identified three phases that the field has gone through. The first is the social psychological period, in which a common theme was the focus on the macro-perspective language learning. That research was largely concerned with affective factors in intergroup relations. The field then progressed into a second phase, in which the scope of research was expanded to address the individual learner in the micro-context of the classroom and on the cognitive processes underlying language learning. Finally, the current, third phase is witnessing the emergence of several innovative directions that are surveyed in this chapter.

⁴ A version of this chapter has appeared in Al-Hoorie (2017).

Previous surveys of the field may be characterized as back-pointing, in that they have primarily focused on trends found in the past two phases without elaborating on the emerging trends in the current period. The present analysis therefore offers a more forward-pointing survey of these emerging trends. As reviewed below, some of these themes have been discussed separately in the literature, but they have not been synthesized and presented in one place to date.

It goes without saying that there will always be some overlap between historical phases, and that there are some researchers who have made important contributions to more than one phase. Therefore, I do appreciate that “we need to take care not to portray researchers... as part of a coordinated, focused movement, when it was more the case of various diverse concerns emerging at a similar time” (Dörnyei & Ryan, 2015, p. 80). Still, understanding the historical trajectory of the field would allow us to make projections and future recommendations.

3.2 The social psychological period

The social psychological period was spearheaded by Gardner and associates in Canada (e.g., see Gardner, 1979, 1985, 2010). The fundamental basis of this research is the assumption that learning an L2 is different from other school subjects because L2 learning additionally requires openness to the L2 group and willingness to adopt features from it. This concept came to be known as integrative motivation. A number of researchers in the first part of the 20th century—including Arsenian, Marckwardt, Nida, Whyte, and Holmberg—who challenged the then-dominant view that intelligence and aptitude are the primary factors in successful L2 learning. Building on work by these researchers, Gardner undertook a more focused investigation into the role of affective factors.

Gardner (2010) classifies the history of his own research program into three phases. He calls the first phase *ancient history*. This phase dates from 1945 to 1972, and covers the above early researchers as well as Gardner’s MA and PhD work and later research included in Gardner and Lambert (1972). The second phase, or *early history*, spans the 1970s and the early 1980s. During this period, Gardner and P. C. Smythe obtained funding to establish the Language Research Group at the University of West Ontario, and conducted studies across Canada. Gardner calls the last phase of his research *modern history*, which describes work conducted in the 1980s. This is when Gardner and his graduate students continued research after the Language Research Group was disbanded. (As explained in more detail below, the 1990s marked the beginning of the cognitive–situated period.)

During these three phases, Gardner and associates engaged in a very productive research program, which led to the development of the socio-educational model (for a review, see Gardner, 2010). This model postulates four different aspects of the learning process: social milieu (cultural and educational backgrounds), individual differences (intelligence, aptitude, motivation, and anxiety), acquisition contexts (formal versus informal), and outcomes (linguistic versus non-linguistic). Most empirical research focused on the integrative motive, according to which language achievement is influenced positively by motivation and aptitude, and negatively by language anxiety. Motivation, in turn, is a function of integrativeness, attitudes toward the learning situation, and instrumentality. Gardner (2007) also identifies four stages of L2 development: elemental, consolidation, conscious expression, and automaticity and thought. From this perspective, “acquisition involves making the language part of the self” (Gardner, 2010, p. 7).

This research generated the Attitude/Motivation Test Battery (AMTB), which has undergone extensive validation research examining its psychometric properties. This instrument has also permitted Gardner and associates to test a large set of formal hypotheses derived from the socio-educational model. Gardner (1985, 2010) summaries the major findings from this research:

- *Higher achievement:* Integratively motivated learners consistently achieve higher grades than those who are not so motivated.
- *Classroom behavior:* Integratively motivated learners volunteer more frequently in the L2 class, give correct answers more often, and seem more satisfied at the end of the class. This pattern could not be explained away by other factors, such as teachers’ differential treatment.
- *Persistence in L2 studies:* Integrative motivation is a better predictor of re-enrolment in the L2 class than is aptitude.
- *More autonomy:* Learners who opt for self-instructional courses are more integratively motivated than are learners who prefer regular courses.
- *Rate of learning:* Integratively motivated students learn significantly faster than do students with low integrative motivation.
- *Length of learning:* Integratively motivated learners spend more time studying than do instrumentally motivated ones, who quit once the reward is no longer available.

- *Lower Anxiety*: Integratively motivated learners report less state anxiety during learning.
- *Participation in excursion programs*: Integrative motivation has an influence on learner's decision to take part in excursion programs into areas where the L2 is spoken, and on behavior while there.
- *Attrition after learning*: Integrative motivation has a negative effect on attrition, and this effect is mediated by initial achievement and subsequent use.
- *Mediating the effect of personality*: Both integrative motivation and aptitude mediate the effect of personality on L2 achievement.
- *Language-specificity*: Integrative motivation is language-specific, in that the learning benefits described above are specific to the language that the learner is integratively motivated to learn, and do not generalize to other languages.
- *Application to L1*: Learners who show more integrative motivation in relation to their own L1 are also more successful in advanced L1 studies.
- *Application to foreign language contexts*: Because some of this research was conducted in Canadian provinces that are predominantly monolingual, Gardner argued that the results are therefore generalizable to foreign language contexts. More recently, Gardner (2010, Chap. 7) reviewed research that was conducted in different countries around the world, and that also supported his model. These countries include Brazil, Croatia, Japan, Poland, Romania, and Spain.

A meta-analysis of research by Gardner and associates shows that the mean correlation between the motivation construct in Gardner's model and school grades is .37 (Masgoret & Gardner, 2003). This coherent line of research consolidated the socio-educational model, making it the most established theory of L2 motivation for several decades in a row.

Although Gardner's framework was arguably the dominant paradigm in the social psychological period, there were also other frameworks active at the time. These include Clément's (1980) social context model, Giles and Byrne's (1982) intergroup model, and Schumann's (1978) acculturation model. However, as Dörnyei and Ryan (2015) observe, the common theme shared by all of these approaches is their macro-level analysis of the interrelationship between social groups and contextual variables. Serious interest in the individual learner in the classroom micro-context had to wait until the second period.

3.3 The cognitive–situated period

For decades, Gardner and associates have repeatedly insisted that the socio-educational model is dynamic rather than static (e.g., Gardner, 2010, p. 46; Gardner & Tremblay, 1994, p. 366; MacIntyre, 2002, p. 49) and that it “does not just link variables together but describes a process” (Gardner, 2010, p. 59). Nevertheless, Gardner has also acknowledged that,

It is not intended to provide explanations to individual teachers as to why or why not some of their students are more or less successful than others, or to give teachers advice on how to motivate their students, or to provide reasons to students to help them understand their own success or lack thereof. It is a model to account for general relationships in a parsimonious and testable structure that is subject to verification and replication. (Gardner, 2010, p. 26)

In addition to not being classroom-friendly, Gardner’s model was criticized from other perspectives. For example, Dörnyei (1994b, 2005) explains that mixing motivational intensity (i.e., effort) with the abstract mental phenomenon of motivation will increase the construct’s predictability of the behavioral ‘outcome’ simply because behavior is already part of it (see also MacIntyre, 2002, p. 49). Additionally, with the spread of World English as a decentralized global language, the idea of integrating with native speakers from Anglophone countries started to become less and less meaningful (e.g., Coetzee-Van Rooy, 2006). Some integrative and instrumental orientations have also become hardly distinguishable (Lamb, 2004).

Starting from the 1990s, these accumulating issues led language motivation research to shift into a new phase, which was described as the *cognitive–situated period* (Dörnyei & Ryan, 2015; Dörnyei & Ushioda, 2011). Because Gardner’s integrativeness was conceived of as an affective factor, Dörnyei (e.g., 2010) tried to uncover its cognitive underpinnings through reinterpreting it into the ideal L2 self. The attempt to reinterpret integrativeness in cognitive light gave birth to the L2 Motivational Self System (L2 MSS, Dörnyei, 2005, 2009b). The L2 MSS consists of the ideal L2 self, the ought-to L2 self, and the L2 learning experience, thus preserving the original tripartite conceptualization of the integrative motive. The L2 MSS is based on two ‘parent’ theories, self-discrepancy theory (Higgins, 1987) and possible selves theory (Markus & Nurius, 1986). On the one hand, learners experience uneasiness if their perceived level of proficiency is discrepant from the level they aspire to achieve (i.e., actual–ideal discrepancy) or from the level they think they are expected to meet

(i.e., actual–ought discrepancy). This psychological uneasiness may serve as a motivator to reduce this discrepancy by improving L2 proficiency. On the other hand, possessing an elaborate vision of a desired possible self may intensify one’s motivation because the imagined self becomes an experiential reality that the individual can see and hear. The closest parallel to this ideal self-image is the L2 native speaker. Learners, therefore, could draw from their past knowledge of L2 speakers to envision for themselves a desired future that would have a motivational effect in the present. According to a survey of language motivation research spanning about a decade, Boo, Dörnyei, and Ryan (2015) observed that the L2 MSS is currently the dominant framework in the field.

In another survey spanning about two decades, Sugita McEown, Noels, and Chaffee (2014) also observed that an increasing number of researchers have used Self-Determination Theory (SDT, Deci & Ryan, 1985) as their primary theoretical framework, or have drawn from some aspects of it. According to SDT, individuals have an inherent proclivity to seek out novel and stimulating experiences in order to expand their capacities and learn. This is what SDT calls intrinsic motivation. Additionally, SDT proposes that individuals might also be motivated to engage in an activity when it is perceived as consistent with one’s sense of self and its values (integrated regulation), when it facilitates attainment of other self-defining values (identified regulation), when it is not perceived as valuable but—because significant others perceive it so—it acquires self-esteem implications (introjected regulation), or when it is simply associated with certain rewards or punishments (e.g., passing a test or gaining a job promotion, external regulation).

In addition to these two theoretical frameworks, some researchers have continued trying to realign language motivation with educational psychology and to make use of other non-L2-specific theories, such as social cognitive theory (e.g., Mills, Pajares, & Herron, 2007) and attribution theory (e.g., M. Williams, Burden, Poulet, & Maun, 2004). The scope of research was also expanded to involve some innovative constructs, including vision (Dörnyei & Kubanyiova, 2014) and imagination (Norton, 2013). This type of innovation necessitated also expanding the methodological repertoire, which has led to an increasing number of qualitative investigations as well as practical applications of language motivation research into classrooms (Boo et al., 2015). In fact, because this research has been so concerned with classroom processes and with making motivation research more teacher-friendly—as opposed to the focus on larger picture in the social psychological period—it might be appropriate to describe this phase as the *educational period*.

Another interesting development is the recognition of the role of identity (e.g., Dörnyei & Ushioda, 2009). This follows an early trend in motivational psychology (e.g., Foote, 1951), and a more recent trend in other SLA disciplines, with some researchers portraying language learning as a struggle to develop a new identity (van Lier, 2007) and a liberation from the monolingual one (Kramsch, 2009). In fact, Block (2007) describes this trend as ‘the rise of identity in SLA research’. Indeed, identity is considered a central, organizing construct that constitutes the gate to understanding motivation and learning engagement or lack thereof (e.g., Oyserman, 2015; Turner & Nolen, 2015), while identification is seen as the basic motivational mechanism (Brophy, 2009), without which discussions of motivation and competence are incomplete (Wigfield & Wagner, 2005). Due to its centrality, identity will most likely remain a vital theme in future research.

3.4 The current period

According to Dörnyei and Ryan’s (2015) historical analysis, the language motivation field is currently in its third phase. Dörnyei and Ryan characterize this period by the shift to socio-dynamic perspectives. Indeed, perhaps the most salient characteristic of this phase is the growing emphasis on the dynamic nature of motivation and its temporal variation. However, a number of other themes are also emerging, and this makes it hard to give this period a single monolithic title. Such titles usually emerge in retrospect, especially when the field is ready to move to a new phase.

Looking at developments in the field from a broader perspective, some commentators (e.g., Boo et al., 2015; Sugita McEown et al., 2014) have also pointed out some limitations in previous research. For example, both of these periods coincide in characterizing motivation as a conscious process in which learning English—rather than other languages—is examined within a relatively short duration and using rather “simplistic” research designs (Boo et al., p. 156). The samples investigated also tend to be tertiary students, while different theoretical frameworks have tested participants from different age groups and from different cultural backgrounds, thus making cross-theoretical comparisons problematic (Sugita McEown et al., 2014). Additionally, most of this research has overlooked the increasing technologization of everyday life and its impact on language learning nowadays. Some of these themes are discussed in more detail in this section.

3.4.1 *Stable vs. dynamic*

The observation that, unlike L1 learners, L2 learners vary substantially how successful they are in their language proficiency prompted research into individual differences (IDs). Researchers identified several ID factors that could potentially account for this variability, such as aptitude, motivation, learning styles, learning strategies, and anxiety (e.g., Dörnyei, 2005; Skehan, 1989). This approach can be intuitively summarized as finding out “*why, how long, how hard, how well, how proactively, and in what way* the learner engaged in the learning process” (Dörnyei & Ryan, 2015, p. 6, original italics). Despite the intuitive appeal of this approach, recent theoretical analysis suggests that it is no longer tenable. In fact, because this approach rests on a number of problematic assumptions, Dörnyei (2009c) has described it as the ‘individual differences myth’.

One of these problematic assumptions is that these IDs are clearly identifiable (Dörnyei, 2009c). However, close examination of some of the traditional IDs shows that the borders between them are fuzzier than first assumed. For example, while motivation is traditionally viewed as an affective factor and has been contrasted with the cognitive nature of aptitude, in reality most influential motivational theories draw heavily from cognitive research and have cognitive components. Another example is anxiety, which is sometimes treated as a motivational component, sometimes as a personality trait, and sometimes as an emotion (MacIntyre, 2002). Similarly, aptitude involves not only cognitive aspects, but also affective and conative dimensions (P. Robinson, 2007). The fuzzy distinction between the different IDs calls into question their modular, monolithic view.

Another problematic assumption is that IDs are relatively stable (Dörnyei, 2009c). However, it is now increasingly recognized that, far from being stable, IDs are highly sensitive to contextual and temporal variation. From context to context and from time to time, the different IDs fluctuate and consequently their effect on language learning correspondingly fluctuates. A ‘motivated’ learner may be less motivated on the next day, or at the next task. Even fluid intelligence and language aptitude are not fixed. Fluid intelligence, which used to be assumed fixed and genetically predetermined, interacts with the environment, and therefore it is “dynamic rather than static and modifiable rather than fixed,” which makes it “trainable to a significant and meaningful degree” (Sternberg, 2008, p. 6791). Neither is language aptitude independent of context, and instead it is sensitive to task and situation specificity (P. Robinson, 2007). Therefore, the observed association between a cause and its effect may be substantial at one occasion but negligible at another (Ellis & Larsen-Freeman,

2006). “People do what their immediate situations tell them to do rather than what their long-standing internal traits might prompt them to do” (McAdams, 2006, p. 12).

Another curious situation is that ID research has actually been concerned more with group aggregates rather than individuals, making the term ‘individual differences’ research somewhat of a misnomer (Dörnyei, 2009c). Originally, the idea that variability is unwanted noise that should be eliminated through aggregation was firmly established by the work of Ronald A. Fisher, whose statistical revolution originated primarily from his extensive study of crop variation. As Barlow, Nock, and Hersen (2009) explain, in this agronomical approach “the fate of the individual plant is irrelevant in the context of the yield from the group of plants... if the yield is better *on the average* than a similar plot treated differently” (p. 7, original emphasis). However, this wholesale approach does not always work in the social sciences. Especially when it comes to language learning, many questions require more fine-tuned understanding of the phenomenon of interest, and therefore this generic group-based approach is usually useful only as a starting point for more detailed analyses.

An alternative to the modular view of IDs is that learner characteristics are dynamically changing both in response to context and time, and as a result of their interaction with each other. Dörnyei (2009c, p. 231) suggests that dynamic systems theory may be a viable approach that can do justice to this complex conceptualization. The adoption of a complexity theory perspective in language motivation may be seen as officially inaugurated by the publication of a recent anthology edited by Dörnyei, MacIntyre, and Henry (2015). The contributors to this volume drew from a variety of data-analytic techniques to examine the dynamics of motivation such as idiodynamics, latent growth modeling, and trajectory equifinality analysis. Dörnyei and Ryan (2015, p. 102) anticipate that this new perspective has the potential to keep language motivation researchers busy for the next decade. Dörnyei’s conclusion aptly summarizes the gist of this novel direction:

I have come to believe that the key area where the traditional ID view must be reformed is the need to accept that individual variation is not so much a function of the strength of any individual determinant (e.g. aptitude or motivation) as the way by which the complex system of all the relevant factors works together. (Dörnyei, 2009c, p. 195)

3.4.2 *Cognitive vs. affective*

Dörnyei's attempt to reinterpret integrativeness in cognitive terms was part of a more general trend in the language motivation field. Starting in the early 1990s, researchers tried to adopt cognitive constructs following the then-trendy approach in educational psychological research (e.g., Dörnyei, 1994a). This general shift from affective-based models to cognitive-based models seems to implicitly reflect the view that affect is a 'post-cognition' phenomenon, in that affect is a mere result of cognition (e.g., Muncy, 1986): Once we understand the cognitive processes involved, we can then deduce the affective outcomes. While this view was dominant after the cognitive revolution, more recent research has cast doubt on it. For example, Pessoa (2008) argues that, at the neural level, the view that cognition and emotion are separate entities does not hold; in many cases, the two contribute jointly to behavior (see also Okon-Singer, Hendler, Pessoa, & Shackman, 2015). The situation is no different when it comes to language learning. As Schumann (1997) explains, "from a neural perspective, not only are various affective processes interrelated, but affect and cognition are also intimately intertwined" (p. 238). If this is the case, then affect should also be integrated in our models. (See also Ford, 1992, who details the need for clear accounts of cognitive and effective processes, calling it an identity crisis in the motivation field.)

A number of SLA researchers have started to recognize the need for such an integrative approach. For example, MacIntyre, Noels, and Moore (2010) maintain that researchers with a certain theoretical stance can obtain certain perspectives, but each theoretical stance also inherently conceals certain other perspectives. Similarly, Pavlenko (2013) advocates an integrative approach, in which researchers should "merge [these] lines of inquiry, placing embodied subjects in their linguistic and social contexts" (p. 6). In a similar fashion, Dörnyei and Ushioda (2011) propose a systemic approach that involves motivation conglomerates. In this view, rather than isolated and distinct individual difference variables, conglomerates include both cognitive and affective factors as wholes, such as interest, flow, and self-guides (see also Dörnyei, 2009c; Dörnyei & Ryan, 2015). Indeed, due to the complexity of human motivation and its intimate connection with identity, the cognitive approach alone may be insufficient without considering the affective dimension as well. The growing awareness of the need for an affective dimension has been dubbed as the affective turn in SLA (Pavlenko, 2013).

An important class of this affective dimension is emotions, due to their close connection to identity and adjustment in language learning (e.g., Noels, Pon, & Clément,

1996). In fact, it might be argued that emotions are ‘true’ affects, while the affective-based models in the first period may actually be cognitive to some extent. Despite this, emotions have not received adequate attention in the SLA field in general and in language motivation in particular. Dörnyei and Ryan (2015) blame this on the cognitivist roots of SLA, as well as the irregular, fluctuating nature of emotions. This is why Dörnyei and Ryan (2015) describe emotions as “the greatest omission” (p. 9) among individual difference variables, leading the field to suffering from an “emotional deficit” (p. 10). Emotions were also described as “fundamentally important motivators” (MacIntyre, Mackinnon, & Clément, 2009, p. 47) and as “the fundamental basis of motivation” (MacIntyre, 2002, p. 45), since motivation without emotion remains cold cognition that lacks potency. Swain (2013) also considers emotions the elephant in the room, maintaining that cognition and emotion are at least interdependent and at most integrated and inseparable. In line with this perspective, Dörnyei (2009c) has rethought the role of emotions in SLA, treating the emotional system as equal to the cognitive and motivational systems.

Despite the fact that emotions have long been kept “in the shadows” of language learning discussions in favor of other variables (Garrett & Young, 2009, p. 209), actual classroom experience indicates that ability and attitudes alone are not sufficient to support motivation (MacIntyre, 2002). Classrooms in general are a cause of emotional turmoil for many people, and the language classroom in particular can be an especially emotionally loaded experience (Dörnyei & Murphy, 2010). As an illustration, MacIntyre (2002) gives the example of embarrassment. It is hard to imagine a language learner who has not been in an embarrassing situation in the language classroom and, depending on the intensity of embarrassment, the learner might resort to withdrawal or reticence as a form of emotional defense (King, 2011). It does not help that curriculum designers find it easier to focus on rigid activities that involve little emotional investment, which puts further burden on the teacher (Dewaele, 2005, 2011, 2015). To deal with this situation, Kramsch (2009) recommends that teachers try to detect aspects in the syllabus that can be subject to emotional arousal, such as love or hate, in order to encourage more learner investment in the lesson.

Research into emotions in language learning has traditionally tended to focus on the detrimental effects of negative emotions, most notably anxiety (e.g., Horwitz, Horwitz, & Cope, 1986). More recently, however, Gregersen and MacIntyre (2014) have argued that neither are negative emotions always bad, nor should researchers overlook positive emotions. This position has materialized most clearly in the publication of three anthologies in the same year (Gabryś-Barker & Gałajda, 2016; Gkonou, Tatzl, & Mercer, 2016; MacIntyre,

Gregersen, & Mercer, 2016) marking the inception of the positive psychology movement in SLA. The contributors to these anthologies discuss non-traditional topics relating emotions to language learning. Examples include empathy, hope and hardiness, enjoyment, flow, eudemonic happiness, and love. Considering the controversial status of positive psychology (e.g., Coyne & Tennen, 2010), the next few years would reveal the extent to which this movement is accepted in mainstream L2 motivation.

3.4.3 Short- vs. long-term

If motivation is tightly connected to identity, then understanding how identity develops in the first place should be a central concern. Identity does not emerge in a vacuum, but develops through interaction with various events in one's life history. The life history of each learner plays a major role in whether s/he decides to take up learning the language and whether s/he sees a reason to persist in it. This requires researchers to look at the bigger picture of the ecology motivation. As an illustration, educational psychologist Avi Kaplan describes how this notion emerged in his research:

Exploring various methodologies, [Kaplan] conducted a narrative interview study with 10 undergraduate students, aiming to understand the processes that led them to adopt different achievement goal orientations toward their studies in college. To his surprise, when asked about their experiences, choices, and engagement in college, the students spoke relatively little about the characteristics of the learning environment, their self-efficacy, or their attributions for success and failure. Instead, they elaborated on growing up in their hometown, their high school experiences, their dilemmas concerning careers and relationships, their family, ethnicity, friends, and the peer groups they belonged to or wanted to belong to. These students mentioned schoolwork specifically when the material seemed to be relevant to who they thought they were and who they considered or wanted to be. [Kaplan] had the insight that, to a large extent, these students' achievement goals in college were based in their identity and identity formation processes. (Kaplan & Flum, 2009, p. 73)

Building on Erik Erikson's (1968) theory of identity development, James Marcia (1966, 1967) proposed an influential theory of identity development. Marcia identified four *identity statuses*, or types, that individuals develop through socialization processes. From lowest to highest, these identity statuses are

- diffusion identity, those who have not made life commitments and are not interested in doing so;
- foreclosure identity, those who have committed without exploration, such as following parental standards;
- moratorium identity, those who are still in the process of searching for commitments to establish their identities; and
- identity achievement, those who have made life commitments after meaningful exploration (for a more recent analysis, see Kroger & Marcia, 2011).

Meta-analyses of 40 years of research into these identity statuses show that individuals with the higher types tend to exhibit superior cognitive, emotional, self-determined, and interpersonal skills (Martinussen & Kroger, 2013). The socialization processes giving rise to these identity statuses are further complicated by neuroscientific evidence showing that different areas in the adolescent brain mature unevenly leading to problems in the self-regulation of emotions and behavior (Van Leijenhorst & Crone, 2009, p. 212). Consequently, due to these various socialization and maturation factors, about half of late adolescents fail to progress to higher identity statuses by the time they leave tertiary education (Kroger, 2003, p. 215), and therefore the scope of identity development spans well into adulthood (Hoshman, 2003).

Investigation of this developmental change and fluctuation may be achieved through micro- and macro-process models (cf. Dörnyei & Ottó, 1998), and this requires longitudinal designs. Unfortunately, longitudinal designs are a minority in the language motivation literature, while the majority of research is cross-sectional (Sugita McEown et al., 2014). This status quo creates gaps in our knowledge. For example, despite their popularity in the literature lately, L2 self-guides have been typically examined cross-sectionally, and so little is known about how they initially develop or their evolutionary trajectories over time. For example, Dörnyei (2009b) suggests that L2 self-guides might not be appropriate for pre-secondary learners (see also Lamb, 2012), but there is “virtual absence” (Boo et al., 2015, p. 156) of systematic research into the motivation of younger learners.

An interesting exception to the lack of research on long-term motivation is the recent development of the notion of Directed Motivational Currents (DMCs, Dörnyei, Henry, & Muir, 2016; Dörnyei, Ibrahim, & Muir, 2015; Dörnyei, Muir, & Ibrahim, 2014; Muir &

Dörnyei, 2013). DMCs may be described as flow-like experiences (cf. Csikszentmihalyi, 1975) that extend over diverse tasks unified by an overall goal. In other words, DMCs are unique motivational surges that span over longer time-scales and that are not necessarily enjoyable in themselves—since pleasure is derived from the end goal that is external to the activity. DMCs therefore occur when there is a clear vision of that goal as well as an identifiable factor triggering the launch of motivation. After their launch, DMCs are then maintained by ongoing behavioral routines and progress checks. Eventually, DMCs decline and motivation goes back to its normal levels. In explaining the rationale behind the term *Directed Motivational Currents*, Dörnyei et al. (2016) explain that “Both motivational and ocean currents represent a formidable flow of energy, carrying the life-forms caught up within them unimaginable distances” (p. xi).

In a first empirical study of the concept of DMCs, Henry, Davydenko, and Dörnyei (2015) conducted interviews with language learners who had experienced DMCs. The results showed that DMCs are characterized by a salient facilitative structure, involvement of identity investment goals, and positive emotionality. Further investigation into this positive emotionality revealed that participants attribute it to the feeling that their entire identity was being transformed in the process (Ibrahim, 2016a). Other empirical research showed that DMCs can also be experienced by a group of individuals working on a project (Ibrahim, 2016b) and can be intentionally induced by teachers (Muir, 2016). These findings came from learners with different linguistic and cultural backgrounds learning typologically different languages (second, foreign, and global), suggesting that DMCs are not limited to particular contexts. These results also suggest that the dynamics of such motivational surges may be different from regular, and even high, motivation. It is clear that this line of research has a lot of potential, especially since the DMC concept is still not mainstream even motivational psychology.

3.4.4. English vs. other languages

The SLA field is concerned with “the processes by which school-aged children, adolescents, and adults learn and use, at any point in life, an additional language, including second, foreign, indigenous, minority, or heritage languages” (The Douglas Fir Group, 2016, p. 19) as well as sign languages (Woll & Adam, 2012). This is one factor why there has been a growing interest in multilingualism in other SLA disciplines, which has amounted to a multilingual turn (e.g., Conteh & Meier, 2014; May, 2014b). This interest in multilingualism follows the recognition of “the dynamic, hybrid, and transnational linguistic repertoires of

multilingual (often migrant) speakers in rapidly diversifying urban conurbations worldwide” (May, 2014a, p. 1). In fact, in recent discussions, there have been calls to go beyond multilingualism. For example, some authors have drawn from Mikhail Bakhtin’s notion of *heteroglossia* to refer to the simultaneous use of multiple language forms and signs and the ensuing conflicts among them (e.g., Bailey, 2012), while critical applied linguists Makoni and Pennycook (2012) question the traditional view of languages as discrete entities rather than fluid and dynamic acts of identity. Makoni and Pennycook use the term *lingua franca multilingualism* to describe this view.

The L2 motivation field has not actively engaged with these developments. Just as its name suggests, *L2* motivation research has mostly looked at learning an L2, typically English. For example, Boo et al.’s (2015) survey shows that research into the motivation to learn English was by far more predominant than research into all other languages combined. Similarly, in the context of heritage language learning, Comanaru and Noels (2009) point out that little work has been done to examine the motivational and affective profiles of these learners. In the context of indigenous languages, Ball (2009) also reports that she conducted a literature search on the difficulties experienced by indigenous language learners, but she could not find a single study that satisfied her search criteria. To quote Leeman and King (2015), research on minority languages “remains marginalized, underfunded, and often an after-thought” (p. 211).

There is reason to argue that the motivation to learn English is qualitatively different from that of learning languages other than English (LOTEs, Dörnyei & Al-Hoorie, in press). Because of the status of English, the motivation to learning it might interfere with the motivation to learn other languages. As an illustration, Dörnyei, Csizér, and Németh (2006) conducted a large-scale longitudinal investigation of language learning motivation— involving over 13,000 learners over a period of 12 years focusing on five target languages (English, German, French, Italian, and Russian) in Hungary. The results revealed a fundamental restructuring of the different L2 learning dispositions. English maintained its high profile, but the other languages dropped steadily. Even the former *lingua franca* of the region, German, gradually became limited to only a selected few. Furthermore, Global English itself also displayed a marked shift over the decade: Although its popularity remained as strong as ever, the correlational link between motivation and the choice of English for language learning decreased, suggesting that the study of English is increasingly becoming a self-evident part of education rather than an L2-specific motivated decision.

Subsequent analysis also suggests that language learners develop distinct ideal L2 self-guides (see Dörnyei & Chan, 2013). It is therefore likely that the self-guides of the influential language would develop more strongly at the expense of self-guides related to other languages. Indeed, in a cluster analysis study, Csizér and Dörnyei (2005) identified different learner profiles and confirmed that a positive disposition toward one language can clash with that of another. Similarly, findings by Henry (2010, 2011) also suggest that learners of different languages possess separate self-concepts and that the motivation to learn English can deplete the working self-concept, thus disadvantaging LOTEs.

All of this leads to the conclusion that the motivational basis of learning English may be quite distinct from that of learning LOTEs. Since most available research is English-biased, then the available theories most likely reflect learning English rather than LOTEs. Paying more attention to LOTEs has the potential to deepen our understanding of the complexities involved in language learning motivation. One interesting outcome of researching LOTEs is that the role in integrative motivation seems to resurface. Integrative motivation might be a relevant concept in the context of LOTEs since there is usually a specific community out there that speaks the language and that is considered the ‘owner’ of that language. Additionally, many individuals who decide to take up learning a certain LOTE do so because they are already in the geographical area where the language is spoken, or because they plan to move there. A person trying to learn Danish, for example, would most likely be thinking about a localized community rather than imagining themselves as a global citizen. The motivation to learn LOTEs is the subject of an upcoming special issue (Ushioda & Dörnyei, in press), which is likely going to stimulate further theoretical and empirical research in the future.

3.4.5 Traditional vs. technological

In 2003, Carol Chapelle declared that “the bond between technology and language use in the modern world should prompt all language professionals to reflect on the ways in which technology is changing the profession of English language teaching in particular, *and applied linguistics as a whole*” (Chapelle, 2003, p. 1, emphasis added). Subsequently, CALL (Computer Assisted Language Learning) became mainstream in applied linguistics with various applications, especially in language testing (e.g., Chapelle & Douglas, 2006). Language motivation researchers also recognized the potential technology has. In an early study, Warschauer (1996) found that students—regardless of gender, experience with computers, or learning context (second versus foreign)—have positive attitudes toward using

computers for writing and communication, and so the author recommended that teachers exploit this to enhance student motivation. Appel and Mullen (2002) also examined the effect of engaging in email exchanges on language learning. The authors devoted a section of their paper to discuss the motivational implications of this strategy. Admittedly, however, although research into CALL has flourished over the years, there has been little overlap between the CALL and language motivation literatures, and these two disciplines have progressed largely independently.

To further complicate the scene, there has been an explosive growth in the use of technology in everyday life recently. In fact, due to the ease of access to online technology and its interactive nature, the popularity of TV and DVDs is starting to wane among young people (Henry, 2013). Nowadays, young people have access to a variety of social networking websites that facilitate exposure to the L2 such as Facebook, Twitter, Instagram, and Snapchat (e.g., Alias, Manan, Yusof, & Pandian, 2012) as well as interactive 3D gaming such as Counter-Strike, Call of Duty, World of Warcraft, The Sims, Second Life, and Unity (e.g., Collentine, 2011; Deutschmann, Panichi, & Molka-Danielsen, 2009; Gee & Hayes, 2010b; Henry, 2013; Peterson, 2010). Internet users can also easily read and contribute to discussion forums, blogs, wikis, and other online communities, all available in English (Kessler, 2009; Pinkman, 2005) and utilize video-conferencing facilities such as Skype and Adobe-Connect (Jauregi, de Graaff, van den Bergh, & Kriz, 2012). Last, but certainly not least, there is the pervasive prevalence of smart phones, tablet computers, wireless laptops, personal digital assistants, and portable MP3 players (Stockwell, 2013). These gadgets also come with a bewildering amount of educational apps (Hirsh-Pasek et al., 2015). In Apple Store alone, there are currently over 75,000 educational apps ready to download (Apple, 2017). This comes amid skepticism about the utility of these apps, and even concerns that they might, ironically, lead to screen addiction, increased aggression, depression, and anxiety (Kardaras, 2016). The inevitable conclusion from the changing face of today's language learning (cf. J. C. Richards, 2015) is that "a new type of student" is emerging (Henry, 2013, p. 138).

It is clear that language motivation research is still lagging behind these developments. At the same time, this rapidly evolving popular culture now constitutes a competition for classroom learning (Gee & Hayes, 2010a). As an illustration, Henry (2013) reports an *authenticity gap* that an increasing number of language learners are experiencing. That is, many learners are exposed to the L2 both inside and outside the classroom, but their experiences outside the classroom are much more stimulating. Contemporary digital gaming, for example, requires intense interaction, communication, and cooperation with real people

(usually in English) in order to proceed in the game. These interactions may include devising sophisticated strategies and plans to carry out military operations to defeat opponents or monsters, which stimulates a lot of creativity and imagination and which can easily induce long flow experiences. These interactions also take place with players from all over the world, including native speakers of English, thus increasingly blurring the line between second and foreign language contexts. Native speakers are now virtually present, and so they no longer need to be present physically in the neighborhood in order for learners to have regular and meaningful interactions with them. These experiences dwarf the routine activities that learners do in the classroom, which now appear banal and trivial in comparison. A number of researchers have therefore called for building bridges between the classroom and these leisure activities in order to make classroom learning more motivating to today's learners (cf. Henry, 2013).

Today's technology has expanded what used to be imaginable for learners and teachers, opening the gate for imagined identities that are characteristic of the new world order (Darvin & Norton, 2015). Drawing from earlier work (K. Richards, 2006; Zimmerman, 1998), Ushioda (2011) argues that technology can be used to harness the learners' *transportable identities*. The notion of transportable identities refers to latent dimensions of one's identity that can be invoked in interaction, such as the teacher being a cat lover or the student being a fan of Manchester United. Ushioda explains that drawing from the identities learners develop through technology would encourage them to engage more genuinely in target-language communications in the classroom. Teachers are no longer limited to the handout they bring to the classroom everyday, but can now draw from topics they find interesting in discussion forums, live chats, blogs, wikis, podcasts, social networking sites, and video-sharing sites. This makes lesson planning take a new meaning. Since this approach treats them as 'people' rather than as abstract 'language learners', students would develop a greater sense of autonomy and ownership of the activity, thus leading to more investment (Ushioda, 2011). This is certainly a promising area for future research.

3.4.6 *Conscious vs. unconscious*

As mentioned in the introduction to this chapter, all these emerging themes demonstrate the wind of change in our field. An attempt to expand the scope to cover unconscious motivation would not therefore be something out of the ordinary. Indeed, a comprehensive picture of motivation and identity cannot be attained without considering the unconscious side. In fact, despite the abundance of perspectives on identity, one idea has stood the test of time: William

James's (1890) distinction between the *I*-self and the *Me*-self. While the *I*-self constitutes the willful and volitional aspects of motivation, the *Me*-self reflects automatic and unconscious motivators. As Roeser and Peck (2009) review, these two systems are separate but functionally interdependent, and both systems have to be accounted for in explanations of motivation and identity. To date, most research on language motivation has, at least implicitly, assumed that the learner is a rational individual who is able to recognize and articulate what motivates him/her. Recently, however, there has been a resurgence in the interest in unconscious motivation in mainstream motivational psychology, as an increasing number of psychologists are starting to realize the importance of unconscious motivators (see Al-Hoorie, 2015). For example, in their review of the emerging themes in mainstream motivational psychology, R. M. Ryan and Legate (2012) document their surprise under the title 'Motivation's Future: What's the Buzz?':

Perhaps the most widely cited future direction that emerged was, at least for us, a somewhat surprising one. Mentioned more than any other area for future research was investigations of *dual-process model* or more study of the distinctions and relations between automatic, or implicit, and deliberative, or explicit, goals. The fact that this interest emerged in so many papers reflects motivation researchers' renewed interest in nonconscious processes and the motivated behavior they can organize. We would add to this the strong interest in the dynamic nature of motivation, as implicit and explicit processes can operate congruently or be in conflict. So despite our surprise it should have been of little wonder that this was the most saliently expressed future direction in the field, since it has both basic research and broad applied implications. (R. M. Ryan & Legate, 2012, p. 563, original italics)

The language motivation field has also reached a level of maturity that allows it to start exploring issues related to unconscious motivation, and to catch up with other SLA sub-disciplines where unconscious processes have become a stable topic of investigation. To be more specific, "our field is ready to expand into exploring these areas because it seems evident that language globalisation has created a linguistic landscape that is characterised by both powerful positive trends and strong negative undercurrents" (Boo et al., 2015, p. 156). In fact, even some aspects of self-regulation can occur through unconscious processes (e.g., Critcher & Ferguson, 2016).

Adopting an unconscious angle of human motivation does not have to be at odds with the current frameworks in the field. For example, neither possible selves theory nor self-discrepancy theory, the two parent theories of the L2 MSS, disapprove of unconscious processes. In terms of possible selves theory, Markus and Nurius (1986) discuss the possibility of the unconscious activation of both positive and negative possible selves (see p. 961). In describing the effects of unconscious activation of possible selves, Oyserman (2013) similarly asserts that “these effects are automatic and do not require that people make a conscious choice as to how to think about themselves” (p. 185; see also Oyserman, 2015, p. 44). In a special issue marking the centennial of the publication of James’s (1890) *The Principles of Psychology*, Markus (1990) contributed with a paper titled ‘On splitting the universe’, in which she endorsed James’s distinction between the *I*-self and the *Me*-self and stressed its relevance today.

Self-discrepancy theory also accommodates unconscious processes: “self-discrepancy theory does not assume that people are aware of either the availability or the accessibility of their self-discrepancies. It is clear that the availability and accessibility of stored social constructs can influence social information processing automatically and without awareness” (Higgins, 1987, p. 324). Neither do the behavioral consequences have to be conscious (Higgins, 1989, p. 98). In fact, self-discrepancy theory does not assume that a future self-guide is a stable individual difference variable (Higgins, 1998, p. 19), but that situational variability can unconsciously induce the motivational effect *independently* from the nature of the learner’s self-guides. In one study, for example, Higgins, Roney, Crowe, and Hymes (1994) used an ostensibly unrelated task to activate either the ideal or ought selves of their participants. Although the participants were not aware that their ideal or ought selves were activated, this activation was still successful in unconsciously shaping their performance on a subsequent free recall task. In other study (Higgins, 1998), either the promotion function of the ideal self or the prevention function of the ought self was activated by simply asking the participants to put in their mouths either a sweet or bitter cotton ball. The results showed that this procedure also activated the relevant self-guide and successfully shaped their performance in the subsequent task unconsciously. If something as simple as the taste of cotton can activate self-guides, then it is likely that real-life classroom situations offer a more diverse stimulus repertoire that can activate self-guides similarly unconsciously.

Gardner’s integrative motivation also allows some room for such unconscious conceptualizations. In Gardner’s (2010) words, integrativeness “is not a conscious decision on the part of the individual and... individuals may not be aware of it.... The rationale

underlying integrative motivation is that emotional factors can influence behavior, sometimes in ways that are not even perceived by the individual concerned” (pp. 223–224). If these factors are not always perceived by the learner, then limiting our empirical analyses to what the learner perceives (e.g., via questionnaires and interviews) can be counterproductive since individuals readily *misattribute* the unconscious sources of their behavior, of which they are obviously unaware, simply to salient and plausible factors in the environment (e.g., Bargh, 1994; Nisbett & Wilson, 1977).

Although current theoretical frameworks are not, in principle, at odds with investigations into unconscious phenomena, researchers in reality have relied predominantly on self-report questionnaires and interviews (Ushioda, 2013). Expanding language motivation research to include implicit processes would enrich the field and open up numerous potential pathways. As an illustration, motivational psychologists have examined the implicit dimension of many well-known constructs. Examples include implicit attitudes (Petty, Fazio, & Briñol, 2009), implicit prejudice and stereotypes (Levinson & Smith, 2012), implicit motives (Schultheiss & Brunstein, 2010b), implicit self-concept (Briñol, Petty, & Wheeler, 2006), implicit self-determination (Keatley, Clarke, Ferguson, & Hagger, 2014), and implicit self-regulation (Koole, McCullough, Kuhl, & Roelofsma, 2010). It is clear that language motivation researchers would benefit from exploring ‘the other side’ of their constructs as well. As explained later, this thesis examines the implicit side of attitudes toward L2 speakers and toward the L2 course.

3.5 Conclusion

This chapter has reviewed the three major phases that the language motivation field has passed through: The social psychological period, the cognitive–situated period, and the current period. The most recent phase is characterized by a number of diverse themes, including the dynamic, affective, unconscious, and long-term aspects of motivation to learn English as well as other languages.

Dörnyei and Ryan (2015) warn that the expanding scope of language motivation research may lead to fragmentation in that researchers in our field “will no longer speak the same language” (p. 102). This seems to be the natural evolution of academic fields as they mature (for an example in psychology, see Sternberg, 2005). The real danger is when different research strands use different jargons to describe very similar phenomena but with little overlap in their reference lists. The situation might be aggravated when specialized conferences become more popular at the expense of conferences with a broader cover. The

socialization process at conferences seems to offer more benefits than might be thought at first.

The next chapter expands on one of the themes addressed in this chapter, namely unconscious motivation. The next chapter reviews various paradigms that have investigated unconscious motivational processes in order to select one promising paradigm for L2 motivation.

Chapter 4: Unconscious Attitudes and Motivation

Freud's view of the unconscious was far too limited. When he said... that consciousness is the tip of the mental iceberg, he was short of the mark by quite a bit— it may be more the size of a snowball on top of that iceberg —Wilson (2002, p. 6)

4.1 Introduction

In 2001, Zoltán Dörnyei predicted that “Although such unconscious motives do not feature strongly in current motivational thinking, it seems clear that they play a significant role in our lives and therefore they are likely to be ‘rediscovered’ before long” (Dörnyei, 2001, p. 7). Indeed, as shown in the previous chapters, contemporary motivational psychology has started to reconsider some of the fundamentals of the cognitive revolution (for reviews, see Al-Hoorie, 2015; Bargh, 2006). More specifically, there has been a resurgence in the interest in cognitive processes that operate at an unconscious level. This point has been surveyed briefly in the previous chapter, and this chapter elaborates more on it.

Originally, in anticipation of the cognitive revolution, Gordon Allport (1937) asserted that there are two sources for human motivation: primitive drives for infants, but for adults motivation is guided by more sophisticated motives such as interests and attitudes. After the cognitive revolution, many motivation researchers took for granted the idea that human motivation is a function of conscious rational processes. They assumed “an agentic, conscious self at the controls, making decisions about courses of action to take and then guiding behavior along those lines” (Bargh, Gollwitzer, & Oettingen, 2010, p. 288). Therefore, in order to explain motivation—which concerns why, how long, and how hard people pursue a course of action (Dörnyei & Ushioda, 2011)—these theories have tended to revolve around two basic aspects, the *desirability* of the outcome and its *feasibility*, along with additional features that are idiosyncratic to each particular theory (see Austin & Vancouver, 1996).

For example, expectancy–value theory (Atkinson, 1957, 1964) with its contemporary versions (e.g., Wigfield & Eccles, 2000) views the individual as engaging a balancing act comparing the perceived likelihood of success in a given endeavor with its perceived value. These two aspects are similarly emphasized in the theory of planned behavior (called attitudes and perceived behavioral control; Fishbein & Ajzen, 2010). Many other motivation

theories have elaborated on feasibility and/or desirability. In terms of feasibility, some theories have emphasized backward evaluations (attributions; Weiner, 1986, 1992), forward evaluations (self-efficacy; Bandura, 1997, 2007), ability conceptualizations (incremental vs. entity; Dweck, 2000; Dweck & Molden, 2005), and feasibility enhancement techniques (goal characteristics; Locke & Latham, 1990, 2002). In terms of desirability, some theories have emphasized whether the activity is valued for its own sake (intrinsic motivation; Deci & Ryan, 1985, 2002), whether the outcome would be instrumental to the attainment of further positive consequences (valence; Vroom, 1964), or whether the future would be bright in general (dispositional optimism; Scheier & Carver, 1987).

In the L2 field, desirability has also been a central concept. This includes the motivation to learn a language for the purpose of affiliating with another linguistic community (integrative motivation; Gardner, 1985, 2010) as well as its cognitive reinterpretation focusing on visualization (the ideal L2 self; Dörnyei, 2005, 2009b). Despite the broad range of these theories and their divergent perspectives, they still share at least one common feature: The role of unconscious motivation has not been studied systematically, and so people are assumed to “weight the incentive value of the desired outcome with the expectancy that it would actually occur” (Bargh et al., 2010, p. 268). Some other motivation theories did attempt to incorporate an unconscious component. For example, some scholars have stressed the importance of self-worth and the consequences of perceived lack of competence on it (Covington, 1984, 1992) and on the use of defensive strategies (Rhodewalt & Vohs, 2005). However, there is still controversy over the extent to which these defenses are conscious (Erdelyi, 2001; Paulhus, Fridhandler, & Hayes, 1997), and whether and how self-deception is possible (see von Hippel & Trivers, 2011). Thus, many 20th-century motivation theories seem to be in line with Allport’s (1953) contention that, except in a minority of psychiatric conditions, “simple, conscious report is the whole truth. It can be taken at its face value” (p. 114).

This chapter surveys different paradigms that have studied unconscious attitudes and motivation. These include the implicit motives tradition, the implicit attitudes tradition, and the contextual priming tradition. Relevance to learning is also discussed in a separate section after each paradigm. Before that, the discussion starts with an overview of the dual-process approach, which attempts to offer an explanation of human cognition that combines both explicit and implicit processes. The chapter ends with a discussion of social desirability bias.

4.2 Duality of the mind

4.2.1 A bit of history

The question whether primacy should be accorded to conscious or unconscious thought has sparked bitter debates throughout modern history. At one extreme, some scholars have posited that conscious thought is the ‘whole truth’, and so self-reports can be taken at their face value (Allport, 1953). At another extreme, some scholars have gone even beyond Freud’s original view that the unconscious is the tip of an iceberg. For example, Wilson (2002) claims that Freud “was short of the mark by quite a bit—it may be more the size of a snowball on top of that iceberg” (p. 6).

According to historical reviews (Gawronski, Sherman, & Trope, 2014; Payne & Gawronski, 2010), research into dual-process frameworks (see below) started to emerge in the 1980s (e.g., Trope, 1986). This research has offered a compromise between the two extreme views. In 1990s, Greenwald and Banaji (1995) reviewed the results this research had generated, and coined the term *implicit social cognition* to refer to notion that constructs such as self-esteem, attitudes, and prejudice can also operate unconsciously. Greenwald and Banaji (1995) introduced implicit social cognition in an attempt to integrate and reinterpret previous research findings and to guide future investigations. Indeed, within just two decades, “virtually every intellectual question in social psychology, and many outside of it, has been shaped by the theories and methods of *implicit social cognition*” (Payne & Gawronski, 2010, p. 1, original italics). In the recent *Oxford Handbook of Human Motivation*, Ryan and Legate (2012) emphasize that the notion that the human mind contains two distinct processes that can have a differential effect on motivation is currently by far the single most widely cited area to hold great potential for future motivation research. In fact, the authors argue that this is where the present-day ‘buzz’ is. The conclusion from this handbook is that this area of inquiry will remain vital in future motivation research. In a more vivid account of the dual-process approach and its impact, Sherman and colleagues explain that,

The emergence of dual-process theories has been one of the most significant developments in the history of scientific psychology. The overarching assumption of these theories is that psychological processes can be divided into two *distinct* categories depending on whether they operate in an automatic or controlled fashion. In recent years, this distinction between ‘fast’ and ‘slow’ modes of thought has even

permeated the popular press and the lay public's understanding of psychology. (J. W. Sherman, Gawronski, & Trope, 2014a, p. xi, emphasis added)

Notice that the authors consider conscious and unconscious processes as 'distinct', and so it is not the case that one is 'in the shadow' of the other. This also suggests that examining one of them does not necessarily tell us much about the other. Therefore, "the way forward for psychological theory is to stop pitting conscious against unconscious and instead figure out how the two work together" (Baumeister, Vohs, & Masicampo, 2014, p. 20; see also Nordgren et al., 2011). The claim that conscious processes play no role would require "a drastic leap of faith" (Baumeister & Sommer, 1997, p. 75) that is not justified by available empirical research (e.g., Baumeister et al., 2011). Currently, only a minority of researchers still explicitly espouse a single-process model (see de Houwer, 2014; Evans, 2008; Helion & Pizarro, 2015, for critiques; see also Hulstijn, 2015, for a language-specific perspective).

4.2.2 Dual-process approach

According to the dual-process approach of cognitive functioning, there are two simultaneous—but qualitatively different—kinds of mental processes (e.g., Chaiken & Trope, 1999; Evans & Frankish, 2009; J. W. Sherman, Gawronski, & Trope, 2014b). More specifically, mental processes can be divided into rule-based and associative (e.g., Strack & Deutsch, 2004). Rule-based processes are controlled and conscious, and they are based on knowledge of facts and values. On the other hand, associative processes are automatic and impulsive, and they occur through repeated exposure. Put differently, associative processes develop through affective reactions that are automatically and efficiently activated once a relevant stimulus is encountered; propositional processes derive from rational judgments based on conscious, logical reasoning (see Evans, 2008; Stanovich, West, & Toplak, 2014, for more detailed comparisons). This distinction is commonly referred to as Type 1 (automatic) and Type 2 (deliberate).

In a detailed analysis of automatic versus controlled processes, Bargh (1994) has decomposed automaticity into four component features, or 'horsemen': awareness, intentionality, controllability, and efficiency. As for awareness, automatic thought can take place without the individual's awareness of some aspects of the process, such as the stimulus (e.g., subliminal priming) or its effect (e.g., stereotyping). Intentionality has to do with the one's inability to exercise control over the instigation of automatic processes, while controllability has to do with the inability to stop or override it. Finally, efficiency refers to

the fact that automatic processes require a very low cognitive load and are not resource-intensive. These are considered characteristics of automatic processes, though they do not have to be all present at the same time in order for a phenomenon to qualify as automatic. More recently, Shea and Frith (2016) have challenged the monolithic view of Type 1 cognition, and divided it into Type 0 (automatic processing and unconscious representation) and Type 1 (automatic processing but conscious representation). Shea and Frith use this distinction to explain why confidence judgments elicited through neural signals are reliable predictors of subsequent performance accuracy, while verbal confidence judgements—affected by other factors such as similarity and fluency—are less reliable.

That automatic processes are efficient constitutes an important advantage. We live in a complex world, in which survival requires efficient navigation. Humans have therefore developed the ability to simplify the overwhelming amount of information they encounter everyday. This simplification process is so efficient that it allows us to make evaluative judgments “without having to think about it much, sometimes without really thinking at all” (Nosek & Banaji, 2009, p. 84). Conscious, deliberative processing is more resource-intensive of our cognitive capacity, and therefore it is typically reserved for unfamiliar situations. In familiar situations, it is more efficient to leave things on autopilot (for more on this functional analysis, see Macrae, Milne, & Bodenhausen, 1994; Macrae, Stangor, & Milne, 1994).

4.2.3 Interaction between conscious and unconscious processes

Another question that researchers have pursued is whether automatic processes are associated with behavior. Evidence suggests that, indeed, automatic processes predict behavior, and add to the prediction over and above controlled processes (Gawronski & De Houwer, 2014). Generally speaking, the effect of automatic processes tend to be observed in spontaneous behaviors, while the effect of controlled processes in deliberate behavior that requires intentional decision-making (Fazio, 2001; Strack & Deutsch, 2004). Additionally, automatic processes better predict behavior when cognitive resources are constrained, while controlled processes better predict behavior when cognitive resources are left unconstrained (Hofmann, Rauch, & Gawronski, 2007). Research also shows that individual differences play a role. Automatic processes are better predictors of behavior for individuals with intuitive thinking styles, whereas controlled processes are better predictors for individuals with rational thinking styles (Richetin, Perugini, Adjali, & Hurling, 2007).

In a more comprehensive analysis of the potential patterns of how controlled and automatic processes are related to behavior, Perugini, Richetin, and Zogmaister (2010)

describe seven possible patterns that are reported in empirical research (see Figure 4.1). The first pattern, single association, is the most common pattern. Here, researchers examine the association between a measure of automatic processing and behavior. The second pattern, the moderation pattern, is where researchers look for conditions of the relationship between automatic processing and behavior. These could be the personal moderators, situational moderators, or the type of behavior in question (see Perugini et al., 2010, for a review). According to the additive pattern, each process type predicts unique variance of the behavior. This pattern is usually more meaningful and more convincing of the validity of automatic processing than the previous ones. The next pattern, the interactive or multiplicative pattern, reflects a statistically significant interaction term of the two process types over and above their individual contributions. For example, Jordan, Spencer, Zanna, Hoshino-Browne, and Correll (2003) found that high explicit self-esteem, especially when combined with low implicit self-esteem, predicts narcissism. The authors argue that high self-esteem individuals therefore become particularly defensive when they harbor negative self-feelings unconsciously.

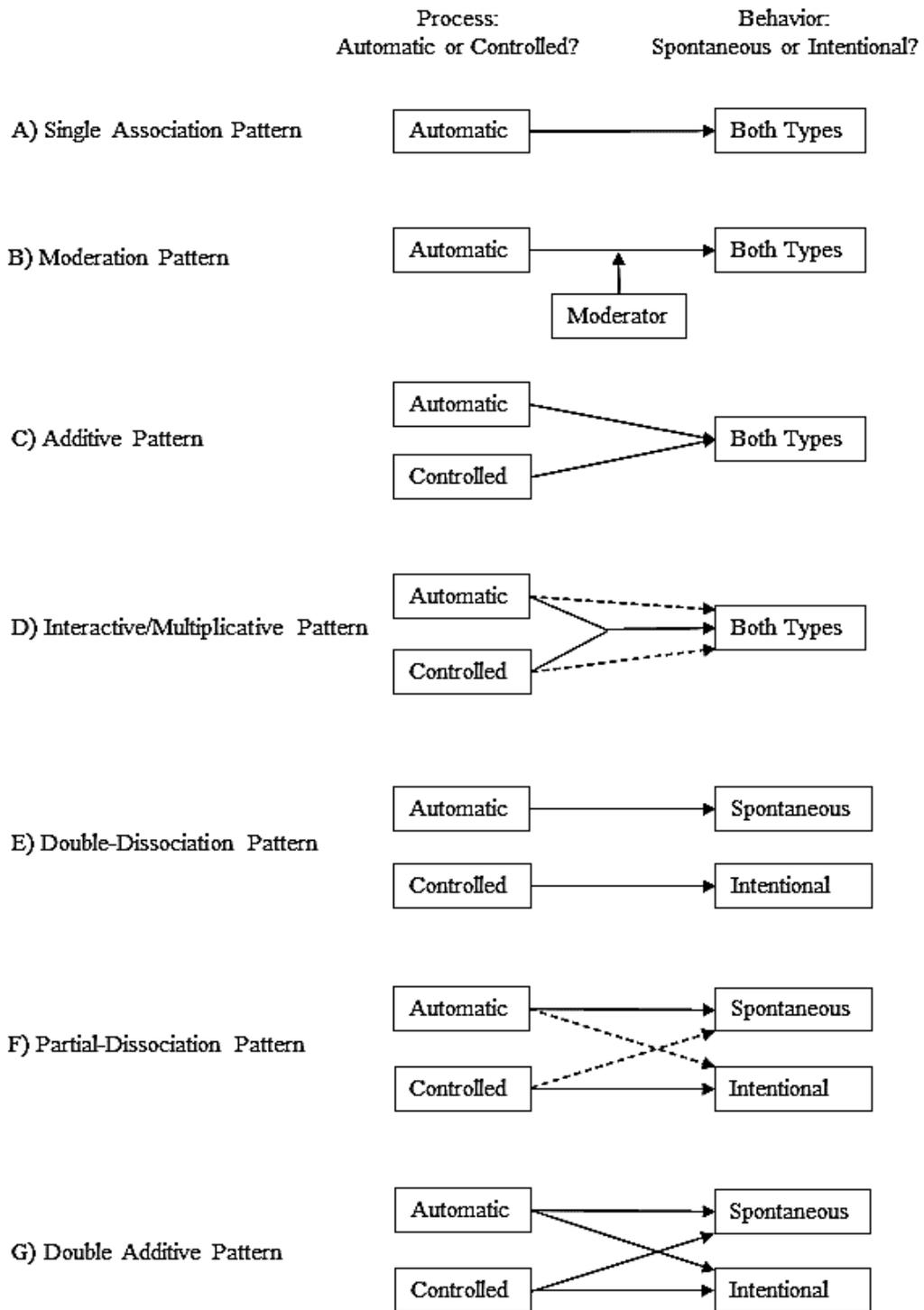


Figure 4.1: Seven patterns of the relationship of the two process types (automatic and controlled) with the two behavior types (spontaneous and intentional). Adapted from Perugini et al. (2010) with permission.

The double-dissociation pattern concerns the situation where automatic processing predicts spontaneous behavior, whereas controlled processing predicts more intentional behavior, but not vice versa. For example, Asendorpf, Banse, and Mücke (2002) found that implicit shyness predicts spontaneous (but not controlled) shy behavior, while self-reported shyness predicted controlled (but not spontaneous) shy behavior. The same pattern was obtained by Dovidio, Kawakami, and Gaertner (2002), who found that self-reported prejudice predicted verbal behavior with a Black partner, whereas spontaneous nonverbal behavior (e.g., eye contact and blinking) was predicted by implicit prejudice. The next pattern, the partial dissociation, is concerned with the situation where one type of processing predicts only one type of behavior, but the other type of processing predicts both. Therefore, only one of the two crossing lines in the figure is significant. For example, Richetin et al. (2007) found that implicit attitudes toward soft drinks predict spontaneous behavior (amount of consumption in a taste-and-rate test), while self-reported attitudes predicted both deliberate and spontaneous behaviors. Finally, the double additive pattern is where both processing types predict both types of behaviors. Perugini et al. (2010) report that this pattern is rarely obtained in empirical research. Perugini et al. (2010) maintain that outcome patterns that reflect additivity or dissociation constitute strong evidence that the two processes are valid and are qualitatively different because they lend support to the notion that there are two processes operating in the human mind. At a more exotic level, this dissociation may be akin to “a split in consciousness, such as mutually unaware person systems occupying the same brain” (Greenwald & Nosek, 2009, p. 65).

Gawronski and De Houwer (2014) explain that scholars have not been able to reach a level of understanding of these different patterns to allow them to expect a priori which pattern should be obtained. The authors therefore encourage future researchers to understand these patterns better. One account to explain the patterns of discrepancy between controlled and automatic processes is offered by Nosek (2005). According to Nosek, four factors moderate controlled–automatic relationships:

- a) self-presentation concern: the stronger the need to present oneself favorably, the weaker the controlled–automatic convergence,
- b) endorsement strength: the stronger the endorsement of the issue in question, the greater the convergence,
- c) perceived distinctiveness: the more distinctive one sees one’s views from the norm, the stronger the convergence, and

- d) dimensionality of the issue: the more multifaceted the issue, the weaker the convergence.

An alternative conceptualization of explicit–implicit moderators is offered by Friese, Hofmann, and Schmitt (2009), who classify moderators in terms of two dimensions. The first dimension is related to control (such as opportunity and motivation to control behavior), and the second is related to the disposition (i.e., of the person, the situation, or the behavior itself). Payne, Burkley, and Stokes (2008) also present empirical evidence showing that increasing the similarity in task demands, which they call ‘structural fit’, leads to higher explicit–implicit correspondence.

The inevitable conclusion from all of these empirical results and their theoretical implications is that, without taking unconscious motivation into account, a substantial proportion of the picture would be missing. Investigation of unconscious processes therefore seems a fruitful future direction.

4.3 Implicit motives

4.3.1 A bit of history

In his book *Fact and Fiction in Psychology*, Hans Eysenck (1965) presented a scathing critique of research into unconscious phenomena, which was then dominated by Freud's psychoanalytic paradigm. Eysenck maintained that,

... as has often been pointed out, the complexities of psychoanalytic reasoning effectively preclude any scientific testing of these theories. Furthermore, when we look at the evidence upon which Freud's theories are based, we find that it is not the kind which would recommend it to the scientist. Instead of experimentally tested deductions from clearly stated hypotheses, all that we find is anecdotal evidence collected in a relatively haphazard manner from individual case histories. This lack of true evidence is often disguised from the reader by the superb quality of Freud's writing, which deservedly won him the Goethe Prize in Germany, which is awarded for literary endeavor; however, in science persuasion should not take the place of proof... (Eysenck, 1965, p. 106)

In another book documenting the *Decline and Fall of the Freudian Empire*, Eysenck (1985) offered another round of critique of the psychoanalytic literature that developed out of Freud's work:

There is another reason which may lead us to wonder why psychoanalysis does so poorly, and which may help to explain this. As already explained, psychoanalysts tend to screen out their patients in such a way that only those most likely to benefit, and least seriously ill, are accepted for treatment. It would also seem, however, that many of those who go to the psychoanalyst are not in fact neurotically ill at all. For the majority of them, psychoanalysis constitutes what one critic once termed the 'prostitution of friendship'. In other words, unable because of defects of personality and character to make and keep friends in whom they can confide, they pay the psychoanalyst to serve this function, just as men buy sex from prostitutes because they are unable or unwilling to pay the necessary price of affection, love and tenderness which is needed to achieve a sexual relation on a non-commercial basis.... All these people, not being ill, cannot of course be cured; the habit of relying on the

psychoanalyst (like the habit of relying on priests, or astrologers, or witch-doctors) becomes self-perpetuating, and while the money lasts can be quite amusing. But all this has nothing to do with serious mental disorders of the kind we are considering. The psychoanalyst as prostitute or entertainer may not fit the self-important concept of the ‘healer’ developed by Freud and his successors, but it applies only too often. (Eysenck, 1985, pp. 71–72)

These critiques were circulating around psychologists, which led to attempts to reform research into unconscious motivation. Early on, Henry A. Murray (e.g., 1938) of Harvard University was trying to make the investigation into unconscious motives more systematic. He developed the Thematic Apperception Test (TAT, later called the Picture Story Exercise; see also Section 5.2.2 in the next chapter), which is a more systematic approach to study the type of free associations that Freud was interested in. Instead of asking the participant to simply speak whatever comes to his/her mind—as Freud would do—the TAT contains a series of ambiguous pictures suggestive of emotional complexities of everyday life (e.g., father–son relationships), and the participant is asked to tell *imaginative stories* to describe what is happening in each picture. Just like Freud, the idea here is that the participant’s own unconscious motives would be projected on these pictures. This fantasy-based approach is more disciplined in that the narrative stories of different participants can now be compared more systematically. Murray’s work has had another major contribution, namely the generation of “a vocabulary of human motives that has shaped work in the field ever since” (McClelland, 1987, p. 44). In contrast to dominant approaches, Murray’s approach could generate motives that are neither too few (e.g., only self-actualization as in the work of Carl Jung, Carl Rogers, and Abraham Maslow), nor too numerous to be manageable.

However, one drawback of Murray’s work was related to how to analyze the fantasy responses once they have been elicited via the TAT. Murray’s method was to assemble a group of experts to discuss and try to interpret the responses in order to arrive at the underlying motives. However, this intuitive approach was still not systematic enough as the biases of the individual judges might creep in. One solution offered by Cattell (1957, 1965) was the use of factor analysis, but still researchers first needed a way to decide which motive was represented by which statement, and this could not be done solely via statistical analyses.

4.3.2 Work by McClelland and colleagues

Work by David C. McClelland (e.g., 1987) offered a solution by devising a systematic coding scheme that allows researchers to follow explicit and objective procedures in deciding on unconscious motives (see Schultheiss & Pang, 2007; C. P. Smith, 1992; Winter, 1991, for practical guides). Because this procedure finally allowed researchers to systematically and objectively investigate unconscious phenomena, Heinz Heckhausen (1967) described it as a “breakthrough” (p. 2). In an early study on comparing projective stories and self-reports, McClelland and Atkinson (1948) conducted an interesting experiment in which they manipulated hunger in their participants to investigate how hunger is projected in stories. They compared three groups of participants who had not had food for 1, 4, or 16 hours. The researchers wanted to make sure that the participants were unaware of the purpose of the experiment. They recruited submariners, some of whom were assigned to their quarters in the afternoon, and so they could sleep late and participate in the morning, which was about 16 hours after their last meal. Two interesting results emerged from this study. First, self-reported hunger failed to distinguish between participants in the 4- and 16-hour conditions, but the projective test did distinguish between them. Thus, self-reported hunger was not as sensitive as the fantasy-based instrument. Second, the content of stories narrated by the participants did *not* emphasize food and eating per se as the participants got hungrier. Instead, they emphasized instrumental activity that can facilitate obtaining food. Indeed, “it is more adaptive for hungry people to think about ways of getting food rather than just passively dream of eating” (McClelland, 1987, p. 187).

Building on the concept of *needs* that was developed by Lewin (1935), Murray (1938), and then Maslow (1954), McClelland and associates initiated a research program following Freud’s assumption that childhood emotional experiences shape basic personality structure in adulthood unconsciously. This research led to the validation of three major implicit motives: need for Achievement (called *n Ach*), need for Affiliation (*n Aff*), and need for Power (*n Power*). McClelland (1987, pp. 213–214; Weinberger & McClelland, 1990) summarized research showing that these three motives orient, select, and energize behavior differentially—thus demonstrating that implicit motives measured with the TAT successfully discriminate among individuals. For example,

- as for the orienting function, individuals high in *n Ach*, when presented with words rapidly, recognize positive achievement-related words (e.g., success) more quickly

than negative ones (e.g., failure), while individuals high in *n* Power recognize power-related pictures more quickly than neutral ones; and

- as for the selecting function, those high in *n* Ach engage in entrepreneurial acts more frequently, those high *n* Power are involved in more arguments, and those high in *n* Aff perform more affiliative acts;
- as for the energizing function, a high *n* Ach score is related to improved performance in moderately difficult tasks, a high *n* Power score with faster learning of associations between pictures and words if they are power-related, and a high *n* Aff score with faster learning of complex networks of social relationships.

This predictive validity was interpreted as showing that different individuals are predisposed to different behaviors, or ‘preset’ to use McClelland’s term, in accordance with their implicit motives.

Further evidence in support of implicit motives comes from diverse paradigms including biological and neuroscientific. When it comes to biology, individual differences in implicit attitudes are related to health and disease through specific physiological mechanisms (McClelland, 1989). For example, a combination of high *n* Aff with low *n* Power is associated with type I diabetes, while a combination of *n* Power and life stress is associated with high blood pressure and respiratory infections. In addition, different motive states are presumably linked to different neurohormones, specifically *n* Aff to dopamine and *n* Power to norepinephrine. These findings led McClelland (1989) to conclude that implicit motives “play a causal role in health outcomes because they predict illness over a 10-year period and because changes in them produced by therapy precede health improvements” (p. 682). When it comes to neuroscience, those with a high *n* Power score exhibit greater electrical activity—as measured with electrodes attached to their scalps over the occipital area that receives visual sensations—to pictures representing power than did those with a low *n* Power score (McClelland, Davidson, Saron, & Floor, 1980). When presented with words that are neutral or power-related, individuals with high versus low *n* Power also exhibit different levels of electrical activity in response (Davidson, Saron, & McClelland, 1980). As McClelland (1987) put it, “The difference is in the receiving system, and not just in the verbal or motor response to motive-related cues” (pp. 213–214). Finally, in one longitudinal study that lasted for over a quarter of a century (McClelland & Pilon, 1983), mothers’ rearing practices when their children were five years old were compared with the TAT responses of these children after

the children became over 30 years old. The results show that *n* Ach scores correlate with scheduling of feeding and severity of toilet training at the age of five, while *n* Power correlates with permissiveness for sexual and aggressive behavior. These findings led McClelland to the bold conclusion that parents' overuse of disposable diapers could have serious ramifications on the child's achievement motive in later life. Such conclusions support Freud's position that very early experiences can shape personality in adulthood unconsciously. In a review of this line of research, Heckhausen (1967) stated clearly that, "According to present knowledge a direct relationship between achievement motivation and TAT content may be considered an established fact" (p. 13).

Just like the findings reviewed in the previous section, unconscious motives represent the affective dimension and predict spontaneous behavior over time, whereas conscious motives represent the cognitive dimension and predict immediate responses to specific situations. McClelland's explanation was that unconscious motives are sustainable because they stem from the pleasure of the activity itself, while conscious motives stem from the social incentives present in the situation. For this reason, McClelland distinguishes between what he called self-attributed (i.e., explicit) motives and between implicit motives. Another interesting idea in McClelland's approach is the distinction between *motive* and *motivation*. A motive, he argued, refers to the disposition or trait to behave in a certain way while motivation is the aroused state at a certain moment, and so the latter is the product of the former (McClelland, 1987). McClelland claimed that much confusion in the literature could be traced back to using 'motivation' in both senses, while in fact the aroused state could merely be a reflection of other non-motivational determinants—including values, skills, and opportunities—and not necessarily motive strength.

4.3.3 *Explicit–implicit correlation and conflict*

In an early study, deCharms, Morrison, Reitman, and McClelland (1955) tested the effects of explicit and implicit motives. The researchers tested their participants' implicit achievement motive through a fantasy-based measure, while their explicit achievement motive was tested through standard questionnaire ratings. The researchers found that implicit scores predicted performance on an anagram task, which is a classic measure of creativity that requires effort and concentration. On the other hand, self-reported value of achievement was associated with explicit impressions the participants made of a person they evaluated as being successful or not. These results led the researchers to conclude that explicit and implicit achievement motives predict different things: Implicit motives predict behavioral performance, while self-

attributed motives predict verbal attitudes and choices (see also Schultheiss & Brunstein, 2010a). deCharms et al. (1955) went even further to suggest that self-attributed motives might have unconscious sources:

This is clearly in line with the general notion that subjects who describe themselves as ambitious and achievant may do so for defensive reasons: they have perhaps been under some authoritarian pressure from their parents to be ambitious and the resultant motive which has originated in external sources shows itself primarily as a fear of being unsuccessful or at least as a disregard for those who are unsuccessful.
(deCharms et al., 1955, p. 419)

In any case, the results showed that explicit and implicit motives do not have to be correlated with each other. Implicit motives better predict long-term engagement in unstructured situations, but explicit motives predict short-term verbal reports and response to specific situational demands (Schultheiss & Brunstein, 2010a). This offered a reply to early critics (e.g., Entwisle, 1972; Fineman, 1977; Klinger, 1971) who questioned the lack of correlation between explicit and implicit motives.

Recent research has lent further support to the notion that explicit and implicit motives generally do not correlate with each other (e.g., Schultheiss, Yankova, Dirlikov, & Schad, 2009). However, it has further shown that, for some individuals, explicit and implicit motives do display a positive correlation. These individuals consequently experience ‘personality coherence’, which takes place when one embraces his/her ‘true self’ and its “deeply rooted affective proclivities” (Thrash & Elliot, 2002, p. 746). This explicit–implicit congruence predicts positive outcomes related to flow, volitional strength, identity, and well-being (e.g., Thrash, Maruskin, & Martin, 2012). In contrast, a lack of correlation between explicit and implicit motives is associated with fragmentation due to adopting social norms not compatible with one’s preexisting implicit values. This explicit–implicit incongruence is undesirable because success in long-term pursuits requires both (explicit) proactive organization of goals, as well as (implicit) spontaneous inclination to keep pursuing these goals (Thrash, Cassidy, & Maruskin, 2010).

Especially since McClelland’s death in the late 1990s, the popularity of implicit motives has somewhat waned. Nonetheless, some researchers are still actively investigating this area, most notably German psychologists Oliver Schultheiss and Joachim Brunstein (e.g., Schultheiss & Brunstein, 2010b). Recent research themes in this tradition have examined the

role of implicit motives in implicit learning (Schultheiss et al., 2005) and in episodic memory (Woike, 2008), and the role of certain hormones such as gonadal steroids (testosterone and estradiol) and cortisol in *n* Power (Stanton & Schultheiss, 2007) and progesterone in *n* Aff (Schultheiss, Dargel, & Rohde, 2003), and the role of certain brain areas including the amygdala, the striatum, and the orbitofrontal cortex (Schultheiss & Wirth, 2008). More detailed reviews of these developments are found in Schultheiss (2008) and Schultheiss, Rösch, Rawolle, Kordik, and Graham (2010). Thus, because of the recognition of its significance, “the implicit motive construct enjoys continued as well as newfound popularity among personality psychologists and also in other disciplines” (Schultheiss & Brunstein, 2010a, p. xvii).

Another notable legacy of McClelland’s work is found in the work of psychologist Dan McAdams, who was a student of McClelland and who has continued this tradition in a different direction. McAdams adapted McClelland’s story-based approach to the study of narrative identity. This research has shown that individuals integrate their life experiences into a coherent and evolving story of the self, which in turn have important implications on psychological development, adaptation, and well-being (for a recent overview, see McAdams & McLean, 2013).

4.3.4 Research on learning

Research has shown that implicit need for achievement is actually not associated with better grades at school; instead, the power motive is (McClelland, 1987, p. 258). McClelland argued that there is no theoretical basis to expect the two to be correlated because school environments do not generally foster taking the initiative to pursue one’s own goals in one’s own way (see also Heckhausen & Krug, 1982, p. 288). The power motive, on the other hand, does not require the activities to be pleasurable as long as they help attain one’s goal.

Nevertheless, some early researchers did try to deliberately induce achievement motivation in students in the hope that this would have a positive effect of their academic achievement. These training programs generally aim at helping students think, talk, and act like somebody with a high need for achievement (Alschuler, Tabor, & McIntyre, 1970; McClelland, 1972). McClelland (1972) reviewed the results from some interventions showing that achievement training did have a positive impact on both school grades and out of school activities (e.g., how they spent their time, worked, planned, and thought about their future), especially for boys. McClelland concluded that these results “leave little doubt that achievement motivation training can have fairly dramatic effects on school performance if it

is properly understood by teachers and integrated throughout the year with their regular classroom work” (McClelland, 1972, p. 132). In another study on university students, Elias and Rahman (1994) also found that achievement motivation training had positive effects both cognitively and affectively.

Another early intervention was conducted by deCharms (1976). deCharms distinguished between individuals who were *origins* versus *pawns*. This distinction has to do with the locus of causality; origins feel in control of their fate while pawns feel pushed around by external forces. As deCharms put it, “The motivational effects of these two personal states are extremely important. The Origin is positively motivated, optimistic, confident, accepting of challenge. The Pawn is negatively motivated, defensive, irresolute, avoidant of challenge. The Origin feels potent; the Pawn feels powerless” (deCharms, 1976, p. 5). McClelland (1987, p. 570) suggested that deCharms’s origin training approach incorporates some aspects of power motivation. The results of this intervention showed that students who received origin training outperformed the control group in standardized tests. They also showed more school discipline in terms of attendance and punctuality (see also deCharms, 1977).

More recently, researchers have raised questions whether the positive results from these early interventions reflect motive change per se, or just the acquisition of life management skills. An alternative approach that has recently been adopted by researchers in this tradition is to increase the *congruence* between explicit and implicit motives (Rheinberg & Engeser, 2010). Because motivation under explicit–implicit congruence does not require permanent volitional control and constant monitoring, it becomes easier to experience flow (cf. Csikszentmihalyi, 1975) and more general well-being. This approach therefore involves guided self-exploration of one’s own implicit motives (e.g., achievement, power, and/or affiliation), and then selection of explicit goals and activities that are congruent with these implicit motives. This approach constitutes a radical shift from modificatory to clarificatory training programs (see Rheinberg & Engeser, 2010, p. 540). In addition, this approach takes individual differences into account; motivational intervention has to be tailored to each individual’s implicit motives, rather than being ready-made and applicable to everybody. This is a rather new area of investigation and only future research will determine its effectiveness.

4.4 Contextual priming

4.4.1 A bit of history

In his book *Subliminal Perception: The Nature of a Controversy*, Dixon (1971) chronicles the debates and controversies that surrounded the question of whether it is possible to be influenced by a stimulus that is not consciously perceived. In his words,

If the importance of a hypothesis can be gauged from the number of experiments in which it has been tested, then that of subliminal perception must rank as one of the most important in the history of the science; but if its importance were to be judged on the basis of the attention given it in textbooks on psychology, then it would surely feature at ‘the bottom of the charts’. If the antiquity of the concept of subliminal perception is anything to go by, then it deserves to hold a prominent place in the history of psychology; but if what has been said about the concept, by those who doubt its validity, is the real criterion, then it should have been dead and buried a hundred years ago. (Dixon, 1971, p. vii)

Dixon goes on to survey thinkers who expressed their belief in subliminal perception as far back as 400 BC, including Democritus, Plato, Aristotle, and Leibniz. Dixon considers the mid-19th century to be the beginning of experimental research on this phenomenon. This early research appeared to lend support to the validity of subliminal priming. A century later, in the mid-1950s, the credibility of subliminal perception deteriorated sharply. Dixon attributes this to factors including concerns about the methodological robustness of previous studies (e.g., Eriksen, 1960) as well as the fear of the potential to exploit people commercially through this technique. J. V. McConnell, Cutler, and McNeil (1958) document the fear that this technique generated: “Seldom has anything in psychology caused such an immediate and widespread stir as the recent claim that the presentation of certain stimuli below the level of conscious awareness can influence people’s behavior in a significant way” (p. 229). The authors then explain that this controversy was primarily sparked when claims emerged that sales of Coca-Cola and popcorn increased among viewers of cinema motion pictures that used subliminal messages about these products. As the authors put it, these claims had “given rise to a series of charges and countercharges, the effects of which have reached the United States Congress and the Federal Communications Commission” (p. 229).

Subsequent methodological refinement gave further support to subliminal effects. As an illustration, one of the classic findings was initially reported by Otto Poetzl in 1910s (see Ionescu & Erdelyi, 1992). Poetzl observed that patients suffering from central vision loss first were able to report very little about a stimulus they were looking at, but after a while they started to gradually recall it better. Poetzl wondered whether this delayed perception would occur in healthy individuals as well. To examine this possibility, Poetzl presented his participants with a complex picture very briefly and asked them to draw it as exhaustively as they could. Although, as expected, the participants could recall few details about the picture, they were able to recall more details after they went home and ‘dreamt about it’. This effect was later on substantiated not only in dreams but also in free association images, and came to be known as the Poetzl phenomenon. By the 1990s, subliminal effects were mainstream in psychology. As Bornstein (1992) summarized it,

Twenty (or even ten) years ago a researcher arguing for the existence of subliminal effects was on the fringe of the discipline, on the outside looking in. Now a researcher arguing against the existence of subliminal effects is in that position, while the advocate sits squarely within the mainstream. (Bornstein, 1992, p. 12)

However, in the same year, a special issue in the *American Psychologist* (Loftus & Klinger, 1992) also examined another important question: How strong are the subliminal effects? The conclusion was that, although “the reality of unconscious processes is no longer questionable” (p. 761), the effect of the unconscious was limited to highly routinized activities that could do little without conscious processing. Therefore, the conclusion from that special issue was that the unconscious was ‘dumb’. (For more on the history of priming research, see Bargh, 2014; Trofimovich & McDonough, 2011.)

4.4.2 Work by Bargh and colleagues

John Bargh and associates have been actively investigating priming phenomena. Recently, equating ‘the unconscious’ with ‘subliminal priming’ has been criticized as unnecessary restriction. Expanding the scope of the unconscious, Bargh et al. (2010) define priming as “the passive, subtle, and unobtrusive activation of relevant mental representations by external, environmental stimuli such that people are not and usually do not become aware of the influence exerted by those stimuli” (p. 288). Notice that this definition covers both subliminal (unperceived) and supraliminal (perceived) stimuli. The focus has shifted from

lack of awareness of the stimulus itself to lack of awareness of the *effects* of the stimulus. What is unconscious becomes the unintentional consequences of the situation. Bargh et al. (2010) argue that this is not a new redefinition of the unconscious, but rather it is in line with original conceptualizations of prominent thinkers, such as Darwin and Freud, where the unconscious used to refer the unintended nature of the behavior or its consequences. Bargh et al. (2010) also argue that recognizing situational influences is in the spirit of some early motivation researchers, such as Kurt Lewin (e.g., 1935), where motivational dynamics were described in terms of ‘fields of forces’ impinging on the individual. Additionally, stimuli that appear subliminally but still have significant effects on humans are actually uncommon in nature, and so humans have instead evolved to deal with more salient primes. Therefore, “assessing the unconscious in terms of processing subliminal stimuli is analogous to evaluating the intelligence of a fish based on its behavior out of water” (Bargh & Morsella, 2008, p. 74).

That unconscious processes, just like conscious ones, can influence behavior but without awareness came to be known as the *automaticity principle* (Huang & Bargh, 2014). according to this principle, the “power of the situation in determining behavior is that the mere, passive perception of environmental events directly triggers higher mental processes in the absence of any involvement by conscious, intentional processes” (Bargh et al., 2010, p. 288). The first demonstration of this effect was obtained in a study by Chartrand and Bargh (1996), who were able to activate cognitive goals (to evaluate or to memorize) merely through exposure to certain words in an ostensibly unrelated task. That task required the participants to perform a scrambled-sentences exercise in which words related to either evaluation (e.g., evaluate, opinion, impression) or memorization (e.g., remember, retain, memory) were embedded. This priming task successfully influenced the participants’ recall in a subsequent task. In a following study by Bargh et al. (2001), different goals were similarly activated through an unobtrusive and ostensibly unrelated task. In a series of experiments, Bargh et al. found that achievement priming led participants to perform better in an intellectual task, cooperation priming led them to behave more cooperatively in a resource-management task, and high-performance priming led them to persist at the face of obstacles and to favor resumption of disrupted tasks even in the presence of more attractive alternatives. This demonstrates that self-regulation can be induced unconsciously. In all of these cases, each participant was quizzed during debriefing in order to make sure that s/he was not aware of the effect of the priming task. Participants in these experiments display no

awareness of the reasons behind their improved learning ability, or whether there is any improvement at all.

These findings have led to a new area in motivation science called *implicit motivation*. According to Ferguson, Hassin, and Bargh (2008), because the conscious regulatory capacity is severely limited and resource-intensive, implicit motivation evolved to make up for this limitation by helping the individual negotiate the social world automatically, without having to consciously deliberate every decision. However, implicit motivation cannot do this if it cannot adapt to the requirements of different situations. Being flexible and adaptable to new circumstances is obviously essential to successful goal pursuit, and if implicit motivation is inflexible it should be vulnerable to failure. While it was initially thought that implicit processing is slow and inflexible, recent research has shown that its interaction with “the dynamic, unfolding situation” is actually more flexible and adaptive than was previously expected (Ferguson et al., 2008, p. 154). Hassin, Bargh, and Zimerman (2009) conducted two studies to examine the flexibility of implicit motivation. In the first study, the researchers utilized the Wisconsin Card Sorting Test, which is a classic measure of adaptation to changing environments. This task consists of cards of varying colors (red, blue, yellow, or green), forms (stars, triangles, circles, or crosses) and numbers (one, two, three, or four). The participant has to sort each card according to color, form, or number. The participant is informed after each trial whether it was right or wrong, but s/he is never informed what the underlying rule actually is. After 10 consecutive correct sortings, the rule also changes without warning. The Wisconsin Card Sorting Test is therefore a test of flexibility in learning implicit patterns that change repeatedly. The results showed that participants in the high-achievement priming condition (primed with words like win, succeed, strive, master) adapted better to the changing task requirements than did those in the no-priming condition. In the second study, the researchers utilized a variation of the Iowa Gambling Task. This task is also a card game in which the participant has to maximize gains and minimize losses without being given the rule explicitly. Also, half the way through the task, the implicit rule changes without any warning. Just like the first study, participants in the high-achievement priming condition outperformed those in the no-priming condition. These results suggest that primed participants are better at disengaging from the old environment and learning the structure of the new one.

In another study, Eitam, Hassin, and Schul (2008) used a different approach to measure flexibility in implicit motivation. They used a simulation of a dynamic system represented by a sugar factory. The participants had to manage the factory by controlling the

number of workers to reach a production level of 9,000 tons. The sugar factory operated according to a dynamic probabilistic rule [$2 \times (\text{number of employees on trial } n) - (\text{tons of sugar on trial } n - 1) \times \text{noise}$], which the participants were not aware of. Again, the primed participants outperformed the control ones in adapting to the dynamic nature of the task. Crucially, the primed participants did not report any increase in explicit motivation, nor were they able to indicate explicit knowledge about the underlying rule.

4.4.3 Misattribution

In some priming studies, primed participants perform at a higher intensity, such as working harder or cooperating more. In these cases, they are neither aware that priming might have an effect on their behavior, nor that their behavior had been modified in any way. In some other priming studies, however, the participants are primed with a goal whose satisfaction requires choosing one of a number of alternatives. When primed participants do select the alternative that best helps them reach their unconsciously primed goal, they are not aware of the effect of the prime on their behavior, but they *are* aware of the choice they had made. Asking these participants to introspect about the cause of their behavior reveals interesting insights about the nature of cognitive biases and how individuals (mis)attribute the motivation behind their behavior.

In one of the first systematic analyses, Nisbett and Wilson (1977) conducted an extensive review and concluded that individuals typically report faulty accounts to explain their behavior, and sometimes even make assertions about mental events that they do not have access to. The authors therefore concluded that self-reported motives are questionable. In their words,

The evidence reviewed is then consistent with the most pessimistic view concerning people's ability to report accurately about their cognitive processes.... the evidence indicates it may be quite misleading for social scientists to ask their subjects about the influences on their evaluations, choices, or behavior. The relevant research indicates that such reports, as well as predictions, may have little value except for whatever utility they may have in the study of verbal explanations per se. (Nisbett & Wilson, 1977, p. 247)

Other researchers (Ericsson & Simon, 1980, 1984) have argued that verbal reports do not automatically qualify as scientific data without first satisfying certain conditions, such as

asking the participant to describe their successive cognitive processes (the ‘what’ question) rather than their motives and reasons (the ‘why’ question). This should also take place during the activity rather than afterward (e.g., via think-aloud protocols). Retrospective reports about general reasons risk contamination by memory traces retrieved from long-term memory. Instead, researchers should seek information from the short-term memory of the activity in question. The same issue arises in prospective self-reports. In reviewing research that has compared self-reports with objective measures of actual behavior, Back and Vazire (2012) report low to moderate correlations and conclude that there are “substantial blind spots” (p. 139) in personality self-views when individuals try to predict their own actual behavior.

Priming research shows that individuals tend to misattribute their behavior to some internal state, such as permanent dispositions or temporary preferences. In a study that specifically investigated this *post-priming misattribution process*, Bar-Anan et al. (2010) conducted a series of experiments that showed a striking sequence of events. The researchers demonstrated that (a) a primed goal can influence people’s behavior, (b) people then fail to recognize the effect of the prime, (c) they therefore misattribute their behavior to their internal state, and (d) this ‘confabulated’ internal state would then be incorporated into their self-concept and would influence subsequent behavior! The last point illustrates the *downstream effects* of post-priming misattribution, showing that unconsciously primed states may have longer-lasting effects than was first thought. This research also suggests that individuals sometimes *infer* the motives behind their own behavior from salient environmental factors—especially when the situation is ambiguous enough for individuals to rationalize in a post hoc manner—just like an outside observer would. As Gawronski (2009) put it, “what is sometimes regarded as the ‘privilege of self-knowledge’ may be nothing else than naïve theories about ourselves that are based on the same kinds of behavioural observations that form the basis of our knowledge about other individuals” (p. 141).

Research on choice blindness has shed some more light on this misattribution phenomenon. In a remarkable experiment, Johansson et al. (2005) asked their participants to decide which of two female faces they considered more attractive. After the participant had made their decision, the experimenter—with a sleight of hand—switched the pictures and, immediately, asked the participant to explain why they preferred the picture that they did *not* actually choose. Most participants did not detect the trick and, interestingly, went on to explain why the female face they ‘chose’ was more attractive. During debriefing, the researchers report that many participants expressed considerable surprise, and even disbelief, when they were told about the purpose of the study. In a subsequent study titled ‘Magic at the

Marketplace', Hall et al. (2010) set up a tasting venue at a local supermarket and invited shoppers passing by to try two varieties of jam and tea. Just like the previous study, the experimenter sneakily switched the two choices after the participant made their decision and then asked them to explain why they preferred the one they did not originally choose. Most participants failed to detect the mismatch between their actual choice and the outcome, and readily (mis)explained their 'choice' (see also Wegner, 2002, for similarly amusing experiments). These results show that the human mind is efficient in making up (faulty) explanations for one's behavior. Interestingly, when the reasons behind one's actions cannot be misattributed plausibly, such as when primed to behave in a norm-violating way, participants experience an 'explanatory vacuum', which leads to experience negative affect (Oettingen, Grant, Smith, Skinner, & Gollwitzer), which they might again misattribute (Bargh et al., 2010).

Conscious–unconscious dissociation has a neurological basis. According to Frith, Blakemore, and Wolpert (2000), while high-level control is housed in the prefrontal cortex, it is the parietal cortex that houses mental representations, thus making it structurally possible to have a high-order goal operating without a conscious representation of it (Bargh et al., 2010). Additionally, the brain contains 'mirror neurons' that allow one to copy another person's behavior automatically and unconsciously in what neuroscientist Vittorio Gallese (2003) calls the 'shared manifold of intersubjectivity'. These mirror neurons become active both when one engages in a type of action and when one perceives another person engaging in that action. These findings reopen "the behaviorists' hypothesis that the higher order responses of the human being can be directly put in motion by environmental stimuli" (Bargh & Ferguson, 2000, p. 928). In extreme clinical cases, such as the environmental dependency syndrome (Lhermitte, 1983, 1986), the patient loses all control of their behavior when a prime is present. This condition causes a disorder in personal autonomy, making the patient at the mercy of environmental cues. Seeing a bed means undressing and lying on it; seeing flowers and some water means watering them. Lhermitte recounts the startling level of submission to environmental cues in one of his patients:

Patient 2 and I sat down in my office. I put some medical instruments on my desk. She immediately picked up the blood pressure gauge and very meticulously took my blood pressure... After this she took the tongue depressor and placed it in front of my mouth, which I opened, and she examined my throat... Last, she picked up the reflex tester and, to make sure she tested the ankle jerks, I knelt down on the chair. When I

asked her what she thought, she said she was satisfied with my state of health.
(Lhermitte, 1986, p. 336)

Research on contextual priming is arguably one of the most controversial areas of motivational and social psychology, just as Dixon describes the controversy over subliminal perception in the opening quote of this section. John Kihlstrom, a prominent critic of the automaticity movement, dubbed the reemergence of the interest in the unconscious as a regressive situation (Kihlstrom, 2008b), as the automaticity juggernaut (Kihlstrom, 2008a), and as the rise of a ‘People are Stupid’ school of thought that portrays the individual as mindlessly swayed by instinctual drives and situational stimuli (Kihlstrom, 2004b). Because Kihlstrom’s critique is so passionate, I quote some of it:

Almost inevitably, the emphasis on how people are pushed around by situational factors led to a kind of ‘Candid Camera’ rhetorical stance in which social psychologists’ lectures and textbooks focused inordinately on just how ridiculous – how *stupid* – people can be, *depending on the situation* – a situation that, in many cases, has been expressly contrived to make people look ridiculous and stupid.... Behaviorism, with its emphasis on stimulus and response, did not survive the cognitive revolution, but the “positivistic reserve” (Flanagan 1992) that was part and parcel of behaviorism is still with us. As a result, we grudgingly accept intervening mental states and processes as necessary to the explanation of behavior – but we want them to be as mechanical as possible. We’ve replaced both the black box and the ghost in the machine with a clockwork mechanism that is as close to reflex activity as we can get and still pay lip service to cognitivism.... We had a cognitive revolution for this – only to be told that Skinner had it right after all? (Kihlstrom, 2004b, p. 348, original emphases)

Other detractors direct their criticism toward methodological issues (e.g., Newell & Shanks, 2014), failed replications (e.g., Doyen et al., 2012; Pashler, Coburn, & Harris, 2012), and potential publication bias (e.g., Vadillo, Hardwicke, & Shanks, 2016). Without doubt, this topic is going to remain an active and controversial area of research for a long time to come.

4.4.4 Research on learning

This research tradition has demonstrated that the mere passive exposure to certain stimuli can influence subsequent perception, motivation, and behavior. Some of this research has been conducted in the context of learning. For example, Radel, Sarrazin, Jehu, and Pelletier (2013) exposed their participants to a ‘barely audible’ conversation (i.e., just above the auditory threshold) to which the participants could not have attended because they were engaged in a cognitively-demanding task. When this conversation was about an intrinsically motivating activity reflecting enjoyment and satisfaction, the participants’ motivation was automatically activated so that they consistently outperformed their control counterparts both in solvable tasks and in perseverance in unsolvable ones. The researchers argue that research successfully eliciting unconscious motivation through situational cues has yielded “indisputable evidence” (Radel et al., 2013, p. 763).

Other research has shown that mere exposure to motivationally-charged words (e.g., aspire, excellence, ambitious) improves performance in subsequent, ostensibly unrelated, tasks. This priming process facilitates better learning of complex patterns of information as well as more efficient disengagement from the old environment in order to learn the structure of the new one (e.g., Eitam et al., 2008; Hassin et al., 2009). Other research has shown that priming students with the name of their parents increases self-rated goal commitment as well as actual effort exerted in a subsequent cognitive task (Fitzsimons & Bargh, 2003; Shah, 2003). Parents’ names are usually associated with striving for achievement, and so this research has found that this effect is moderated by reported closeness to parents. On the other hand, Hassin (2008, p. 579) reports results showing that priming mothers with the name of their young child, which activates the goal of going home and nurturing, reduces the pursuit of achievement goals.

Some investigators have tried to understand why passive priming can have an effect on learning. Early research on semantic activation suggests that priming leaves an unconscious residue in the brain (see Dörnyei, 2009c, p. 44). For example, an individual reading the word ‘window’ as part of a long list and then asked to complete the word ‘win...’ would most likely say ‘window’ even if s/he does not remember whether this word was originally on the list. Similarly, asking somebody to repeat the word ‘silk’ and then asking them ‘What does a cow drink?’ would most likely make them answer ‘milk’. However, it turned out that this activity is not restricted to just semantic activation, but also *conceptual* activation. For example, an individual instructed to read a list of insect names very carefully (and explicitly informed that this is a memory test) and then asked whether the word ‘insect’

was on the list, s/he would likely answer in the positive even if that word was not on the list (see Banaji & Greenwald, 2013). This happens because insect names activate the concept of insect. In a seminal study on this question, Higgins, Rholes, and Jones (1977) asked their participants to describe the ambiguous behavior of a person they read about. The participants that had been primed with positive versus negative words formed impressions about the target person that were congruent with their primes. Importantly, over half (55%) of the terms the participants used were not from the list of words they had been exposed to in the priming task. For example, some participants used ‘self-centered’ instead of ‘conceited’ and ‘daring’ instead of ‘adventurous’.

Going even beyond semantic and conceptual activation, more recent research shows that priming has perceptual, evaluative, emotional, motivational, and behavioral effects. Ferguson (2008) argues that priming leads to an *evaluative readiness* to pursue the goal as well as implicit positivity toward goal-facilitating objects. Primed learners would therefore become better predisposed to the learning goal and to what facilitates successful learning. In a way, this could make priming the unconscious counterpart of advance organizers (Ausubel, 1960). Bargh (2006) also argues that priming does not actually activate a single concept, but conceptual structures, since concepts “are not defined solely in terms of inherent properties; instead, they are defined primarily in terms of interactional properties” (Lakoff & Johnson, 2003/1980, p. 125). Priming therefore activates a network of related concepts that may help channel the learner’s attention and effort toward the learning goal, and away from distractors.

4.5 Implicit attitudes

4.5.1 A bit of history

About 150 years ago, Donders (1868/1969) made the proposal that, although mental processes could not be observed directly, psychologists could still investigate them through the speed of performance in response to different stimuli. Donders reported a number of experiments showing, for example, that using the right or left hand produced different lapse times depending on whether the stimulus was to the right or the left of the participant.

More recently, Anthony Greenwald and Mahzarin Banaji tried to adapt this technique in a grant proposal submitted in early 1994 (see Dasgupta, Greenwald, & Banaji, 2003). Later that year, Greenwald wrote the first computer program measuring the speed in associating *Flowers* with *Pleasant* and *Insects* with *Unpleasant* (see Banaji & Greenwald, 2013). Greenwald tried this test on himself, thus becoming the first ever person to take this test, and felt that this configuration was very easy to perform. However, when Greenwald switched the categories—i.e., associating *Flowers* with *Unpleasant* and *Insects* with *Pleasant*—the task suddenly became difficult! And no matter how many times he repeated this test, it remained difficult. He then shared it with other colleagues, and they also had the same experience.

Afterward, Greenwald used the same procedure but this time using the categories *Black* and *White*. He was disturbed to find that associating *Blacks* with *Pleasant* felt just as difficult as associating *Insects* with *Pleasant*. Some of his colleagues who took the test also reported the same experience. Reflecting on this experience, Dasgupta et al. (2003) explain that “Because of our deeply held beliefs about equal treatment, our own automatic responses were difficult to explain away. Now we could no longer talk about ‘those others’ who held negative attitudes toward disadvantaged groups” (p. 239). Therefore, a unique aspect of this test is that the experimenter can become a participant his/her own experiment.

A few years later, the first article using what came to be known as the Implicit Association Test (IAT) appeared (Greenwald, McGhee, & Schwartz, 1998). In this article, the researchers conducted three experiments assessing individual differences in implicit social cognition. The participants in these experiments consciously disavowed the racial implications of finding it hard to associate *Blacks* with *Pleasant*. As Banaji and Greenwald (2013) put it, “The Race IAT holds up a mirror in which many see a reflection that they do not recognize.”

4.5.2 Work by Greenwald and colleagues

Implicit (i.e., unconscious) attitudes are defined as “introspectively unidentified (or inaccurately identified) traces of past experience that mediate favorable or unfavorable feeling, thought, or action toward social objects” (Greenwald & Banaji, 1995, p. 8).

Psychologist Icek Ajzen describes this emerging field under the subheading *The promise of implicit measures*:

People tend to express socially desirable attitudes and to report possessing relatively favorable personality characteristics. These self-reports may, at a conscious level at least, indeed reflect what the [respondent] truly believes. With respect to some attitudinal issues and personality traits, however, explicit measures may be misleading or tell only part of the story. When it comes to socially sensitive issues or personality characteristics, implicit measures may reveal attitudes or traits that people are reluctant to admit even to themselves. (Ajzen, 2005, p. 18)

The first demonstration that implicit attitudes derived from the IAT are indeed a reflection of prejudice that individuals are reluctant to admit comes from a study of discriminatory behavior by A. R. McConnell and Leibold (2001). Unbeknownst to the participants, the researchers videotaped them interacting with two female confederates, one Black and one White, separately. The confederates asked each participant a number of questions and told a scripted joke. The behavior of each participant was then analyzed by judges who were blind to his/her IAT scores. The results showed that, indeed, the IAT scores correlated significantly with the judges' ratings of various discriminatory behaviors in interacting with the Black (vs. White) confederate, such as amount of speaking time, smiling, unprepared social comments, and speech errors and hesitations. In contrast, explicit measures of racial prejudice offered conflicting results.

Further research has shown that implicit attitudes could predict meaningful outcomes in a variety of domains, such as predicting the number of cigarettes smoked per day (Swanson, Swanson, & Greenwald, 2001), voting behavior for those who are still undecided (Arcuri, Castelli, Galdi, Zogmaister, & Amadori, 2008), and even suicidal risk (Harrison, Stritzke, Fay, Ellison, & Hudaib, 2014). A decade after the first IAT paper was published, Greenwald, Poehlman, Uhlmann, and Banaji (2009) conducted a meta-analysis of IAT 184 studies involving 14,900 participants. The researchers analyzed a range of criterion variables—including behavioral, judgmental, and physiological measures—and found that

the IAT scores exhibited a moderate correlation ($r = .274$). Explicit measures, on the other hand, showed an inferior effect size (e.g., $r = .12$ in interracial behavior). Because of these encouraging results, research on implicit attitudes “is exploding at a phenomenal rate” (Petty, Fazio, & Briñol, 2009, p. 3).

Some of this research has socially significant implications. Hugenberg and Bodenhausen (2003) have found that European Americans showed greater readiness to detect anger in Black faces when their implicit prejudice was high. In ‘real-life hiring situations’ that require subjective judgement while weighing the applicant’s various credentials, Rooth (2010) has also demonstrated that the probability of inviting male Arab-Muslim applicants to a job interview decreases when the recruiter has stronger negative implicit attitudes toward Arab-Muslim men. Other research has revealed an even darker side of everyday life. Reports indicate that police officers frequently misidentify unarmed Black people as hostile, tragically leading to fatal shootings. These reports have been supported by research using computer simulation games, in which Black people tend to be erroneously misidentified criminals (e.g., Greenwald, Oakes, & Hoffman, 2003). In this type of research, the participant is instructed to press a button to ‘shoot’ at criminals, who are holding guns, but not at citizens, who are holding benign objects such as a flashlight or a camera. Glaser and Knowles (2008) showed that this pattern is related to IAT scores. Equally disturbing is the finding that medical doctors also exhibit a similar pattern. Green et al. (2007) compared the explicit and implicit racial attitudes of medical doctors with their medical recommendations. At the explicit level, all doctors expressed equal preference for Black and White patients, as expected. At the implicit level, however, the more they favored White patients, the more they also offered them better medical recommendations (in this case, thrombolysis diagnosis for myocardial infarction). Thus, their behavior was in line with their implicit—not explicit—attitudes. Researchers examining this issue from the other side of the fence, so to speak, found parallel results. Penner et al. (2010) examined the experiences real-life patients. Their results showed that, after interacting with medical doctors with high implicit (despite low explicit) racial prejudice, “Black patients responded particularly negatively to medical encounters with [these] physicians” (p. 438). It is clear, therefore, that implicit attitudes can have serious consequences on everyday life. In a most disturbing study, Eberhardt, Davies, Purdie-Vaughns, and Johnson (2006) found that jurors are more likely to sentence to death a Black defendant in cases involving a White victim if the defendant exhibit more stereotypically African features (e.g., broader nose, thicker lips, darker skin). The researchers describe this phenomenon as ‘looking deathworthy’.

Neuroscientific research indicates that implicit and explicit attitudes are two distinct constructs. According to Cunningham et al. (2004), implicit attitudes correlate with activation in the amygdala, the brain region concerned with emotions, while explicit processing is associated with activation in the frontal cortex, the area responsible for control and regulation (see also Cunningham, Johnson, Gatenby, Gore, & Banaji, 2003; Phelps et al., 2000). Dasgupta et al. (2003) have drawn from such findings to make the argument that implicit attitudes are not ‘cold cognition’. Activation of the amygdala indicates that “the IAT was capturing something warm and affect-laden” (p. 241).

Despite the fact that implicit and explicit attitudes are related to activation in distinct areas in the brain, they seem to have some aspects in common. As for explicit attitudes, they have been known to develop in children early on through socializing with others, such as parents, and so the level of identification with parents moderates the intergenerational transmission of attitudes (Allport, 1954). Recent empirical research supports this process, which is akin to vicarious learning (Bandura, 1977), showing an association between children’s and parents’ explicit attitudes (for a meta-analysis, see Tenenbaum & Leaper, 2002). As for implicit attitudes, a very similar process has been observed. For example, Sinclair, Dunn, and Lowery (2005) found a correspondence between the implicit prejudice of children and that of their parents, and that this correspondence was influenced by the extent to which children identified with their parents. Still, the available research on the development of implicit attitudes is still in its infancy. While we already know that attitudes start forming very early, even before birth, through genetic factors (Bouchard et al., 2003), and through sounds heard while still in the womb (DeCasper & Spence, 1986), as well as a multitude of factors after birth (for a review, see Banaji & Heiphetz, 2010), little is known about which of these factors are also relevant to the development of implicit attitudes.

4.5.3 The validity of the Implicit Association Test

The IAT is arguably the most popular indirect measure of attitudes in contemporary psychological research. Because its popularity, the IAT has generated a sizable amount of literature utilizing it in various domains, thus permitting scrutiny of its reliability and validity. The reliability of the IAT is considered the highest among all other implicit measures of attitudes, with internal consistency and split-half reliabilities amounting to $r = .79$ across 50 studies in one meta-analysis (Hofmann, Gawronski, Gschwendner, Le, & Schmitt, 2005; see also Krause, Back, Egloff, & Schmukle, 2011).

As for the validity of the IAT, there is still continuing debate concerning what exactly the IAT is actually measuring. Some proponents of the IAT have also argued that its validity amounts to a ‘scientific certainty’ (Rudman, 2008), drawing from findings in various domains including consumer preferences, political preferences, personality traits, sexual orientations, and close relationships (see Greenwald et al., 2009). Proponents also cite the IAT’s known-groups validity. That is, research shows that the IAT is capable of correctly distinguishing among members of different groups in accordance with our a priori knowledge of them, such as reliably determining the participant’s gender, nationality, and even affiliation to a group artificially created in the laboratory (for a review, see Lane, Banaji, Nosek, & Greenwald, 2007).

The IAT also has its own critics. There is continuing debate concerning what exactly the IAT is measuring. Some critics have questioned the implicit attitudes construct. In the context of racial prejudice, for example, they argue that the IAT may represent shared cultural stereotypes rather than personal animus (e.g., Arkes & Tetlock, 2004; Gehring, Karpinski, & Hilton, 2003; Karpinski & Hilton, 2001). In addition, Oswald, Mitchell, Blanton, Jaccard, and Tetlock (2013) conducted a meta-analysis and criticized the IAT on the basis of overall poor prediction of relevant criterion measures and of being contaminated by irrelevant factors such as working memory capacity, task-switching skills, and other sources method-based variance (see also Ajzen, 2005; Fishbein & Ajzen, 2010). Oswald, Mitchell, Blanton, Jaccard, and Tetlock (2015) also argue that “IAT studies often rely on small-sample studies that predict criteria far removed from meaningful forms of discrimination (e.g., performance on a Stroop test or amygdala activation) in artificial situations involving strangers” (p. 565).

However, in Oswald et al.’s meta-analysis both explicit and implicit measures performed almost as poorly, in turn leading Greenwald, Banaji, and Nosek (2015) to criticize this meta-analysis for including correlations that have no theoretical basis. They also argue that these results actually lend support to the IAT’s discriminant validity. In addition, Greenwald et al. explain that even small effects can have substantial societal significance if they apply to a large section of the society or if they apply to the same person repeatedly, and thus “conventionally small (and even subsmall) effect sizes can have substantial societal significance” (p. 557). This is related to what Messick (1995) called *consequential validity* and to what Merton (1968) referred to as the *Matthew effect*, according to which the rich get richer while the poor get poorer. This debate is still ongoing (e.g., Carlsson & Agerström, 2016; Oswald et al., 2015).

Nonetheless, one limitation of the IAT is that it is a relative measure, and this sometimes makes its scores ambiguous. For example, if a participant obtains a score favoring the L1 group over the L2 group, this may mean that the individual possesses positive attitudes toward the L1 and negative attitudes toward the L2. However, other scenarios are equally possible, such as being indifferent about one group, or even possessing positive attitudes toward it but even stronger positive attitudes toward the other group. Similarly, a neutral score could mean that the individual is indifferent to the two groups, but this could also be due to possessing equally positive or equally negative attitudes toward each group. The relative nature of the IAT has led some psychologists to devise variations of it, such as the Single-Target Implicit Association Test. This discussion is presented in more detail in the following chapter (Section 5.3.2).

Finally, the active research on implicit attitudes and its consequences is becoming increasingly relevant to contemporary world affairs, including globalization and immigration. Dasgupta et al. express this idea as follows:

We believe that research explicating the relationship between intergroup familiarity and implicit and explicit prejudice is likely to be an important topic in the 21st century as globalization and immigration continue to change the demographics of the United States, and indeed many other countries around the world. (Dasgupta et al., 2003, p. 242)

4.5.4 Research on learning

A number of investigations have uncovered links between these processes and educational outcomes. For example, using a multilevel modeling approach, van den Bergh, Denessen, Hornstra, Voeten, and Holland (2010) examined the relationship between teacher's implicit prejudice (measured with the Implicit Association Test) and the achievement of minority students. Their results showed that the higher the implicit prejudice of the teacher, the lower the achievement of his/her minority students (and sometimes the *higher* the achievement of majority students!). This pattern was observed in both mathematics and text comprehension tests. Further analyses led van den Bergh et al. (2010) to conclude that this effect may be mediated by the teacher's different expectations for minority versus majority students. More specifically, teachers with high implicit prejudice tended to view minority students as less

intelligent and less promising. Unsurprisingly, explicit measures of prejudice failed to exhibit any of these associations.

van den Bergh et al. (2010) argue that, because teachers interact with their students for extended periods of time, implicit biases are bound to surface in everyday spontaneous behavior. Teaching is a demanding job, and so these biases could creep in even if the teacher does not intend it. The teacher might for example devote more time and attention to students s/he considers more promising, and might give them more challenging activities that would in turn help them learn the material better (the Pygmalion effect, Rosenthal & Jacobson, 1968). At the same time, the teacher might communicate subtle messages to minority students about their low ability, and this could have a substantial and long-term impact on them (the Golem effect, Babad, Inbar, & Rosenthal, 1982). According to these self-fulfilling prophecies, the teacher's *false* beliefs about the potential of different students (e.g., bright or dull) can materialize in actual achievement through the teacher's expectations and differential treatment. When these beliefs are based on *real* differences, they can also lead to the perpetuation of these differences (van den Bergh et al., 2010, p. 500). These effects has been validated in controlled laboratory settings (Reynolds, 2007).

Another line of research has examined the effect of stereotype activation on student performance. Since women are stereotyped to have inferior quantitative ability while Asians—especially in the United States—are stereotyped to have superior quantitative ability, Shih, Pittinsky, and Ambady (1999) combined these two stereotypes in a single study. The researchers recruited female Asians to complete a quantitative test. Before the test, the participants first completed a questionnaire that activated different aspects of their social identities. The participants whose female identity was activated performed worse, while those whose Asian identity was activated performed better, than a control group. The researchers also hypothesized that this effect has to do with the stereotypes that are associated with different identities, not identities per se, and so when they repeated this experiment in the Canadian context—where Asians are not stereotyped to have superior quantitative skills—the results replicated the gender activation effect but not the ethnic identity effect.

In a subsequent study, Ambady, Shih, Kim, and Pittinsky (2001) showed that this effect can also be observed in children as young as five years old. Among girls, activation of female identity impeded performance while activation of Asian identity facilitated it. Among boys, as expected, activation of either male or Asian identities led to better performance in comparison to a control group. In addition, susceptibility to stereotypes generally increased with age. This research shows that the subtle, unobtrusive activation of different social

identities can have an effect on cognitive abilities in subsequent learning tasks. In these studies, the researchers activated the different identities by merely asking the participants to answer a questionnaire about innocuous matters such as whether they preferred to live in a single-sex accommodation (female identity) or whether they had opportunities to speak languages other than English in their resident halls (Asian identity). With young participants, the researchers simply asked them to color a picture of a girl holding a doll or two Asians eating with chopsticks to activate the female and Asian identities, respectively. Explicitly, most participants denied that gender or ethnicity should have an effect on performance, suggesting that these influences are unconscious. This effect has been replicated in a recent, larger-scale study (Gibson, Losee, & Vitiello, 2014; for more on the stereotype threat effect, see also Gilovich, Keltner, & Nisbett, 2011, pp. 477–478).

4.6 Social desirability

4.6.1 *A bit of history*

In the early 1930s, Richard LaPiere of Stanford University went on a road trip with a Chinese couple. Considering the generally negative attitudes toward Orientals that surveys at the time showed, LaPiere was expecting that the Chinese couple would have a hard time finding a hotel to stay. However, the clerk of the first hotel they tried accommodated them without hesitation. Two months later, LaPiere called that same hotel to ask whether they would be willing to accommodate ‘an important Chinese gentleman’. The answer was unequivocally ‘No’.

A few years later, LaPiere documented his experience traveling across the United States with this Chinese couple (LaPiere, 1934). He reported visiting 66 hotels and other residential establishments and 184 restaurant and cafés. They were refused service only once. Six months later, LaPiere sent a questionnaire to the same establishments he had visited (as well as similar ones in their local area) asking: “Will you accept members of the Chinese race as guests in your establishment?” Over 90% replied ‘No’ and most of the remainder were ‘Undecided’. LaPiere concluded that on the basis of these questionnaire results Chinese people should not consider visiting the United States, but on the basis on actual experience Chinese people are actually very welcome in the country! This disparity led LaPiere to launch a harsh attack on the validity of questionnaire methodology and its ability to elicit valid data about the respondents’ attitudes. He argued that questionnaires generally ask rather hypothetical, abstract questions that have little to do with actual behavior. Here is how he explained his point:

Because it is easy, cheap, and mechanical, the attitudinal questionnaire is rapidly becoming a major method of sociological and socio-psychological investigation. The technique is simple. Thus from a hundred or a thousand responses to the question “Would you get up to give an Armenian woman your seat in a street car?” the investigator derives the “attitude” of non-Armenian males towards Armenian females. Now the question may be constructed with elaborate skill and hidden with consummate cunning in a maze of supplementary or even irrelevant questions yet all that has been obtained is a symbolic response to a symbolic situation. The words “Armenian woman” do not constitute an Armenian woman of flesh and blood, who might be tall or squat, fat or thin, old or young, well or poorly dressed—who might, in

fact, be a goddess or just another old and dirty hag. And the questionnaire response, whether it be “yes” or “no,” is but a verbal reaction and this does not involve rising from the seat or stolidly avoiding the hurt eyes of the hypothetical woman and the derogatory states of other street-car occupants. Yet, ignoring these limitations, the diligent investigator will jump briskly from his factual evidence to the unwarranted conclusion that he has measured the “anticipatory behavior patterns” of non-Armenian males towards Armenian females encountered on street cars. Usually he does not stop here, but proceeds to deduce certain general conclusions regarding the social relationships between Armenians and non-Armenians. (LaPiere, 1934, p. 230)

In another lucid account of his position, LaPiere stated that,

There would seem little to be gained from asking a man if his religious faith prevents him from committing sin. Of course it does—on paper. But “moral attitudes” must have a significance in the adjustment to actual situations or they are not worth the studying. Sitting at my desk in California I can predict with a high degree of certainty what an “average” business man in an average Mid-Western city will reply to the question “Would you engage in sexual intercourse with a prostitute in a Paris brothel?” Yet no one, least of all the man himself, can predict what he would actually do should he by some misfortune find himself face to face with the situation in question. His moral “attitudes” are no doubt already stamped into his personality. But just what those habits are which will be invoked to provide him with some sort of adjustment to this situation is quite indeterminate. (LaPiere, 1934, pp. 235–236)

This study provoked different reactions of scholars. For example, Ajzen and colleagues blamed the abstract nature of LaPiere’s question. They argued that in order for LaPiere to obtain more accurate results, he should have asked “Would you accept a young, well-dressed, well-spoken, pleasant, self-confident, well-to-do Chinese couple accompanied by a mature, well dressed, well-spoken... educated European gentleman as guests in your establishment?” (Ajzen, Darroch, Fishbein, & Hornik, 1970, p. 270). This logic subsequently led to the formulation of the *principle of compatibility* (see Ajzen, 2005; Fishbein & Ajzen, 2010). According to this principle, the relationship between attitude and behavior is governed by the level of specificity in relation to target, action, context, and time.

However, the attitude–behavior may be more complex than this (see Liska, 1975). For example, response biases have to be accounted for. As an illustration, Connelly and Ones (2010) conducted a meta-analysis comparing the accuracy and predictive validity of self-reports versus *other*-reports. Surprisingly, the results show that ratings by others yield “substantially greater” (p. 1092) predictive validity, especially when it comes to academic achievement and job performance. These results suggest that others can provide a more realistic perspective, while the individual’s self-reports are sometimes inflated by social desirability biases. This is what investigators found when they examined self-reports that could be verified independently, such as one’s weight and height. For example, obese and overweight adolescents tend to misreport their weight, and this misreporting is consistently in the direction of underestimating their weight, so that they look skinnier (Elgar, Roberts, Tudor-Smith, & Moore, 2005). Women of reproductive age also underestimate their weight, and this happens regardless of their age, education, race, or marital status (Brunner Huber, 2007). The misreporting is more frequently found in the responses of overweight individuals, who usually have a stronger desire to present themselves more positively. When height is reported, as might be expected, it is misreported in the opposite direction, so that people overestimate their height to look taller (e.g., Rowland, 1990). Although the magnitude of misreporting varies (e.g., see Spencer, Appleby, Davey, & Key, 2002), it is clear that the distortion is consistently self-enhancing.

While research on implicit attitudes in the previous section suggests that individuals may possess negative implicit attitudes toward *specific* social objects, social desirability proposes that some individuals have a more general tendency to present themselves favorably, and so they tend to exaggerate their views of themselves (e.g. in their questionnaire responses). An influential account of this tendency is offered by impression management theory, which proposes that people are actively striving to present themselves favorably to others (Tedeschi, Schlenker, & Bonoma, 1971). According to impression management theory, “it is not the actor’s own perceptions that matter so much as the actor’s beliefs about the impression that an observer gains” (Tedeschi et al., 1971, p. 690). Consequently, some individuals might tend to inflate their self-reports in order to obtain more favorable impressions from others. More crucially, impression management theory developed from cognitive dissonance theory (Festinger, 1957), and so individuals may not be consciously ‘fabricating’ their responses in order to deliberately enhance their self-image. Instead, they are probably engaged in an automatic process to resolve a dissonance that they are experiencing, without even being aware of it (e.g., I think I am good-looking, so I must be

skinny). Thus, this process is probably operating unconsciously. That these participants were unaware of this process may be supported by the fact that they were usually aware that their weight and height were going to be checked afterward and their self-reports verified, which should have functioned as an incentive to provide as accurate responses as possible. Based on this, it is not unreasonable to expect people to also provide similarly biased responses when it comes to other sensitive issues, such as their own motivation and diligence or their attitudes toward another ethnic or racial group, even when they intend to give truthful responses whose anonymity is guaranteed (Banaji & Greenwald, 2013). This has made social desirability an important consideration in self-report methodology in various disciplines (e.g., Perinelli & Gremigni, 2016).

In addition to being prone to self-enhancing biases (whether conscious or unconscious), self-report measures may also fail to detect inclinations and tendencies that respondents do recognize in themselves but genuinely reject due to ethical or moral reasons—but that may nevertheless influence behavior (Nosek, Greenwald, & Banaji, 2007). Some of these inclinations, such as a dislike of another ethnic community, come from everyday experiences in one's culture which are then unconsciously assimilated (Banaji, 2001). Therefore, one might feel a dislike toward a certain group, but at the same time also recognize the ethical consequences of this feeling and genuinely tries to suppress it at the explicit level.

4.6.2 Work by Crowne and Marlowe

An important contribution to the social desirability literature comes from the work of Crowne and Marlowe (1960). Crowne and Marlowe hypothesized that some individuals might have a stronger tendency to present themselves favorably, and so the researchers tried to devise a scale to measure this tendency. Their study recommended a list of 33 true–false statements related to behaviors that are socially undesirable but that people nonetheless typically engage in routinely. Examples included ‘I like to gossip at times’ and ‘I am sometimes irritated by people who ask favors of me.’ The idea is that individuals who score highly on the social desirability scale would have a tendency to exaggerate their responses to questionnaire items related to other areas as well.

Regarding the psychometric properties of the scale, Crowne and Marlowe (1960) showed the internal consistency of their 33 items was .88, and the test–retest correlation was .89. Subsequent tests of this scale also showed high reliability. For example, Holden and Fekken (1989) generated a coefficient of .78; on several administrations, Crino, Svoboda,

Rubinfeld, and White (1983) generated internal consistency coefficients ranging from .70 to .77, and test–retest correlations ranging from .86 to .89. Because of the length of this scale (i.e., 33 items), some researchers have tried to make shorter versions of it by dividing it into three subscales. However, in a large-scale study, Barger (2002) concluded that the shorter versions were inadequate. Barger also reviewed research showing that the social desirability scale predicts hypertension, cortisol levels, cholesterol, autonomic nervous system reactivity, lifetime psychiatric morbidity, and mortality following a cardiac event.

Despite the controversy surrounding social desirability (e.g., Barger, 2002; Johnson, Fendrich, & Mackesy-Amiti, 2012), a growing literature is showing that social desirability is associated with various meaningful outcomes. For example, being high in social desirability is associated with exaggerating the amount donated to charitable organizations (Bekkers & Wiepking, 2011; Lee & Sargeant, 2011) and with ageist stereotypes (Cherry, Allen, Denver, & Holland, 2015). It is also associated with women’s stereotypical attitudes toward sex workers (Long, Mollen, & Smith, 2012), with men’s smoking behavior (Dumitrescu, Badiță, Dogaru, Toma, & Duță, 2014), and with psychological distress in students (H. L. Smith, Robinson, & Young, 2007).

4.7 Conclusion

Just like the previous chapters, it seems appropriate to end this chapter with a positive note, highlighting the value of the conscious mind. Some scholars posit that what makes human uniquely different from other species is *shared intentionality* (Tomasello, Carpenter, Call, Behne, & Moll, 2005), which provides the motivation to share psychological states with others and to participate in collaborative activities. Another account of human uniqueness points to *future planning* (see R. W. Byrne & Bates, 2007), especially when it comes to social planning. This is clearly an important function of the conscious mind. (For a book-length discussion of the characteristics that are thought to make humans unique, see Suddendorf, 2013.)

In addition, most memory researchers now agree that the role of conscious, explicit memory is not to reproduce the past experiences exactly (i.e., the reproductive function), but to reconstruct past experiences alongside illusions and distortions (the constructive function), which in turn allows one to simulate and imagine future events (Schacter & Addis, 2007). It is therefore reassuring that, while the conscious mind travels between the past and the future, the unconscious mind auto-pilots moment-by-moment activities. In other words, “Unconscious processes make this time travel possible by keeping the individual adaptively in touch with the present, ‘minding the store’ while consciousness is away” (Bargh et al., 2010, p. 306).

The accumulating research supporting the notion that unconscious influences do play a critical role in human motivation is thus an attestation to Zoltán Dörnyei’s anticipation that unconscious motivation would be rediscovered before long.

Chapter 5: Measures of Implicit Attitudes and Motivation

Theory is constrained by the quality and versatility of measurement tools
—Nosek and Banaji (2001, p. 625)

5.1 Introduction

The previous chapter has reviewed different strands of research into unconscious attitudes and motivation. In many of these investigations, indirect measures were used to make inferences about implicit phenomena, without resorting to asking the participant directly. This chapter reviews the different instruments available and the mechanics of their implementation. Since such indirect measures are generally unfamiliar to language motivation researchers, this chapter aims to demystify these instruments. This chapter also discusses the Implicit Association Test and the Single-Target Implicit Association Test, since they are utilized in the research presented in the next chapter.

The introduction of measures of implicit attitudes has “captured researchers’ imaginations and dramatically shifted research priorities in the attitude field” making the move from explicit-only to implicit measurement “one of the most significant changes to occur in the attitude literature in the last 20 years” (Blanton & Jaccard, 2015, p. 338). In his summary of the distinction between explicit and implicit measures, Gawronski (2009) explains that the basic distinction does not lie in the notion that the outcome of implicit measures is always unconscious. For example, research has shown that individuals can anticipate their results on implicit tests but usually reject the implications of these results explicitly, thus leading to a lower correlation between the outcomes of explicit and implicit measures (Hahn, Judd, Hirsh, & Blair, 2014). Neither that implicit attitudes reflect one’s ‘true self’. The notion of true self has two contradictory interpretations. On the one hand, some would argue the true self is revealed when one fails to exert intentional control on behavior (such as while under the influence). On the other hand, others would argue that your true self is only revealed when you have full control over your behavior. Nor is it that implicit attitudes are stable while explicit attitudes are susceptible to change. Implicit attitudes are also malleable (see also Chapter 7).

Instead, Gawronski (2009) argues that the most basic distinction between explicit and implicit measures is that,

Drawing on generalised dual-process models of human information processing, several theorists argued that implicit measures provide a proxy for the activation of associations in memory regardless of whether these associations are regarded as accurate or inaccurate. Traditional self-report measures, in contrast, are assumed to reflect the outcome of a propositional validation process, which aims at assessing the (subjective) validity of these associations. (Gawronski, 2009, pp. 146–147)

Gawronski goes on to explain that, at the empirical level, implicit measures predict behaviors even when the underlying associations are rejected explicitly. This is especially the case in spontaneous behaviors and under cognitive load.

The implicit measures reviewed in this chapter are classified into two groups: traditional and modern. This classification does not seem to have been used in the literature before. It is used here because it would make the organization of this chapter more intuitive. It is not intended to imply that traditional measures are no longer considered valid.

5.2 Traditional measures

Before computers became widely available, researchers had developed ‘low-tech’ measures of implicit attitudes and motivation that required ingenuity and inventiveness. For example, Webb, Campbell, Schwartz, and Sechrest (1966) review some early ‘unobtrusive’ measures. One such approach is to ask the participant to solve a mathematical problem while being exposed to distractions of various types (e.g., related to anger, fear, or sex interests). Time needed to solve the mathematical problem could be used as an indication of interest in the content of the distractor. That is, the longer the time, the greater the interest. In another approach, each schoolchild is given a garden plot to tend to, as well as a common garden tended by all children. The amount of time spent on tending the private garden plot versus the general plot might be an indication of the individualistic and collectivistic orientation of the child, respectively. However, such time measures were not particularly popular before the age of computers. A Webb et al. (1966) put it, the “lack of general emphasis on time-duration methods is partly due to difficulty of measurement. For accurate observation, the hurly-burly conditions of a natural setting are damaging” (p. 135).

In this section, two major instruments are surveyed, the Matched-Guise Technique and the Picture Story Exercise. These two measures generated a rather substantial interest over the decades. Both are originally paper-and-pencil measures, though nowadays it is also possible to administer them on a computer or online. Generally speaking, these measures

require blinding on the participant's part, so that s/he performs the required tasks without knowing the real purpose of the experiment.

5.2.1 The Matched-Guise Technique

In the history of language attitudes research, some scholars recognized that publicly expressed attitudes might not tell the whole story about an individual's underlying feelings and beliefs. In a seminal study, Lambert, Hodgson, Gardner, and Fillenbaum (1960) introduced the match-guise technique (MGT) in the hope of uncovering 'private attitudes' concerning cross-cultural dispositions. In the standard MGT, participants listen to audio-recordings of speakers reading the same, neutral passage in two or more languages (or accents). The participants are then asked to act as judges of the personality of each speaker, a procedure akin to how people routinely try to form impressions of a person they listen to on the phone or on the radio. Unbeknownst to the participants, however, the 'different speakers' in the MGT are actually one speaker who is fluent in the languages in question. If a participant evaluates the personality of the speaker differently when they speak in a different language, this differential evaluation is presumed to reflect stereotyped characteristics of the respective language group.

Some interesting results emerged from the early wave of the MGT research. For example, in the initial study by Lambert et al. (1960), responses to the (indirect) MGT were compared with responses to (direct) attitudinal scales related to English Canadians versus French Canadians. When the correlations turned out to be low and non-significant, the researchers attributed this to the independence of the two constructs. Subsequent research showed some intriguing results. For example, research on French Canadians documented developmental changes, where French-Canadian children start off evaluating their own group more favorably but by the age of 12 this pattern reverses (Anisfeld & Lambert, 1964; Lambert, Frankle, & Tucker, 1966). In addition, research on sex differences showed that French-Canadian males favor models from the English community, but French-Canadian females prefer men from their own group as if, as Lambert (1967) put it, they are guardians of their culture. Extending this research to the United Kingdom, Giles (1971) found that speakers of the Received Pronunciation—a standard accent in England—were rated as more prestigious (e.g., intelligent, ambitious), while speakers of Welsh English as more socially attractive (e.g., humorous, good-natured). These results suggest that language and accent might factor in how one's personality is judged by others. In fact, "even a single vowel or

consonant sound, contrasting with others or with our expectations, can have evaluative repercussions on its utterer” (Giles & Coupland, 1991, p. 32).

Commenting on the reliability of the MGT, Lambert argued that,

The technique is particularly valuable as a measure of *group* biases in evaluative reactions; it has very good reliability in the sense that essentially the same profile of traits for a particular group appear when different samples of judges, drawn from a particular subpopulation, are used.... On the other hand, the technique apparently has little reliability when measured by test-retest ratings produced by the same group of judges; we believe this type of unreliability is due in large part to the main statistic used, the difference between an individual’s rating of a pair of guises on a single trait. Difference scores give notoriously low test-retest reliability coefficients although their use for comparing means is perfectly appropriate. (Lambert, 1967, p. 94, original emphasis)

Nevertheless, interest in the MGT after this early wave has fluctuated, and this may be attributed to two primary reasons (see Garrett, 2010; Garrett, Coupland, & Williams, 2003; Giles & Coupland, 1991). On the one hand, critics started to point out potentially problematic aspects of the MGT. For example, some questioned the comparability of ‘reading’ a passage to the typical spontaneous conversation people engage in everyday practice, while others doubted the value of the artificially contrived ‘neutral’ content that the MGT requires by design. On the other hand, although researchers conducted “a very considerable number of studies” (Garrett et al., 2003, p. 57) which amounted to an “empirical avalanche” (Giles & Coupland, 1991, p. 37), the results were sometimes disappointing. In Garrett et al.’s (2003) words, the results “have not, arguably, led to the emergence of the cumulative body of knowledge one might have anticipated. Overall, the results have been inconclusive” (p. 67). In addition to these two factors, the general climate since the cognitive revolution in psychology may have been unfavorable to further research into unconscious processes. Consequently, in the 1990s and the early 2000s, the MGT lost its popularity (Garrett, 2010), though the past few years have witnessed a renewed interest in indirect measurement of attitudes (Giles & Rakić, 2014) including some explorations into other innovative methods such as the Implicit Association Test (e.g., Pantos & Perkins, 2013).

Kircher (2016) offers a reader-friendly introduction to how to conduct a MGT experiment and the considerations that the researcher needs to keep in mind. Kircher

emphasizes the need to conceal the real purpose of the experiment from the participants. To achieve this, several speakers should ideally be used, and the order of their recordings should be shuffled so that recordings by one speaker do not appear consecutively. If it is not possible to obtain recordings from multiple speakers fluent in the languages in question, then recordings by the speaker should be separated by *filler voices*. This is done in the hope that the participants do not realize that some recordings were performed by the same speaker. After all, the purpose is to evaluate the personality of the ‘different’ speakers, and if the participants are aware that there is only one speaker, it may make little sense to evaluate the personality of the same speaker differently while reading the text in different languages.

Kircher (2016) also explains that the MGT experiment should also be preceded by *practice voices*. These are recordings by speakers other than the ones that read the texts in the different languages. The purpose of these practice voices is to familiarize the participants with both the text to be read and the practicalities of the evaluation. These practice voices are not included in the final analysis. Typically, the analysis involves the participants responses to two dimensions related to the personality of the speaker. The first dimension has to do with *status*, which refers to power, economic opportunity, and upward social mobility (e.g., intelligent, educated, ambitious). The second dimension has to do with *solidarity*, which refers to appreciation, belonging, and intimate friendship (e.g., kind, warm, likeable). The participant may then be asked to supply qualitative data in an open-ended manner. Some researchers have specifically asked their participants to guess the speaker’s occupation, as this has implications about the perceived status of the speaker. Finally, the experiment should end with awareness probes. This aims to find out whether any of the participants has discovered the actual purpose of the experiment, or noticed that the same speaker has read the text more than once. These participants are typically excluded from the analysis. Variations of this standard MGT procedure are reviewed by Garrett et al. (2003).

5.2.2 *The Picture Story Exercise*

The Picture Story Exercise (PSE, which used to be called the Thematic Apperception Test) is an instrument that aims to uncover the participant’s implicit motives. As reviewed in more detail in the previous chapter, research has pointed out three specific implicit motives: need for achievement, for power, and for affiliation. These motives have explicit counterparts, elicited via conventional self-report questionnaires, and may or may not be congruent with the implicit motives uncovered by the PSE. As also reviewed in the previous chapter, scores from self-report questionnaires better predict controlled, or declarative, behavior. On the

other hand, scores from the PSE better predict spontaneous non-declarative behaviors, such as non-verbal (e.g., gestures, facial expressions) and para-verbal (e.g., fluency) behaviors (Schultheiss & Pang, 2007). For example, self-attributed achievement motivation may predict one's decision to take part in a certain exercise, but the PSE would predict actual performance and persistence during that exercise.

In the PSE, the participant is presented with a series of pictures. Each picture depicts a situation that is relatively ambiguous and open to interpretation. For example, one picture may show a young male staring blankly into the window and a female figure standing in the background. Another picture may show two or three people engaging a conversation or working on some project. The participant's task is to make up a narrative story to describe what might be going on in the picture. The participant may, for example, describe who these people are, their relationship with each other, their plans, thought, and feelings, and what might have happened before or may happen next. The participant is instructed to be as creative as possible. The rationale behind the PSE is that individuals project their own motives in the imaginative narrative stories they make up. These stories are subsequently coded by the researchers in order to determine the motives underlying each story (C. P. Smith, 1992).

As Schultheiss and Pang (2007) summarize, the achievement motive is represented by themes related to competition with a standard of excellence. This might reflect a success-approaching orientation or a failure-avoiding one. The power motive, on the other hand, has to do with themes related to control and influence over others. Again, this might reflect a positive desire for power or a fear of weakness. Finally, the affiliation motive is concerned with relationships and connections with others. Here also, there are two tendencies, one relates to the desire to attain and maintain social relationships, while the other is concerned with the quality and intimacy of these relationships.

In order to make this discussion more concrete, consider the following two stories, which were originally provided by psychologist Heinz Heckhausen. The two stories were written, originally in German, by two individuals in response to a picture portraying a student standing in front of a teacher next to the blackboard:

An apprentice in training is being queried by his teacher. During class, questions are asked that need to be answered by the apprentice. While the teacher is waiting for the answer, the apprentice wants to give the right answer. After answering the question, the apprentice is dismissed. Another one follows.

A teacher testing a student; the student stands at the blackboard. Recently, the student's grades have been really bad and the student's progression into the next grade is at stake. Therefore, the teacher is testing him. Confronted with the task, the student is helpless. The teacher is frustrated. The teacher waits for the correct solution of the task. The task has not been solved; the student needs to repeat the grade. (Schultheiss, 2001, p. 104)

In both stories, the need for achievement is manifested. However, the difference is striking. The first story interprets that achievement motive with a success theme. It also involves a reference to a desire for achievement: "the apprentice wants to give the right answer" and successfully achieving it. The other story, on the other hand, reflects a failure theme. It contains an incident of failure: "the student's grades have been really bad" as well as an instance of a negative affect: "the student is helpless."

A major disadvantage in using the PSE is its practicality. In the SPE tradition, researchers have to follow detailed and thorough protocols in coding stories to extract motive categories. Each story also has to be coded manually, preferably by more than one coder, since this process cannot be automated. This process requires a considerable amount of time and effort. For example, Schultheiss and Pang describe their experience:

On average, an experienced scorer needs 2–5 minutes to score one PSE story, not counting the time needed to determine word count (this task can be assigned to a research assistant). Thus, for a typical research sample of 80 participants who are administered a six-picture PSE, an experienced coder will need between 16 and 40 hours to code all materials, plus some additional time to review the assigned scores. This is certainly a large time investment, but it is necessary to obtain valid motive scores. (Schultheiss & Pang, 2007, p. 336)

Schultheiss and Pang also argue that each rater should first undergo at least 12 hours of training using practice materials before conducting the actual analysis.

Thus, on the surface, the coding protocols followed in the PSE are akin to an everyday qualitative analysis. However, this analysis must follow detailed guidelines in order to be reproducible. While the coding protocols show generally satisfactory levels of interrater and test–retest reliability, there is some controversy about their internal consistency.

Cronbach's alpha tends to be in the range of .20–.50 only (Schultheiss & Pang, 2007). However, some researchers have argued that internal consistency is not appropriate for this type of test (Atkinson, Bongort, & Price, 1977). That is, because motives are dynamic rather than static, once a motive is expressed in an imaginative story in response to one picture, this motive becomes satiated and so it drops down for some time. More recently, Gruber and Kreuzpointner (2013) have demonstrated that internal consistency reliability can be improved by using category-scores as items rather than picture-scores.

In terms of practical administration, a number of publications have offered suggestions (e.g., Gruber & Kreuzpointner, 2015; Lundy, 1988; Schultheiss & Pang, 2007). Most notably, it is recommended that cues be presented non-verbally, such as via images, rather than via verbal descriptions. Each image should only be shown to the participants briefly (around 10–15 seconds) and then removed. The participants then start writing their stories for around five minutes. The number of images used should be around 4–5 only. Using more than eight images leads to participant fatigue and consequently lower validity.

5.3 Modern measures

With the advent and accessibility of computers, a number of measures have been developed to tap into implicit cognition (e.g., de Houwer, 2006; Fazio & Olson, 2003; Gawronski, 2009; Gawronski & De Houwer, 2014; Nosek, Hawkins, & Frazier, 2011; Wittenbrink & Schwarz, 2007). These measures cannot typically be administered in a paper-and-pencil format because they require accurate measurement of reaction times. Generally speaking, because they measure reaction time, these instruments tend to be resistant to faking to some extent even if the participants are informed of the purpose of the experiment in advance (e.g., McDaniel, Beier, Perkins, Goggin, & Frankel, 2009; Payne, Cheng, Govorun, & Stewart, 2005). This section describes the Implicit Association Test, which is arguably the most popular measure of implicit attitudes. It then describes one variant of this test, namely the Single-Target Implicit Association Test.

5.3.1 The Implicit Association Test

At present, the most widely used measure of implicit attitudes is the Implicit Association Test (IAT, Greenwald et al., 1998). The IAT is a computerized reaction-time measure that simply requires classifying a series of words to the right or left as fast as possible. As an illustration of how this test works, Figure 5.1 gives an example of the Flower–Insect IAT. This test measures how strongly the participant associates flowers and insects with good and bad. In

the first part of the test (Figure 5.1A), a stimulus appears in the middle of the screen (e.g., *Roses*) and the participant has to decide which box this stimulus belongs to and then press one of two designated buttons on the keyboard. In Figure 5.1A, *Roses* belongs to *Flower*, and so the correct answer is the left box. Afterward, another stimulus appears (say, *Butterflies*) and, again, the participant has to decide which of the four categories the stimulus belongs to in order to classify it to the correct box. The stimuli may belong to *Flower* (e.g., roses, orchids, tulips), *Insect* (e.g., cockroaches, mosquitoes, wasps), *Good* (e.g., smart, friendly, clean), or to *Bad* (e.g., dumb, enemy, dirty).

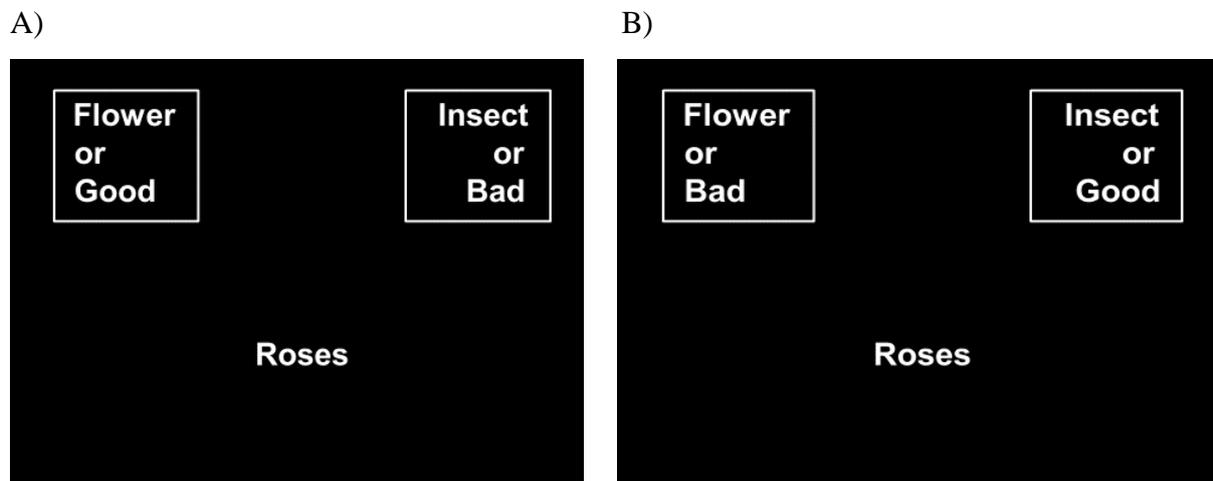


Figure 5.1: An illustration of the Flower–Insect IAT.

Note that this is not an attitude test per se. The stimuli are shown to the participant in advance with their correct categorization and, if they misclassify a stimulus, they get an error message immediately. The participant’s task is not to guess (or express their attitude about) the correct response, but to simply perform the test as fast as possible. Most participants therefore find the configuration in Figure 5.1A very easy to perform and breeze through it.

In the second part of the test (Figure 5.1B), *Flower* is paired with *Bad* while *Insect* with *Good*. This part suddenly feels considerably harder. This is because, in the first part, *Flower* and *Good* form one higher category (e.g., pleasant things), and *Insect* and *Bad* form another category (e.g., unpleasant things). Therefore, the participant in effect classifies the stimuli into only two—rather than four—categories (i.e., simply move all pleasant things to the left and unpleasant things to the right). In the second part, however, the participant has to sort the stimuli into the four categories (neither of the two pairs readily merges into one

intuitive category), and so the task requires substantially more cognitive resources, resulting in slower performance.

This is why the two parts of the test (as in Figure 5.1) are conventionally described as ‘compatible’ and ‘incompatible’, respectively. Compatible tasks are those that the researchers expect most participants to find easier (e.g., Flower–Good), while incompatible tasks are those that participant may find harder (e.g., Flower–Bad). This description also hints at why it is called the Implicit Association Test: *implicit* because participants find it hard to anticipate which configuration would be more difficult and are usually surprised by their own results, *association* because it measures the strength of the association of the categories in each pair, and *test* because it is a test of the participant’s performance speed. To the extent that categories of interest are paired with evaluative adjectives (e.g., good, bad), implicit attitudes are inferred from the response speed in the two parts of the test. The IAT is also flexible and can be easily adapted to measure implicit associations about various social objects, such as racial prejudice (e.g., White–Good, Black–Bad) and gender stereotypes (e.g., Male–Work, Female–Home). A discussion of the reliability and validity of the IAT has been presented in the previous chapter (see Section 4.5.3).

Regarding the scoring algorithm used to analyze latencies in the IAT, the original article by Greenwald et al. (1998) used the so-called *IAT effect*. The IAT effect calculates IAT scores by deducting the average latencies in the two main blocks in the test (i.e., the compatible and incompatible blocks). IAT latencies are also log-transformed before the analysis. Subsequently, Greenwald, Nosek, and Banaji (2003) systematically compared the performance of five candidate scoring algorithms: mean, median, log, reciprocal, and *D*. The analysis tested each of these five candidate algorithms in relation to various criteria, including correlation with self-report and internal consistency. Their results showed that the *D* scoring algorithm outperforms the other approaches. Calculating the *D* algorithm requires obtaining the difference between the compatible and incompatible blocks and then dividing by their pooled standard deviation. No log-transformation is required, but error trials are replaced with the mean of the respective block plus 600 ms error penalty. Because this approach is very similar to how Cohen’s *d* effect size is calculated, Greenwald, Nosek, et al. (2003) chose to call their algorithm *D* in uppercase to acknowledge this similarity. Currently, this is the standard procedure to analyze IAT scores (though see Blanton, Jaccard, & Burrows, 2015, for a critical perspective).

Lane et al. (2007) offer an introduction to the considerations that researchers need to keep in mind when constructing IATs. Lane and colleagues point out that stimuli are

interpreted in context rather than in isolation. For example, while the names Albert Einstein and Adolf Hitler are generally considered positive and negative symbols respectively, they both acquire negative valence at a British–Foreign IAT performed by British individuals (De Houwer, 2001). This is because individuals typically evaluate concepts favorably when the concepts relate to themselves, and both Albert Einstein and Adolf Hitler are evaluated negatively for being foreign. In other words, individual stimuli have no inherent valence and are only meaningful in the context of the target category under which they fall. Similarly, Mitchell, Nosek, and Banaji (2003) used as stimuli names of (well-liked) Black athletes and (disliked) White politicians. Their participants evaluated the Black athletes favorably in the context of occupation, and unfavorably in the context of race. Mitchell et al. (2003) therefore argue that “continuous, online constructions... are inherently flexible and contextually appropriate, despite being outside conscious control” (p. 455). The researchers also conclude that, with context variation, “multiple evaluations of an attitude object may be evoked, but none of those evaluations is more true than any other” (p. 468).

Lane et al. (2007) also explain that, since the IAT is a reaction-time measure, the stimuli selected must be very clear so that they can be recognized easily and quickly. This helps minimize variation that is merely an artifact of some idiosyncratic characteristic of a certain stimulus rather than an implicit association per se. This also applies to the use of negatively-worded items, such as ‘unintelligent’. Furthermore, the number of stimuli used is not crucial, and can range anywhere between 4 and 25 items. Instead, it is the number of trials in the test that matters the most, with 40 trials per test block showing adequate psychometric properties. Lane et al. (2007) therefore emphasize that “better construct validity will be obtained when researchers select the exemplars that best capture the construct of interest rather than trying to generate a longer list of exemplars that are not high-quality representations of the category” (p. 88).

Regarding counterbalancing, there are at least two aspects where counterbalancing is relevant (Hofmann et al., 2005; Lane et al., 2007). The first is whether explicit and implicit measures should be counterbalanced; the second is whether the compatible and incompatible blocks within the implicit test should be counterbalanced. A meta-analysis by Hofmann et al. (2005) showed that order of explicit and implicit measures has little effect on responses to either measure. When it comes to counterbalancing blocks, the results showed that there is a minor effect of counterbalancing. Lane et al. (2007) therefore recommend that researchers counterbalance when the interest is finding out the overall magnitude of the IAT effect. On the other hand, when IAT scores are used as a predictor or a criterion variable, the variability

introduced by counterbalancing can potentially mask real effects. Lane and colleagues therefore recommend fixing the order of blocks and not counterbalancing in this situation.

At the time writing, IATs related to various social topics are hosted at the Department of Psychology at Harvard University (see www.implicit.harvard.edu). These tests are available free of charge and are managed by psychologists from Harvard, Washington, and Virginia Universities.

5.3.2 The Single-Target Implicit Association Test

As reviewed above, the IAT measures the association between two categories (e.g., insects and flowers) and two attributes (e.g., good and bad). However, this makes IAT scores relative. The exact interpretation of IAT scores becomes ambiguous. To give a more concrete example of this limitation, consider an IAT related to attitudes toward the L1 group versus the L2 group. If a participant obtains a score favoring the L1 group, the first scenario in Table 5.1 is the one that usually comes to mind. However, each of the other four scenarios is also plausible. In fact, as in the fifth scenario in Table 5.1, the individual might actually hold *negative* attitudes toward the L1 group, but his/her attitudes toward the L2 group are even more negative (Karpinski & Steinman, 2006; Nosek & Banaji, 2001).

This ambiguity also applies to neutral scores. If a participant obtains a score showing no preference to either group, one might be tempted to think that the participant is indifferent to either group. However, the participant could have equally positive attitudes toward the two groups, or even equally negative attitudes toward them.

Table 5.1: Possible interpretations of an IAT score favoring the L1 group over the L2 group.

Scenario	Attitudes toward L1 group	Attitudes toward L2 group
1	Positive	Negative
2	Positive	Neutral
3	Very Positive	Positive
4	Neutral	Negative
5	Negative	Very Negative

The relative nature of the IAT has led some psychologists to devise variations of it, such as the Single Target Implicit Association Test (Wigboldus, Holland, & van Knippenberg, 2004), the Single Category Implicit Association Test (Karpinski & Steinman,

2006), and Single-Attribute Implicit Association Test (Penke, Eichstaedt, & Asendorpf, 2006). Generally, these variations revolve around dispensing with the contrasting category and sufficing with the category of interest.

As an illustration, to test implicit attitudes toward flowers, the IAT requires another category to contrast with, such as insects. With the Single-Target Implicit Association Test (henceforth ST-IAT), the target category (i.e., flowers), would be enough on its own (see Figure 5.2). In the first condition (Figure 5.2A), *Flowers* is paired with *Good*, while in the second condition (Figure 5.2B) it is paired with *Bad*. Following the same logic as the IAT, response speed in the two conditions is compared, and faster performance implies stronger implicit association between *Flowers* and the respective attribute. The advantage of this approach is that it can deal with situations where the researcher is unable to find an obvious contrasting category, or where different contrasting categories lead to different results (cf. Karpinski, 2004; Nosek & Banaji, 2001). More importantly, it promises an absolute, rather than relative, score (though not in the purest sense; see Karpinski & Steinman, 2006).

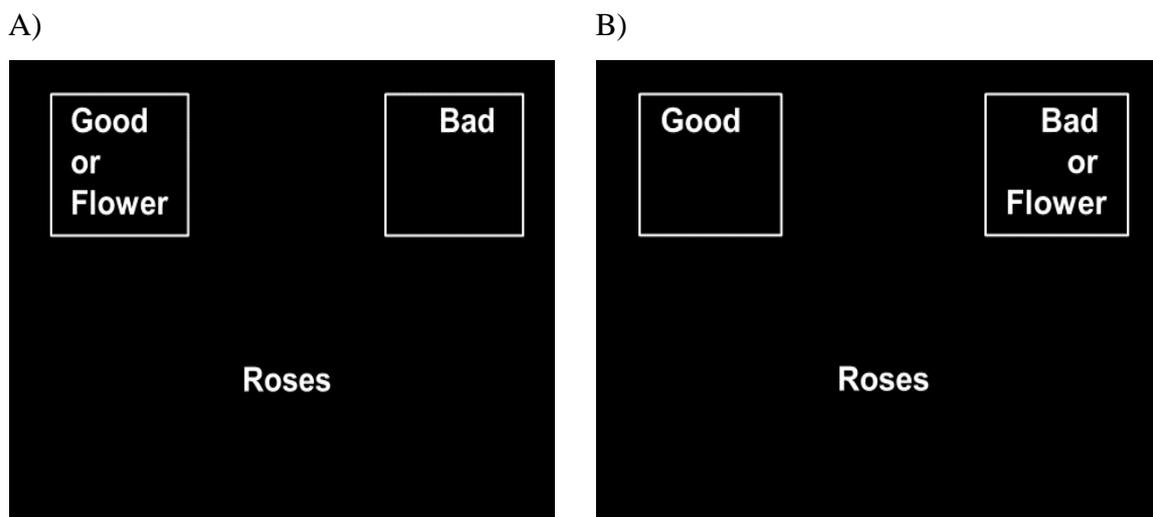


Figure 5.2: An illustration of the Flower ST-IAT.

In an early test of the ST-IAT, Wigboldus et al. (2004) provided evidence that the ST-IAT may indeed be an absolute measure. In their study, ST-IATs for attitudes toward Christianity and Islam correlated with explicit scales related to Christianity and Islam respectively, but the IAT did not. In contrast, the IAT correlated with a relative explicit measure of Christianity versus Islam, but the ST-IATs did not. In another study by Karpinski and Steinman (2006), the researchers tested the ST-IAT in three different attitude domains: soda brand preferences, self-esteem, and racial attitudes. Their results showed that the ST-

IAT shows satisfactory levels of internal consistency reliability. Their results also showed that the ST-IAT maintains its predictive validity even after controlling for both IAT scores and explicit ratings. In a third study by Penke et al. (2006), the researchers tested attitudes toward sociosexuality, or the tendency to engage in uncommitted relationships, using both the IAT and the ST-IAT. The results showed that both tests obtained satisfactory reliability. However, the ST-IAT correlated more strongly with explicit attitudes toward sociosexuality than did the IAT, thus again lending support to the rather absolute nature of scores derived from the ST-IAT. Other implicit measures have been also devised. Nosek et al. (2011), for example, review 20 different ones (for detailed methodological reviews, see de Houwer, 2003, 2006; Fazio & Olson, 2003; Gawronski & De Houwer, 2014; Kihlstrom, 2004a; Wittenbrink & Schwarz, 2007).

Still, despite the limitations of the IAT (which the ST-IAT tries to address), the IAT is still dominant. The vast majority of research on implicit attitudes uses the IAT (for a survey, see Nosek et al., 2011). This is why the research presented in the following chapter utilizes both tests.

5.3.3 Flexibility of modern measures

The flexibility of the modern measures has facilitated expanding the scope of research on attitudes and motivation. While traditional measures were able to provide relatively limited information in specific domains, modern measures can be easily adapted to suit a variety of research questions.

As an illustration, consider gender differences. Language learning research has shown that a “recurring source of systematic variation” (You, Dörnyei, & Csizér, 2016, p. 100) is that females exhibit more positive attitudes toward language learning. In addition, this robust difference tends to disappear among English majors (You & Dörnyei, 2016; You et al., 2016). These findings are mirrored by research on mathematics. Mathematics shows the opposite gender pattern, in that males tend to show more positive attitudes toward it. For example, a meta-analysis by Hyde, Fennema, Ryan, Frost, and Hopp (1990) shows that males tend to stereotype mathematics as more masculine. However, their meta-analysis also shows that this pattern is disappearing (p. 310). The emerging picture, therefore, is that females are increasingly rejecting the gender stereotype that language and mathematics being female and male subjects, respectively.

This diminishing difference between the two genders, however, stands in stark contrast to the observation that fewer females are majoring in scientific disciplines.

According to latest report of the National Science Foundation (2015), the majors with the lowest female proportions are engineering, computer sciences, and physics. In addition, women with PhDs constitute only one-third in economics and around only one-fourth in mathematics and statistics. Therefore, explicit attitudes are showing a diminishing trend in gender differences, but reality shows that the gap still persists.

One explanation for this paradoxical pattern is that we should take into account implicit attitudes as well. Because of the flexibility of modern measures of implicit attitudes, researchers can examine gender differences from various perspectives (e.g., see Table 5.2). Indeed, research has shown that females tend to show more implicit positivity toward language and arts (vs. math and science) than do males (Nosek, Banaji, & Greenwald, 2002). This effect has also been observed in schoolchildren as young as 6 years of age (Cvencek, Meltzoff, & Greenwald, 2011). These results suggest that explicit attitudes may reveal only part of the overall picture in gender differences. It would not be as easy to adapt traditional measures to investigate the various perspectives listed in Table 5.2.

Table 5.2: Different concepts that can be investigated with modern measures. Adapted from Nosek et al. (2002).

Concept	Description
Language attitude	Preference for language
Language–gender stereotype	Belief that language is a female subject
Language identity	Identification of oneself with language
Gender identity	Identification of oneself with male or female

Another example of the flexibility of modern measures appears in the investigation of intergroup relations. The language motivation field has a long history of investigating the relationship between attitudes toward an L2 group and success in learning the language of that L2 group (Gardner, 1985, 2010). Traditional measures such as the MGT can offer some general information (primarily related to *status* and *solidarity*) that relies on the participant’s self-report. In contrast, modern measures can be designed to test specific attitudes and stereotypes without resorting to direct self-report.

One advantage of this flexibility is that researchers can adapt these measures to examine sensitive topics, such as in-group identification and favoritism more directly. In the

American context, for example, Greenwald and Pettigrew (2014) maintain that “ingroup favoritism is plausibly more significant as a basis for discrimination... than is outgroup-directed hostility” (p. 669). Indeed, a meta-analysis by Balliet, Wu, and De Dreu (2014) shows that, in the context of cooperation, intergroup discrimination is the result of in-group favoritism rather than out-group derogation. When it comes to language learning, it is also plausible that such in-group favoritism, including ethnocentrism and fear of assimilation, are important inhibitors of language learning.

Another aspect of in-group favoritism is religiosity. Our field has only recently started to consider the role of religiosity and language learning (e.g., Wong, Kristjansson, & Dörnyei, 2013). To be sure, in societies where religion is a salient issue, as it is the case for Muslims, it is plausible that level of religiosity might be related to success in language learning. In Europe, for example, religiosity is commonly viewed as a hindrance to openness to other groups (e.g., Foner & Alba, 2008). Diehl and Koenig (2013) report that immigrants from different backgrounds experience a decrease in religious practices upon arriving to Germany. Muslim immigrants, however, subsequently resume their various religious activities, a process the researchers describe as ‘religious reorganization’. This process is relatively independent from social and structural assimilation. Another study by Kalmijn and van Tubergen (2006) in the Netherlands sheds more light on this process. In their study on ethnic intermarriage, Kalmijn and van Tubergen found that immigrants from Turkish and Moroccan backgrounds tend to be more closed than those from Caribbean backgrounds. For Muslims, marriage decisions are strongly influenced by the religious affiliations of potential partners. This shows that level of religiosity can have social consequences, affecting integration into the L2 group and proficiency in language learning. Modern measures are more suited to investigation of the implicit dimension of these processes than are traditional measures.

Finally, modern measures can easily allow researchers to investigate the interaction between explicit and implicit attitudes. As argued in Chapter 2, individuals are not helpless in the face of unconscious sources of motivation, and can actively and agentically counteract them (e.g., Devine, Plant, Amodio, Harmon-Jones, & Vance, 2002; Glaser & Knowles, 2008). For example, Devine et al. (2002) have shown that when participants had implicit biases against an out-group but also had internalized motivations to control these biases, they were able to control their prejudice better than participants with similar biases but without the motivation. Similarly, Glaser and Knowles (2008) found that there is an interaction between an implicit attitude toward prejudice and an implicit belief that oneself is prejudiced. More

specifically, those who exhibited a weak association between prejudice and bad, and at the same time a strong association between oneself and prejudice, turned out to be the most biased group of the participants.

5.4 Conclusion

This chapter has offered an overview on several measures of implicit attitudes and motivation. Two measures were described as traditional (the Match-Guise Technique and the Picture Story Exercise), and the other two as modern (the Implicit Association Test and the Single-Target Implicit Association Test). There are many more measures. Nosek et al. (2011), for example, list 20 different implicit measures. The discussion in this chapter was limited to a sample of four measures in order, first, to offer a comparison between modern with traditional measures and, second, to show the flexibility of modern measures. In addition to this, the next chapter presents two empirical studies, each using one of the two modern measures reviewed in this chapter.

Chapter 6: The Present Research

Put your money where your mouth is

—English saying

6.1 Introduction

The previous chapters have involved only speculations about the relevance of unconscious motivation to language learning, rather than any direct empirical evidence. It is yet to be known whether the various paradigms and theoretical frameworks reviewed (especially in Chapter 4) would make any meaningful contribution to our field. This chapter puts some of these ideas to the test.

It is possible for the language motivation field to gain insights from the wide-ranging literature on unconscious motivation and attitudes reviewed in this thesis. For example, one of the most central concepts in L2 motivation theory is the notion that positive attitudes toward L2 speakers play an important facilitative role in L2 learning success. First introduced by Gardner and Lambert (1959), the claim that learning an L2 is unlike other school subjects—because of the social baggage it entails—has enjoyed continuing popularity throughout the decades. In more recent developments, L2 motivation has been construed cognitively in terms of future self-guides (e.g., Dörnyei, 2009b; Dörnyei & Kubanyiova, 2014). Nonetheless, because there is “no doubt that L2 speakers are the closest parallels to the idealised L2-speaking self” (Dörnyei, 2009b, p. 27), the new self interpretation is “fully compatible” (p. 28) with the traditional emphasis on attitudes toward L2 speakers. In fact, “it is difficult to imagine that we can have a vivid and attractive ideal L2 self if the L2 is spoken by a community that we despise” (p. 28).

However, research on learners’ attitudes and motivation in our field has generally focused on explicit attitudes, as evident from the predominance of self-report questionnaires and interviews (Ushioda, 2013). It is plausible that another, implicit dimension also plays a role in language motivation. The present research therefore investigated this possibility by adopting implicit attitudes as a broad theoretical framework, and by drawing from some aspects from the implicit motives tradition. Two studies were conducted to answer a series of research questions. These two studies and their results are detailed in this chapter. The procedures followed in this research were endorsed by the ethics committee at the University of Nottingham.

6.1.1 Analysis of the context of this research

Most of the participants of Study 1, and virtually all participants in Study 2, come from Saudi Arabia. This section therefore discusses the potential relevance of implicit attitudes to this context. The Saudi context is definitely a curious one: While few Saudi people would (explicitly) endorse terrorism, at the same time this very context has been a major breeding ground for Al-Qaeda and Islamic State, the latter considered the most resourced terrorist group in the history of terrorism (Lock, 2014). For this reason, it is likely that this context is fertile for the development of negative implicit attitudes toward Westerners and possibly toward learning English itself. This section therefore tries to shed light on this context in an attempt to understand what might make it unique in this respect.

One reason why negative implicit attitudes might develop in this context has to do with prevalence of intolerant discourse. Anti-Western discourse is rampant, systematic, and institutionalized in this context. Many mosques spread hate speech, especially during Friday sermons, which are broadcast via loudspeakers so that you can hear them from anywhere in the neighborhood. Even children watching television at home can listen them. This recently prompted the Saudi Shoura Council (a parliament-like entity) to call on the government to regulate and monitor these sermons (Arab News, 2016). School textbooks are also rife with intolerance, prescribing hatred of non-Muslims as a *duty* of every devout Muslim. Several heads of major publishing houses have therefore written an article arguing that “the Saudi education system continues to indoctrinate children with hatred and incitement” (Bernstein et al., 2012). The authors give some examples:

A ninth-grade textbook published by the Ministry of Education states, “The Jews and the Christians are enemies of the believers, and they cannot approve of Muslims.” An eighth-grade textbook says, “The Apes are the people of the Sabbath, the Jews; and the Swine are the infidels of the communion of Jesus, the Christians.” These are just two examples of a long list of hate-filled passages.

A more detailed report was published by the Center for Religious Freedom (2006), which cites examples from various grades levels. A lesson from a ninth-grade textbook teaches students about ‘the condemnable characteristics in Jews’. The answer, which the students might be tested on in exams, includes ‘practicing sorcery’ and ‘obeying the Devil’. The Saudi government is trying hard to tackle this problem but they face resistance from conservatives. Religious conservatism is not specific to Saudi Arabia (a similar issue has

been reported in Israeli textbooks, Peled-Elhanan, 2012). The Israeli–Palestinian conflict has augmented the problem, as the society generally perceives the West as unjustly siding with Israel. News of an attack on Israeli soil therefore becomes a cause for rejoicing, even if the casualties include civilians. A large section of the society also subscribes to American–Israeli conspiracy theories, according to which the West is actively trying to prevent Muslims from becoming one powerful nation and are responsible for the many plights of Muslims throughout modern history. Children are taught to glorify the early Muslim conquests and to anticipate the ‘Islamic dream’ of reconquering the regions that early Muslims had conquered and then spreading Islam globally through jihad someday. This is prophesized to successfully happen after Al-Mahdi’s and Jesus’s Coming to fight the one-eyed Al-Masih ad-Dajjal (the Antichrist in Islamic tradition) alongside Christians, Jews, and pretty much everybody on earth who will dare to oppose the future Islamic empire. These views routinely appear in the media and in documentary-like television programs.

Considering all this, it should no longer be surprising that this ideology produced 15 of the 19 hijackers in the September 11 terrorist attacks on the United States. Nor should it be surprising that Saudi militants currently constitute the second largest proportion (after Tunisia, The Soufan Group, 2015) of foreign fighters for Islamic State terrorist group, itself partly motivated by the prophesy of Islamic domination after the Coming. According to some reports (Dearden, 2015), Saudi fighters reportedly dominate Islamic State’s suicide-bomber waiting lists, and regularly jump the line through ‘nepotism’, making suicide-hopefuls from other nationalities complain about ‘corruption’ within Islamic State! Inside Saudi Arabia, Islamic State sympathizers (as well as from other Gulf states) have donated generously to it, which prompted the Saudi government to blanket-ban unauthorized donations to any part of Syria (di Giovanni, Goodman, & Sharkov, 2014). Another section of the society is in denial, again blaming an American–Israeli or Iranian conspiracy for the creation of Islamic State, citing as ‘evidence’ the fact that Islamic State has killed many Muslims but hardly any Jews.

After all, English is sometimes referred to there as ‘the language of the infidels’. This raises the question of why a devout Muslim would want to learn the language of their infidel enemies. In order to justify that, official textbooks state that one objective of the English curriculum is to enable students to “present and explain the Islamic concepts and issues and participate in spreading Islam” (cited by Alrabai, 2010, p. 8). In a similar vein, some English teachers justify to their students that “the one who learns the language of a people will safeguard against their cunning.” This is certainly not the type of integrative motivation to

learn a language that the field has examined (cf. Gardner, 1985). Nor is this the ideal vision of a native speaker a learner holding these views would like to approximate (Dörnyei, 2009a).

Considering these characteristics, it is possible that implicit attitudes toward native speakers of English might play a role in the motivation to learn English in the Saudi context (and other contexts in that part of the world). This chapter presents two Studies attempting to find out whether implicit attitudes are relevant to language learning in these contexts.

6.2 Study 1⁵

Study 1 aimed to answer three research questions. These are discussed next.

Openness to the L2 group. Since L2 motivation is associated with openness to the L2 group (Dörnyei, 2009b), this Study investigated whether learners with positive implicit attitudes would exhibit more openness. Openness might be indicated directly by more favorable attitudes toward the L2 group, or indirectly by lower L1 group affiliation such as ethnocentrism and fear of assimilation (see Freynet & Clément, 2015). As reviewed in Chapter 5, another indication of L1 group affiliation is religiosity—especially in Europe, where religiosity is commonly viewed as a hindrance to openness to other groups (e.g., Foner & Alba, 2008). Since the participants of this Study are L1 Arabic learners of English in the UK (see Participants below), and since Islam is inseparable from one’s L1 identity for many Arabs, this Study also investigated the association between religiosity and implicit attitudes toward the L2 group. In addition to this, Chapter 5 reviewed evidence that the role of implicit attitudes might be gender-specific. This Study therefore examined whether the results are different for males and females.

Furthermore, rather than simply comparing learners with positive versus negative attitudes, this Study examined the *congruence* between explicit and implicit attitudes. Drawing from the literature on explicit–implicit congruence, attitudes might be thought of as varying along two dimensions. An individual’s attitude toward a certain social object might be congruently favorable (or unfavorable) at the explicit and implicit levels, or it may be incongruently favorable on one dimension but not the other (see Table 6.1).

Table 6.1: The four types resulting from the two-dimensional conceptualization of attitudes.

Type	Attitudes		Comment
	Explicit	Implicit	
1	Positive	Positive	Most favorable scenario
2	Negative	Negative	Least favorable scenario
3	Negative	Positive	Norm of mediocrity?
4	Positive	Negative	Resilient motivation?

Note. Although attitude falls along continua, this categorical classification (positive vs. negative) is intended for illustrative purposes.

⁵ Part of this Study has appeared in Al-Hoorie (2016a).

Type 1 in Table 6.1 is the ideal scenario, while Type 2 is the least preferable one. Type 3 would be unusual, and might be a reflection of the norm of mediocrity (see Dörnyei & Ushioda, 2011; Taylor, 2013). The norm of mediocrity refers to the situation where some learners deliberately show mediocre motivation and achievement in order to avoid being penalized by their peers. Type 4 can arguably be seen as the most interesting scenario for the present purposes because it parallels Type 1 in terms of explicit attitudes. Individuals in both types express positive attitudes explicitly, but they differ in their implicit attitudes. Comparison of these two types could shed important light on the role of implicit attitudes. For this reason, this research question focused on Types 1 and 4 by first selecting learners who expressed positive attitudes at the explicit level, and then dividing them into those with congruently positive and incongruently negative attitudes at the implicit level.

Finally, because this type of classification might seem artificial, a cluster analysis was also conducted to validate the results from this classification. As detailed below, the results of the two approaches led to very similar results. This research question could be summarized as follows:

RQ 1: Compared with incongruent learners, do congruent Arab learners of English in the UK exhibit more openness to the L2 group?

Note that the ‘L2 group’ is used generically here. Although it is true that L2 speakers are not a monolithic group, the intention is the learner’s subjective evaluation. As an illustration, one learner might form an attitude toward a certain group through extensive interactions with them, while another might form another attitude based on, say, simply a story s/he heard. In both cases, the attitude becomes a *subjective reality* for the individual that can potentially affect his/her perception, behavior, and desire to communicate with members of the group in question, regardless whether it is actually true. This demonstrates the importance of such subjective beliefs. They can have an effect even if they are false.

Personality coherence. Based on the personality coherence literature, explicit–implicit conflict is uncomfortable and therefore individuals with incongruent attitudes (i.e., Types 3 & 4) may tend to adopt explicit attitudes that are aligned with their implicit attitudes. This is certainly good news for individuals whose implicit attitudes are positive. However, as reviewed in Chapter 5, when implicit attitudes are negative (e.g., against another group), research shows that these negative implicit attitudes can be counteracted by factors such as high explicit motivation (e.g., Devine et al., 2002).

When it comes to language learning, it is therefore plausible that the effect of negative implicit attitudes toward L2 speakers may not be the same across the board: While some learners might submit to these attitudes (by adopting explicit attitudes that are also negative), others may have sufficiently high motivation to actively counteract them (and adopt positive explicit attitudes instead). The latter can happen when, for example, the learner recognizes the value of the language in degree attainment or in career advancement. From this perspective, then, learners with negative implicit attitudes range from those adopting their negative attitudes explicitly (for the sake of psychological comfort) to those counteracting them (for the sake of the pragmatic value of the language). In contrast, those with already positive attitudes implicitly would have little reason to adopt negative attitudes explicitly.

Thus, the personality coherence literature suggests that individuals with positive versus negative implicit attitudes may be two distinct groups. If this is the case, then treating them as a single group can be misleading. In the context of correlational analysis, for example, pooling heterogeneous groups and then calculating correlation coefficients has been described by some statisticians as nonsensical (Hassler & Thadewald, 2003). Because correlational analysis is by far one of the most common statistical procedures in language research (Plonsky, 2013), it would be interesting to find out whether taking implicit attitudes into account changes the resulting correlations. This Study therefore compared the correlations among attitudinal and motivational variables within each of these two groups. This research question can be formulated as follows:

RQ 2: Do Arab learners with positive versus negative implicit attitudes exhibit equivalent relationships among attitudinal and motivational orientations?

The moderating effect of implicit attitudes. Although finding novel results is interesting in itself, it is also important to consider how they relate to existing theory. As reviewed in Chapter 3, one particularly popular theory of L2 motivation at present is the L2 Motivational Self System (L2 MSS, Dörnyei, 2005, 2009b). In this model, attitudes toward L2 speakers predict the strength of the individual's ideal L2 self, which in turn predicts both the criterion measures and attitudes toward learning the language (see Figure 6.1). The current Study focuses on Arrows A and B in Figure 6.1 (Arrow C is relatively weak, e.g. Taguchi, Magid, & Papi, 2009; You et al., 2016; for a discussion, see Islam, Lamb, & Chambers, 2013, p. 239). The analysis explored whether implicit attitudes would moderate either of these two paths. Because this was the first attempt to integrate implicit attitudes with

the L2 MSS, no prior expectations were made about the direction of the effects. The relevant question can be stated as follows:

RQ 3: Do Arab learner's implicit attitudes toward L2 speakers moderate the relationship between explicit attitudes toward L2 speakers and the ideal L2 self, and between the ideal L2 self and attitudes toward learning English?

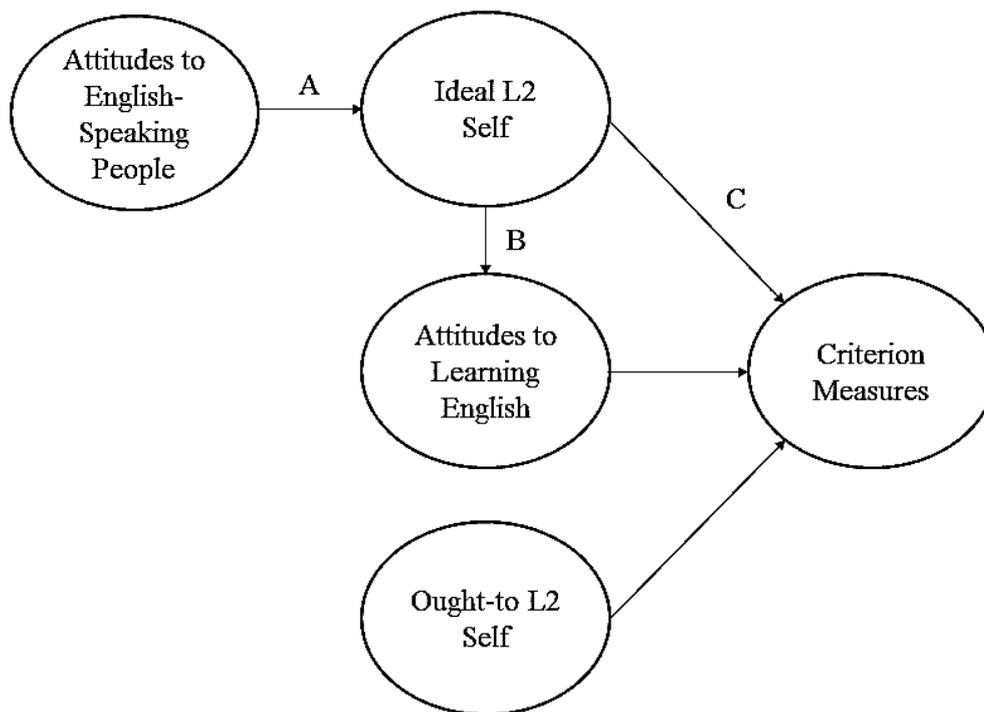


Figure 6.1: Schematic representation of the L2 Motivational Self System. Adapted from Taguchi et al. (2009) with permission.

Moderation was tested here using multi-group structural equation modeling (SEM) without modeling the moderator explicitly. Modeling the moderator explicitly in SEM is one approach for moderation analysis, called the MIMIC model. In discussing this approach, however, T. A. Brown (2015) describes it as “less common” (p. 241) and as usually appropriate for continuous variables (unlike the case here). After discussing different approaches to moderation, Hayes (2013) similarly argues that “Multiple-group structural equation modeling provides a more formal test of moderation of various paths in the model” (p. 409).

Finally, this Study involved the construction of a new scale related to religious attitudes. Because little is known about the relationship between religiosity and language learning, exploratory analyses were conducted on the religious attitudes scale in order to examine its relationship with the other variables in more detail.

6.2.1 Method

Participants

A total of 365 Arabic L1 speakers qualified for the final analysis. Data were collected from 11 more participants who were excluded either for random responding or for not being a native speaker of Arabic (see Data analysis below for more details). The qualifying participants (male = 257, female = 108) were studying English at various British universities and language institutes when they volunteered to take part in this Study. They came from various Arab countries, including Saudi Arabia (33.2%), Libya (29.3%), and Iraq (22.5%), and had lived in an English-speaking country for a minimum of half a month and a maximum of 96 months ($M = 22.43$, $SD = 20.3$). Different age groups were also represented in the sample (11% 17–20 years old, 25.5% 20–25, 23.3% 26–30, 16.4% 31–35, 14.8% 36–40, 7.9% older), with four participants having missing age data. As detailed below, length of residence and age were statistically controlled for (and this had no effect on the results).

Materials

Implicit test: The Implicit Association Test (IAT, Greenwald et al., 1998) was adapted to measure attitudes toward English speakers. As shown in Table 6.2, in each of the seven parts (called blocks), a left or right button on the keyboard was to be pressed in order to rapidly categorize a series of stimuli appearing in the center of a computer screen. In the first two blocks, the participants practiced categorizing words as to whether they were *Pleasant* or *Unpleasant* (conventionally called ‘attributes’), and then whether they were related to *Arabic* or *English* (‘categories’). Then the actual test started. In the first condition, Blocks 3 and 4, *Arabic* was paired with *Pleasant* while *English* with *Unpleasant* (see Figure 6.2). In the other condition, Blocks 6 and 7, the categories were switched so that *English* was now paired with *Pleasant*, and *Arabic* with *Unpleasant*. The participants also practiced the reversed attributes alone in Block 5. Before each block, the participants read instructions and were reminded to perform as fast as possible. The whole implicit test took around five minutes to complete. (See Appendix A for the stimuli used.) Note that the implicit test is concerned with Arabic and English *speakers*, not the languages per se.

Table 6.2: Overview of the Implicit Association Test.

Block	Trials	Function	Response key assignment	
			Left button (E)	Right button (I)
1	20	Practice	Pleasant	Unpleasant
2	20	Practice	Arabic	English
3	20	Test 1	Pleasant or Arabic	Unpleasant or English
4	40	Test 2	Pleasant or Arabic	Unpleasant or English
5	20	Practice	Unpleasant	Pleasant
6	20	Test 1	Unpleasant or Arabic	Pleasant or English
7	40	Test 2	Unpleasant or Arabic	Pleasant or English

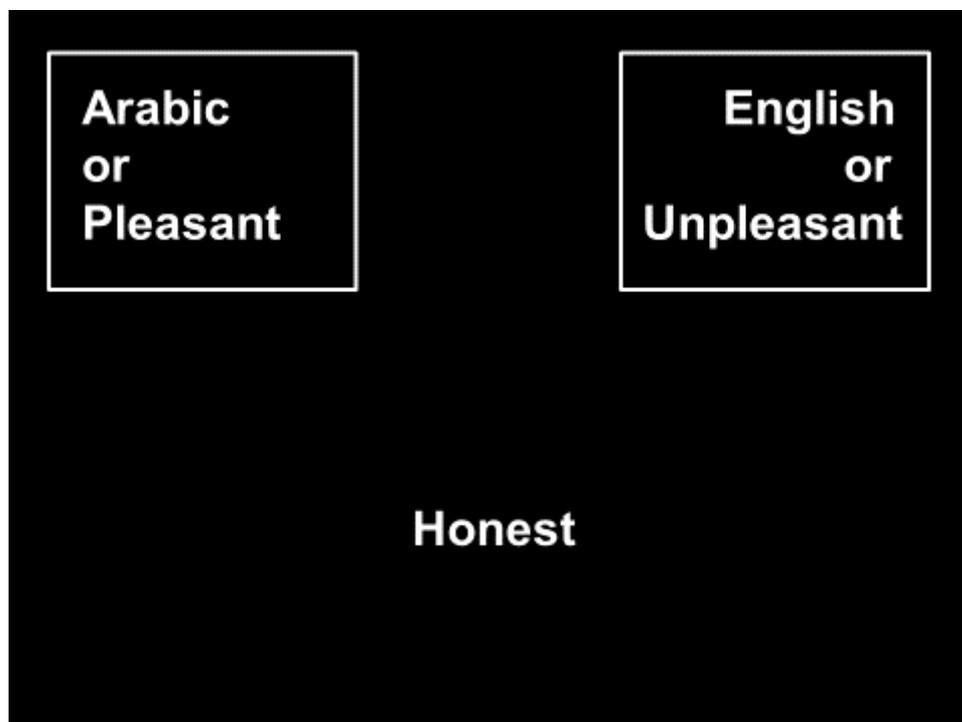


Figure 6.2: A trial of the IAT. The correct answer here would be the left button (E) because the stimulus *Honest* belongs to *Pleasant*. In the actual test, *Pleasant*, *Unpleasant*, and their stimuli appeared in green font, while *Arabic*, *English*, and their stimuli appeared in white.

The order of the combined tasks was not counterbalanced because counterbalancing can artificially suppress explicit–implicit correlations (Banse, Seise, & Zerbes, 2001; Gawronski, 2002) and sometimes artificially inflates them (Hofmann et al., 2005). When an incorrect response was given, a red X appeared and the participant had to correct the error, by pressing the other button, before proceeding to the next trial. The stimuli in the test blocks were alternatively drawn from the *Arabic* and *English* categories (odd-numbered trials) and

from the *Pleasant* and *Unpleasant* attributes (even-numbered trials). Each stimulus was selected randomly and without replacement, and therefore all stimuli were used once before any were reused. As explained in more detail in Chapter 5, the IAT is not a measure of attitudes per se. The IAT does not ask the participant about his/her opinion about whether, say, *Honest* should be pleasant or unpleasant. Instead, all stimuli are shown to the participant in advance with their correct categorization, and so the participant's task is not to guess (or express their attitude about) the correct response, but to simply perform the task as fast as possible. Implicit attitudes are then deduced from the response speed in the test. If one participant is able to associate *Pleasant* with *Arabic* more easily than with *English*, we conclude that this participant has an implicit preference for Arabic over English. This result may or may not be congruent with the participant's expectations or his/her responses on a questionnaire.

This test was first trialed informally to make sure that the stimuli represent their respective categories and attributes unambiguously. In the main study, split-half analysis based on even-versus-odd trials showed that the IAT had very good reliability (Spearman–Brown's $\rho = .83$). The IAT scores were coded so that a positive score reflected implicit preference for the L2 group, and a negative score reflected implicit preference for the L1 group. The IAT is a relative measure, in that a positive score indicates preference for the L2 group but does not necessarily imply negative attitudes toward the L1 group (i.e., only more positive attitudes toward the L2 group). For this reason, instead of using the conventional terminology that describes learners as having positive versus negative attitudes toward the L2 group, they are labelled here simply as having implicit preference for the L2 group versus the L1 group, respectively. All participants were taking the IAT for the first time. The software used was Inquisit 4 (2014).

Explicit measures: The participants also completed nine self-reported attitudinal and motivational scales that seemed particularly relevant when drawing comparisons between explicit and implicit dispositions (reliability details are discussed in the Results section):

- 1) *Attitudes toward English-Speaking People* (3 items). Example: I wish I could have many more English friends.
- 2) *Attitudes toward Learning English* (4 items). Example: Learning English is very interesting.
- 3) *The Ideal L2 Self* (4 items). Example: I can imagine myself mastering English one day.

- 4) *The Ought-to L2 Self* (3 items). Example: I must study English because it will earn me respect in the society.

A higher score in each of these four scales, adapted from Taguchi et al. (2009), indicated more positive attitudes. Three other scales measured the strength of affiliation to one's own group and the desire to preserve and spread its values:

- 5) *Fear of Assimilation* (5 items), adapted from S. Ryan (2009). Example: I think that the interest in the West has a negative influence on the Arab culture.
- 6) *Ethnocentrism* (5 items), adapted from Neuliep and McCroskey (1997). Example: I find it difficult to work together with people who have different customs.
- 7) *Religious Attitudes* (4 items), developed for this Study. Example: The idea of sharing my Islamic faith with my non-Muslim friends is always present in my mind.

A higher score in each of these three scales reflected stronger L1 group affiliation. The above seven scales all involved a seven-point Likert response format ranging from *Strongly Agree* to *Strongly Disagree*. Finally, the instrument also included two semantic differential scales developed for this Study:

- 8) *Attitudes toward the English* (10 bipolar adjective scales).
- 9) *Attitudes toward Arabs* (10 bipolar adjective scales).

The ten adjectives used in these two scales were identical to each other, and to the stimuli used for the *Pleasant* and *Unpleasant* attributes of the IAT (though 'clean' and 'dirty' were dropped from the semantic differential scales). Semantic differential scales were used here instead of Likert scales due to the observation that a higher explicit–implicit consistency is found when implicit scores are compared with scores from semantic differential scales (Hofmann et al., 2005). Because the participants were residing in the UK, both explicit and implicit measures addressed British speakers of English specifically. All materials in the explicit and implicit measures were also translated into Arabic to avoid language interference. The complete list of questionnaire items is available in Appendix B.

Procedure

During a one-to-one meeting with the researcher, each participant responded to items randomly drawn in a fixed order from the seven Likert scales, to the Arab semantic differential scale, to the English semantic differential scale, to the implicit test, to demographic questions, and to the Religious Attitudes scale, in this sequence—all on a

computer. The explicit and implicit parts were not counterbalanced because previous research has documented little order effect (see Lane et al., 2007).

Data analysis

Eight participants were excluded from the analysis for having more than 10% latencies faster than 300 ms in the implicit test, which is indicative of random responding. Three more participants were excluded because their L1 was Kurdish not Arabic, though they passed as native speakers of Arabic. The sample was restricted to Arabs because the scales related to L1 group affiliation were worded to specifically address Arab identity and Arabic as L1.

For the implicit test, the analysis closely followed the improved scoring algorithm, called the *D* Measure, recommended by Greenwald, Nosek, et al. (2003). The four test blocks were included in the analysis, and the latency of each incorrect response was replaced with the block mean plus 600 ms error penalty. The analysis differed from the recommended algorithm in two ways, however. First, the 10,000 ms latency threshold used to determine and exclude extreme responses, which was selected “somewhat arbitrarily” (Greenwald, Nosek, et al., 2003, p. 201), was replaced with the more stringent threshold of 5,000 ms. Despite the stringency of this new procedure, virtually all participants had less than 10% latencies that were slower than 5,000 ms, and so no participant had to be excluded because of it. Second, the standard IAT score ranges from -2 to $+2$ (Nosek & Sriram, 2007), with conventional break points of $> .15$, $> .35$, and $> .65$, which signify slight, moderate, and strong implicit preference, respectively. The IAT scores were multiplied by 1.5 here so that the new scale ranged from -3 to $+3$. The break points therefore became $.20$, $.50$, and 1.0 after rounding. In addition to its intuitive appeal, this rescaling made the IAT scores directly comparable to scores derived from the explicit measures.

For the explicit measures, all items were centered on zero, so that they also ranged from -3 to $+3$. Following Greenwald, Nosek, et al. (2003), a relative explicit measure was obtained from the two semantic differential scales using a formula adapted from the *D* Measure in order to facilitate comparison with the implicit scores:

$$\frac{En - Ar}{SD_{pooled}} \times 1.5 \quad (6.1)$$

where *En* is Attitudes toward the English, *Ar* is Attitudes toward Arabs, and SD_{pooled} is their combined standard deviation. The resulting score, called the Explicit *D* Measure here, ranged

from almost -3 to $+3$ (from -2.92 to $+2.92$ to be exact) and correlated very strongly with the mean of these two semantic differential scales ($r = .96, p < .001$).

In addition to this, an analysis of the measurement model was conducted. The measurement model aims to examine the reliability and validity of the scales. In order to achieve this, procedures from both classical test theory and item response theory were used. Cronbach's (1951) alpha from classical test theory, despite its psychometric limitations (see Sijtsma, 2009) was used because it is extremely common in the field, and so it was presented here in order to facilitate comparison with other studies in the literature. From item response theory, Mokken (1971) scale analysis was implemented, which is the nonparametric counterpart of Rasch (1980) scaling.

To make the difference between the alpha and Mokken clearer, consider their formulas. For Cronbach's alpha, the following formula is used:

$$\alpha = \frac{k}{k-1} \left(\frac{SD_x^2 - \sum_{i=1}^k SD_i^2}{SD_x^2} \right) \quad (6.2)$$

where k is the number of scale items. Equation (6.2) indicates that alpha is a function of the variance of the total score of each person (SD_x^2) minus the sum of the variance of the responses to each item (SD_i^2). In other words, the higher the variance of the respondents relative to the variance of individual items, the higher the alpha. On the other hand, high item variance is considered noise that obscures the true score. This is why alpha has been described as a measure of the internal consistency of the items, though Sijtsma (2009) points out that internal consistency is an ambiguous construct and has no clear definition. Additionally, because Equation (6.2) is multiplied by a term involving the number of items (k), another property of alpha is that it can be an artifact of the number of items in the scale. The longer the scale, the higher the resulting alpha, even if some items are actually unrelated to the underlying construct. In this Study, Cronbach's alpha was computed for each scale using SPSS 22 (IBM Corp, 2013).

On the other hand, Mokken scaling utilizes Loevinger's coefficient of homogeneity (H). H is a criterion of scalability:

$$H = 1 - \frac{\text{Observed Errors}}{\text{Expected Errors}} \quad (6.3)$$

where *errors* refers to Guttman errors. Guttman scale assumes that the items are of increasing difficulty (e.g., become harder to endorse in the case of questionnaire items). Then, the model assumes that each respondent who endorses an item should have also endorsed all ‘easier’ items. For example, if a scale has five items of increasing difficulty, endorsing the hardest item implies that the individual has also endorsed all other easier items. Deviations from this pattern (i.e., *observed errors* in the Equation [6.3]) are then divided by errors expected under statistical independence (van Schuur, 2011), which is analogous to a chi-square procedure. Therefore, the patterns of persons and of items can be analyzed independently, i.e. whether the items can be scaled in terms of difficulty and whether the respondents can be scaled in terms of ability. Thus, the focus of Mokken becomes the scalability of items and persons rather than deviation from a true score as in the case of Cronbach’s alpha. Consequently, Mokken scaling involves two models: the *monotony homogeneity* (which scales persons), and *double monotonicity* (which additionally scales items). In the case of questionnaire data, the monotone homogeneity is typically sufficient.

Despite the apparent simplicity of Equation (6.3), simulation research has shown that Mokken scale analysis performs very well in detecting the underlying structure of the data. For example, Karabatsos (2004) reports that H “consistently had the best detection rates over the 60 data sets” (p. 637). In another simulation study involving 2400 datasets, van der Eijk and Rose (2015) report that “the risk of incorrectly diagnosing any of the items as not belonging to the same latent dimension as the other items is 0.7%” (p. 25). Meijer and Baneke (2004) similarly recommend applying Mokken scaling, even if the purpose is to use the more restrictive Rasch model subsequently, in order to avoid misleading results. Therefore, the major advantage of Mokken scaling is to ensure the unidimensionality of the construct, in that the items of each construct belong to it and not to other constructs, something that Cronbach’s alpha is not designed to do. Factor analysis can also achieve this, but it typically requires continuous data, and with ordinal data there is a risk of spurious overdimensionality especially with maximum likelihood estimation (van der Eijk & Rose, 2015). Other estimation procedures are available in some specialized software, such as robust maximum likelihood and diagonally weighted least squares, but their merits are still debated (for a recent analysis, see Li, 2016). In this Study, the scales were submitted to Mokken scale analysis using MSP5 (Molenaar & Sijtsma, 2000).

6.2.2 Results

The measurement model

The aim of the measurement model is to investigate the psychometric properties of the scales in this Study before proceeding to the statistical analysis. The results of the measurement model are in Table 6.3. This table presents the number of items in each scale along with its Cronbach's alpha, *rho* (another reliability measure similar to Cronbach's alpha based on Mokken scaling), and homogeneity (*H*). Conventionally, *H* is interpreted using the break points of $\geq .30$, $\geq .40$, and $\geq .50$ to refer to weak, medium, and strong homogeneity, respectively (Mokken, 1971, p. 185). All scales exhibited acceptable levels of reliability and homogeneity. One exception is a homogeneity just below the recommended threshold for Attitudes toward the English. This is a rather interesting finding because this pattern did not emerge for Attitudes toward Arabs, even though the adjectives used for the two scales were identical. This implies that attitudes toward the L2 group may be differently structured than attitudes toward the L1 group. Inspection of Q–Q plots showed that the variables are reasonably normally distributed.

Table 6.3: Reliability and homogeneity of scales.

Scale	No. of items	α	<i>rho</i>	<i>H</i>
Attitudes to English-Speaking People	3	.85	.86	.68
Attitudes to Learning English	4	.74	.73	.43
Ideal L2 Self	4	.78	.79	.52
Ought-to L2 Self	3	.65	.65	.41
Fear of Assimilation	5	.78	.77	.43
Ethnocentrism	5	.74	.69	.33
Religious Attitudes	6	.75	.77	.38
Attitudes to the English—SDS	10	.74	.74	.24
Attitudes to Arabs—SDS	10	.84	.84	.37

Note. *H* = scale homogeneity.

Because RQ 3 involves a SEM analysis, a measurement model was also conducted on the latent variables used in that part of the analysis. The results of that measurement model are discussed under RQ 3, along with the SEM results.

Descriptive statistics

Because the majority of the sample come from three countries (Saudi Arabia, Libya, and Iraq), a chi-square test was first performed in order to find out whether the distribution of individuals with high and low implicit attitudes was statistically equivalent across these

countries. Based on a median-split of the implicit test score, there was no evidence of unequal distribution either for males, $\chi^2(2) = 4.892, p = .09$; or for females, $\chi^2(2) = 0.251, p = .88$. These results, therefore, suggests that the distribution of implicit attitudes is independent of the three main countries in the sample. The observed and expected counts per cell are shown in Table 6.4. Note that this analysis was based on participants from the three major nationalities only, and not the whole sample. This is why the total number of participants in Table 6.4 is slightly smaller than that reported in the Participants section above.

Table: 6.4: Chi-square results for the distribution of the sample showing observed and expected counts based on gender and nationality.

		Saudi	Iraqi	Libyan	Total
Male	Low Implicit	33 (30.5)	25 (32.5)	54 (49)	112
	High Implicit	28 (30.5)	40 (32.5)	44 (49)	112
	Total	61	65	98	224
Female	Low Implicit	32 (31.4)	9 (8.9)	4 (4.7)	45
	High Implicit	28 (28.6)	8 (8.1)	5 (4.3)	41
	Total	60	17	9	86

Note. This analysis was based on participants from the three major nationalities, and not the whole sample. Values in parentheses are the expected values.

Table 6.5 presents the descriptive statistics of the variables and their inter-correlations. The Explicit *D* Measure had a neutral mean but a relatively higher standard deviation—indicating wide disagreement among the participants—while the Implicit *D* Measure suggests that the overall sample was actually moderately inclined more toward their L1 group. The newly developed Religious Attitudes scale correlated moderately to strongly with Ethnocentrism and Fear of Assimilation, suggesting that it also reflects an aspect of L1 group affiliation.

The table also shows that the participants expressed generally positive explicit attitudes toward English-speaking people and toward learning English and had high ideal L2 selves. This was to be expected given that the sample was made up of individuals who chose to go to the UK to study English. This positive slant would make the case more interesting if subsequent analyses reveal that some participants have an influential L1 implicit preference operating beneath this positive surface.

The correlations in Table 6.5 show that the Explicit and Implicit *D* Measures did not correlate with each other. However, they did behave similarly in correlating negatively with all three L1 group affiliation scales. There were no significant differences in how strongly

they correlated with these three scales (the strong correlations between the Explicit *D* Measure and the two semantic differential scales were merely an artifact of being derived from them). In line with previous research, females outperformed males both in the implicit test, $t(363) = 1.91, p = .057, d = 0.22$, and in the Ideal L2 Self, $t = 4.93, p < .001, d = 0.57$.

Table 6.5: Means, standard deviations, and zero-order correlations for the overall sample ($N = 365$). All scales are centered on zero and range from -3 to $+3$.

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10
1. Attitudes to English-Speaking People	1.59	1.05	—									
2. Attitudes to Language Learning	1.77	0.84	.41***	—								
3. Ideal L2 Self	1.95	0.77	.17**	.17***	—							
4. Ought-to L2 Self	0.77	1.27	.30***	.32***	.15**	—						
5. Fear of Assimilation	0.00	1.29	-.14**	-.06	-.07	.14**	—					
6. Ethnocentrism	-0.65	1.29	-.10†	.13*	-.03	.19***	.53***	—				
7. Religious Attitudes	1.17	1.40	-.02	.12*	.04	.01	.34***	.48***	—			
8. Attitudes to Arabs—SDS	0.73	0.90	.05	.04	.12*	.03	.11*	.27***	.29***	—		
9. Attitudes to the English—SDS	0.77	0.76	.36***	.20***	-.03	.19***	-.20***	-.11*	-.10†	.12*	—	
10. Explicit <i>D</i> Measure	0.01	1.11	.21***	.13*	-.10†	.09	-.22***	-.30***	-.27***	-.70***	.56***	—
11. Implicit <i>D</i> Measure	-0.78	0.61	.02	.00	-.01	-.03	-.24***	-.16**	-.18***	-.11*	.02	.07

Note. SDS = semantic differential scale. *** $p \leq .001$, ** $p \leq .01$, * $p \leq .05$, † $p < .10$.

RQ 1: Are congruent learners more open to the L2 group?

This question is concerned with whether participants with explicit–implicit congruence (i.e., Type 1 in Table 6.1) would exhibit more openness to the L2 group than would incongruent participants (Type 4 in Table 6.1). Because both of these types share positive attitudes toward L2 speakers at the explicit level, this part of the analysis included only participants who obtained a score higher than the neutral zero (i.e., positive) in Attitudes toward English-Speaking People. This is the first step. The two types differ in their implicit attitudes, and so participants selected in the first step were then subdivided based on their Implicit *D* Measure scores into those in the upper or lower quartiles (i.e., excluding middle-range participants). As a result, this two-step selection procedure produced two subgroups with contrasting implicit attitudes but commonly shared positive explicit attitudes.

A *t*-test demonstrated that the participants who exhibited explicit–implicit congruence also exhibited significantly more positivity in Attitudes toward English-Speaking People ($M = 2.05$, $SD = 0.75$, $n = 78$) than the ones with explicit–implicit incongruence ($M = 1.81$, $SD = 0.77$, $n = 84$), $t(160) = 1.99$, $p = .048$, $d = 0.32$. These results lend support to the view that explicit–implicit congruence predicts more openness to the L2 group. Table 6.6 contains a summary of the differences in the other group-related scales. All results are also consistent with this view.

Table 6.6: Differences between participants with explicit–implicit congruence ($n = 78$) and incongruence ($n = 84$).

Scale	Group	<i>M</i>	<i>SD</i>	<i>t</i>	<i>d</i>
Fear of Assimilation	Congruent	−0.42	1.27	3.35***	0.53
	Incongruent	0.28	1.36		
Ethnocentrism	Congruent	−0.96	1.27	2.49**	0.39
	Incongruent	−0.45	1.34		
Religious Attitudes	Congruent	0.82	1.44	3.11**	0.49
	Incongruent	1.47	1.22		
Attitudes toward Arabs	Congruent	0.50	0.89	2.48**	0.40
	Incongruent	0.85	0.86		

Note. Bonferroni correction implemented. Adding length of residence in an English-speaking country and age as covariates does not influence these results. ** $p \leq .01$, *** $p = .001$

As explained above, the approach used here to classify learners (see Table 6.1) might seem artificial. It is possible that different researchers may follow slightly different classification approaches. These results were therefore validated using cluster analysis. A two-step log-likelihood cluster analysis based on these five scales readily yielded two clusters with a ratio of 1.05. A *t*-test showed that the cluster showing more explicit openness to the L2 group also scored significantly higher in the implicit test, $t(363) = 3.60, p < .001, d = 0.38$. This suggests that implicit attitudes are associated with more openness to the L2 group for the sample overall. Further analyses showed that this effect is markedly stronger within the male subsample, $t(250) = 3.27, p = .001, d = 0.41$; but not statistically significant for the female subsample, $t(106) = 1.49, p = .14, d = 0.29$. These results suggest that implicit attitudes are especially relevant for male learners.

RQ 2: Are correlations equivalent for learners with L1 vs. L2 preference?

This question compared the correlation coefficients for learners with implicit preference for the L1 versus L2 groups. An analysis was conducted based on a median-split of the Implicit *D* Measure scores. Table 6.7 presents the results for the two genders. Typically, researchers examine the first column (i.e., r_{all}), which pools all participants regardless of their implicit attitudes. The next two columns separate those with a low implicit score showing preference for the L1 group (the $r_{\text{L1-pref}}$ column) from those with a high implicit score showing preference to the L2 group (the $r_{\text{L2-pref}}$ column). The crucial part is the last column. It examines whether the correlation coefficients in the $r_{\text{L1-pref}}$ and $r_{\text{L2-pref}}$ columns differ significantly. (That is, two correlation coefficients might be different [e.g., .20 vs. .22] but the *magnitude* of this difference may not be large enough to warrant statistical significance.) This column reports Fisher's *r*-to-*z* transformation, which is a standard approach to comparing the magnitude of two correlation coefficients (e.g., Kenny, 1987, p. 275). Dörnyei and Chan (2013) for example have used it to compare correlation pairs related to the motivation to learn two different languages.

Table 6.7: Correlations for males and females comparing the overall sample, those with L1 and L2 implicit preference, and the difference between the latter two groups.

Scales		r_{all} ($n = 257$)	$r_{\text{L1-pref}}$ ($n = 128$)	$r_{\text{L2-pref}}$ ($n = 129$)	z
Male	Explicit <i>D</i> Measure	.14*	-.08	.21*	2.32*
	Implicit <i>D</i> Measure				
	Explicit <i>D</i> Measure	.18**	.03	.33***	2.48*
	Attitudes to L2 Speakers				
	Explicit <i>D</i> Measure	.13*	-.04	.29***	2.68**
	Attitudes to L2 Learning				
	Attitudes to L2 Learning	.21***	.09	.32***	1.91†
	Attitudes to the English—SDS				
	Attitudes to L2 Learning	-.08	.08	-.23**	2.49**
	Fear of Assimilation				
	Attitudes to L2 Speakers	.31***	.04	.32***	2.31*
	Ideal L2 Self				
	Implicit <i>D</i> Measure	-.27***	-.11	-.34***	3.68***
	Fear of Assimilation				
	Implicit <i>D</i> Measure	-.19**	-.01	-.22**	1.69†
Ethnocentrism					
Implicit <i>D</i> Measure	-.21***	-.05	-.29**	1.97*	
Religious Attitudes					
Implicit <i>D</i> Measure	-.12*	.05	-.19*	1.92*	
Attitudes to Arabs					
Attitudes to L2 Speakers	-.13*	-.06	-.27**	1.72†	
Fear of Assimilation					
Attitudes to L2 Speakers	.03	.18*	-.10	2.24*	
Attitudes to Arabs—SDS					
Scales		r_{all} ($n = 108$)	$r_{\text{L1-pref}}$ ($n = 54$)	$r_{\text{L2-pref}}$ ($n = 54$)	z
Female	Attitudes to L2 Speakers	.34***	.05	.61***	3.33***
	Attitudes to L2 Learning				
	Implicit <i>D</i> Measure	-.02	-.08	.29*	1.91†
	Ideal L2 Self				
	Explicit <i>D</i> Measure	-.12	.08	-.29*	1.91†
	Ethnocentrism				
	Attitudes to L2 Learning	-.09	-.32*	.11	2.23*
Implicit <i>D</i> Measure					
Attitudes to the English—SDS	.06	.27*	-.18	2.32*	
Ethnocentrism					

Note. All hypotheses two-tailed. SDS = semantic differential scale.

† $p < .10$, * $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$

Table 6.7 shows a total of 17 instances in which pairs of correlation coefficients differed significantly between the two subgroups (the full correlation tables are available in Appendix C). As mentioned above, the r_{all} column—which does not take implicit attitudes into account—is the one typically examined by researchers. However, when the participants were separated based on their implicit attitudes, the correlations of the L1 preference participants dropped to non-significance in 14 instances, whereas the correlations of the L2 preference participants became even stronger. For example, for females, Attitudes toward L2 Speakers and Attitudes toward L2 Learning appeared moderately correlated for the overall sample ($r = .34$), which is the expected result from the literature. However, the next two columns show that this pattern actually holds only when implicit attitudes toward the L2 group are favorable, and disappears for the other group. This suggests that pooling these two different groups can be misleading.

In the only three instances in which this pattern was reversed, the correlations that emerged for those with L1 preference were theoretically somewhat unexpected. It is not clear why the women had a *negative* correlation between L2 learning attitudes and implicit attitudes toward L2 speakers, or why the more they rated the English favorably the more they were also ethnocentric. Also, the men tended to rate the two groups similarly as if they did not see much difference between them. These results suggest that learners with lower implicit attitudes do not seem to follow theoretically expected patterns. Future research is needed to shed more light on the motivation of this group of learners.

Again, this effect is more marked for males than females, as fewer significant differences emerged from the female subsample. This pattern supports the results of RQ 1 above showing that implicit attitudes play a larger role for males. Overall, therefore, the results demonstrate that pooling learners without regard to their level of implicit attitudes carries the danger of masking salient internal differences that may in turn suppress the overall correlation coefficient⁶.

⁶ The Bonferroni correction was not implemented in this part of the analysis following the convention in the field. Language motivation researchers do not correct for multiple comparisons when they use correlations (like those in Table 6.5), and the present analysis is intended to show what the results might look like when implicit attitudes are taken into account. Still, future research should attempt to replicate the results using this instrument, and this potential limitation is acknowledged here.

RQ 3: Do implicit attitudes moderate the L2 MSS?

This question examined whether implicit attitudes moderate the relationship between (explicit) Attitudes toward L2 Speakers and the Ideal L2 Self, and between the Ideal L2 Self and Attitudes toward Learning English. A multi-group SEM analysis was conducted using Amos 22 (J. L. Arbuckle, 2013). The SEM analysis followed the recommended two-step approach of examining the measurement model before proceeding to the structural model (see Fornell & Larcker, 1981).

The SEM measurement model. This part of the analysis involves a confirmatory factor analysis (CFA) with the aim of establishing the construct validity of the three latent variables used in the SEM analysis, which is a crucial step in any SEM analysis. Both convergent and discriminant validity were examined. To examine convergent validity, i.e. that the indicators satisfactorily represent their latent constructs, three aspects were investigated. First, construct reliability (also called composite reliability) was computed. In the context of latent variables, reliability is calculated differently from the classical approaches, such as Equations (6.2) and (6.3) that were discussed above. Construct reliability is computed using this formula:

$$\rho_{\eta} = \frac{(\sum_{i=1}^p \lambda_{yi})^2}{(\sum_{i=1}^p \lambda_{yi})^2 + \sum_{i=1}^p Var(\varepsilon_i)} \quad (6.4)$$

where the reliability of the latent variable η is a function of the squared sum of the standardized factor loadings (λ) and the sum of the error variances of (ε). Construct reliability is not computed automatically by SEM software, and so the user must calculate it him-/herself from the CFA output using Equation (6.4). The rule of thumb for construct reliability is that it should be .70 or higher, which was satisfied for the three constructs as shown in Table 6.8.

Second, the average variance extracted (AVE) was computed. The AVE aims to establish whether the variance captured by the latent variable is larger than the variance due to measurement error. The AVE can be computed as follows:

$$\rho_{vc(\eta)} = \frac{\sum_{i=1}^p \lambda_{yi}^2}{\sum_{i=1}^p \lambda_{yi}^2 + \sum_{i=1}^p Var(\varepsilon_i)} \quad (6.5)$$

where the average variance extracted (ρ_{vc}) of latent variable η is a function of the sum of the squared standardized factor loadings (λ) and the sum of the error variances of (ϵ). A variation of Equation (6.5) is to simply use the number of items (k) in the denominator. These two variations are equivalent. Again, the AVE values is not computed automatically by SEM software, and so the user has to calculate it for each latent variable from the CFA output using Equation (6.5). As a rule of thumb, the AVE should be .50 or higher. Attitudes toward English-Speaking People satisfied this recommendation, but each of the Ideal L2 Self and Attitudes toward Language Learning had to have one item dropped. This improved their AVE to a satisfactory level (see Table 6.8).

A final rule of thumb for convergent validity suggests that the standardized factor loadings of each indicator variable should be .50 or higher. All factor loadings were statistically significant and higher than this threshold except for one indicator of Attitudes toward Language Learning that was just under this threshold (.46). The overall trend, therefore, suggested acceptable convergent validity.

To examine discriminant validity, i.e. that the constructs are sufficiently distinct from each other, the recommended measure is that the AVE values should be greater than their respective inter-construct correlations squared. The rationale behind this rule of thumb is that the construct should explain more of the variance of its items than it shares with other constructs (Hair, Black, Babin, & Anderson, 2010). This was also satisfied as shown in Table 6.8. This can be verified by noting that the each value in the diagonal is always larger than the correlations of its respective construct with the other two constructs.

Finally, most standardized residuals did not exceed the recommended threshold of ± 2.0 , suggesting that the observed covariance terms fitted the estimated covariance terms. The fit of the measurement model was also acceptable, $\chi^2(175) = 391.517$, $p < .001$, $\chi^2/df = 2.237$, CFI = .937, TLI = .909, RMSEA = .034, PCLOSE = 1.00⁷. These results suggested that the measurement model was satisfactory and that it was safe to proceed to the structural model.

⁷ According to the publication manual of the American Psychological Association (2010): “Use a zero before the decimal point with numbers that are less than 1 when the statistic can exceed 1.... Do not use a zero before a decimal fraction when the statistic cannot be greater than 1 (e.g., correlations, proportions, and levels of statistical significance)” (p. 113). Since the TLI fit index is ‘nonnormed’ in that its value can sometimes exceed 1.0, it should have been written as 0.909 (i.e., with a zero before the decimal). However, since it exceeds 1.0 only in special and rare cases, the convention is not to use a zero before the decimal and to treat it like the other fit indices.

Table 6.8: Reliability and validity of the constructs in the measurement model and their inter-construct correlations.

	CR	AVE	1	2	3
1. Attitudes to Language Learning	.741	.503	.709		
2. Ideal L2 Self	.745	.494	.356	.703	
3. Attitudes to English-Speaking People	.853	.662	.406	.165	.813

Note. CR = construct reliability, AVE = average variance extracted. Values in the diagonal are the square roots of their respective AVE.

The structural model. Before multi-group SEM analysis can be justifiably performed, the measurement invariance must be established. The measurement invariance aims to find out whether the groups to be compared do not substantially differ in terms of how they have understood and responded to the various items. Measurement invariance has three primary levels: configural, metric, and scalar. For the purpose of comparing structural coefficients, rather than latent means, satisfying the first two levels (configural and metric) is sufficient. In the present analysis, full metric invariance was achieved, in that all factor loadings of the three factors were equivalent between the two groups. The residuals of Attitudes toward English-Speaking People and Attitudes toward Language Learning covaried with each other (.45), possibly due to their shared underlying theme related to aspects of the L2 culture. None of the standardized residuals exceeded ± 2.5 , suggesting a very good fit between the observed and estimated covariance terms. The structural model also had an adequate fit, $\chi^2(75) = 199.701$, $p < .001$, $\chi^2/df = 2.663$, CFI = .945, TLI = .921, RMSEA = .048, PCLOSE = .660. There were no missing data to handle in this part of the analysis because the computer program reminded the participant if s/he left an item unanswered.

The results for the overall sample (see Figure 6.3, above the arrows; see also Table 6.9) show that both paths are statistically significant. Again, these are the typical results researchers obtain when they do not take implicit attitudes into account. However, when implicit attitudes were taken into account, a different picture emerged. Learners with an L2 preference outperformed their L1 preference counterparts in the path from Attitudes toward English-Speaking People to the Ideal L2 Self ($z = 1.88$, $p < .10$), while the opposite pattern emerged in the other path ($z = 2.48$, $p < .05$).

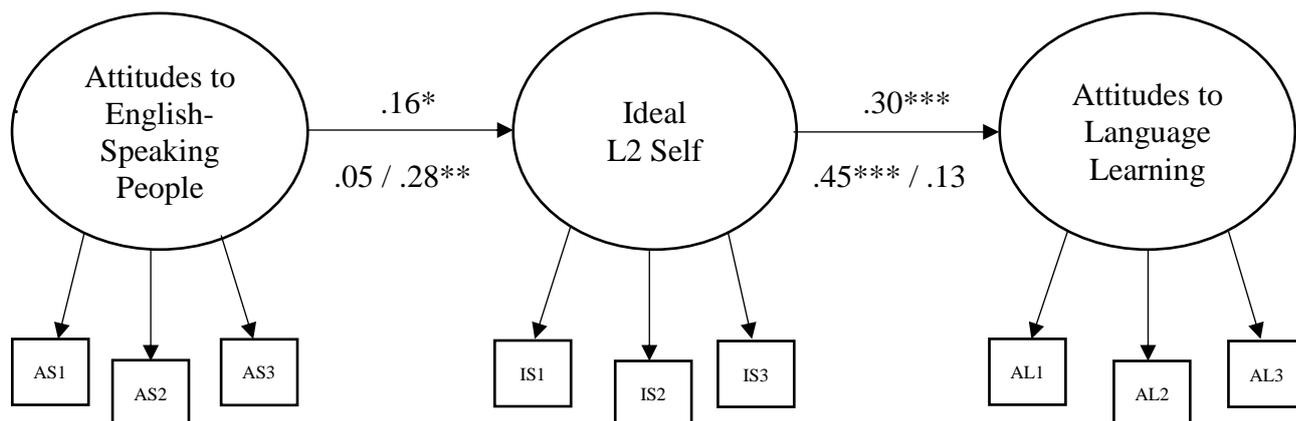


Figure 6.3: Standardized structural coefficients of final model for all participants (above the arrows) and for those who had L1 vs. L2 implicit preference (under the arrows). Structural coefficients and factor loadings are detailed in Tables 6.9 and 6.10, respectively. Error terms and their covariances were deleted for simplicity.

*** $p < .001$

** $p < .01$

* $p < .05$

Table 6.9: Standardized and unstandardized coefficients, standard errors, and critical ratios in the final model for the overall sample, and for participants with L1 vs. L2 implicit preference.

Path	Group	β	B	SE	CR
Attitudes to English-Speaking People → Ideal L2 Self	Overall	.16	0.13	0.05	2.51*
	L1-pref	.05	0.04	0.07	0.51
	L2-pref	.28	0.23	0.08	3.09**
Ideal L2 Self → Attitudes to L2 Learning	Overall	.30	0.40	0.09	4.48***
	L1-pref	.45	0.62	0.14	4.34***
	L2-pref	.13	0.17	0.12	1.45

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Table 6.10: Standardized and unstandardized factor loadings, standard errors, and critical ratios in the final model for the overall sample, and for participants with L1 vs. L2 implicit preference.

Path	Group	β	<i>B</i>	<i>SE</i>	<i>CR</i>	
Attitudes to English-Speaking People →	AS1	Overall	.83	1.40	0.10	14.24***
		L1-pref	.84	1.49	0.17	8.10***
		L2-pref	.81	1.32	0.12	11.03***
	AS2	Overall	.71			
		L1-pref	.66		—	
		L2-pref	.75			
	AS3	Overall	.89	1.32	0.09	14.40***
		L1-pref	.87	1.47	0.16	8.95***
		L2-pref	.93	1.24	0.11	11.67***
Ideal L2 Self →	IS1	Overall	.74	1.16	0.12	9.46***
		L1-pref	.78	1.31	0.21	6.23***
		L2-pref	.70	0.98	0.14	7.17***
	IS2	Overall	.71	1.08	0.12	9.46***
		L1-pref	.69	1.13	0.18	6.24***
		L2-pref	.73	1.01	0.14	7.23***
	IS3	Overall	.65			
		L1-pref	.59		—	
		L2-pref	.73			
Attitudes to L2 Learning →	AL1	Overall	.76	0.81	0.05	15.23***
		L1-pref	.69	0.80	0.09	9.04***
		L2-pref	.80	0.80	0.07	12.41***
	AL2	Overall	.85			
		L1-pref	.83		—	
		L2-pref	.87			
	AL3	Overall	.46	0.75	0.09	8.35***
		L1-pref	.42	0.78	0.15	5.17***
		L2-pref	.50	0.73	0.11	6.73***

Note. *** $p < .001$

Exploring the Religious Attitudes scale

In this Study, a new scale was constructed to measure the participants' self-reported level of religiosity. Because of the centrality of religion to many Arabs, this section explores the relationship between religiosity and language learning. A *t*-test was conducted based on a median-split of the Religious Attitudes scale in order to compare learners with high versus low levels of religiosity. The results are in Table 6.11. These results are somewhat comparable to those presented in Table 6.5 earlier. However, the advantage of this additional analysis is that, in the Study 2, the *t*-values will be synthesized using Bayes factors.

Table 6.11: Differences between participants with low ($n = 178$) and high ($n = 152$) religiosity.

Scale	Religiosity	<i>M</i>	<i>SD</i>	<i>t</i>	<i>d</i>
Ideal L2 Self	Low	1.96	0.78	0.02	0.00
	High	1.96	0.74		
Ought-to L2 Self	Low	0.74	1.31	0.70	0.08
	High	0.84	1.21		
Fear of Assimilation	Low	-0.37	1.29	5.92***	0.58
	High	0.44	1.16		
Ethnocentrism	Low	-1.22	1.08	9.97***	1.09
	High	0.03	1.20		
Attitudes to English-Speaking People	Low	1.57	1.09	0.09	0.01
	High	1.56	1.03		
Attitudes to L2 Learning	Low	1.68	0.83	1.90	0.21
	High	1.86	0.88		
Attitudes to Arabs—SDS	Low	0.52	0.89	5.15***	0.57
	High	1.01	0.83		
Attitudes to the English—SDS	Low	0.82	0.71	1.10	0.13
	High	0.72	0.80		
Explicit <i>D</i> Measure	Low	0.25	1.08	4.63***	0.51
	High	-0.31	1.10		
Implicit <i>D</i> Measure	Low	-0.67	0.65	3.05*	0.33
	High	-0.87	0.55		

Note. Bonferroni correction implemented. SDS = semantic differential scale.

* $p < .05$, *** $p = .001$

Virtually all the significant results reported in Table 6.11 are for variables concerned with intergroup relations, in that those reporting lower religiosity were more open to the L2 community. This pattern therefore suggests that religiosity is more than just a belief concerning a deity, but also has interpersonal and intergroup implications. This pattern also

supports the use of this scale as a further measure of L1 group affiliation. Interestingly, this scale is related even to implicit attitudes, and not just explicit attitudes, toward L2 speakers. Considering that openness to the L2 community (real or imagined) is considered an important factor in L2 learning, religious attitudes therefore seem a potentially interesting aspect in understanding language learning motivation for Arab learners.

The p -values reported in Table 6.11 are Bonferroni-corrected adjusting for 10 exploratory comparisons. Therefore, only highly significant differences survived this adjustment. For example, the difference between learners with high versus low religiosity would have been marginally significant for Attitude toward L2 Learning (with the t -value approaching 1.96, which is associated with the 5% level of significance). This significance disappeared after implementing the Bonferroni correction. This could be a genuine difference that was lost after the Bonferroni correction, or it could be merely due to chance. Study 2 explores the Religious Attitudes scale further, shedding more light on these results.

6.2.3 Discussion

Conventional language motivation theories tend to portray language learners as rational agents, varying along one (conscious) dimension: a continuum from high to low motivation. This is evident both in theoretical discussions and in actual empirical investigations where self-report questionnaires and interviews are predominant. This Study has presented the first attempt in the L2 field to use the Implicit Association Test to examine language learners' implicit attitudes. The results are encouraging. They demonstrate that another (unconscious) dimension has important implications for language learning motivation. Perhaps the most interesting finding in this Study is that explicit and implicit attitudes can potentially be incongruent, and that incongruent learners subsequently exhibit less openness to the L2 community. The implicit attitudes construct may therefore have the potential to move the field forward toward interesting directions.

This Study has provided support for the notion that implicit attitudes toward L2 speakers are relevant to language learning motivation. More specifically, language learners who exhibited preference for L2 group (over the L1 group) in the implicit test, also reported more openness to this L2 group. This was represented in significantly more favorable attitudes toward L2 speakers and less favorable attitudes toward Arabs and, on the other hand, in lower levels of ethnocentrism, fear of assimilation, and religious attitudes. This is in line with a long-standing principle in the L2 motivation field, namely that language learning is facilitated by a positive disposition toward the L2 community (real or imagined). The

present results add a further layer of complexity to this principle, namely that attitudes need to be positive at the implicit level also in order to attain more openness to the L2 community.

The present results also show that there is a systematic association between explicit and implicit attitudes toward L2 speakers. This finding may be seen as lending support to the validity of the Implicit Association Test. That is, one way to investigate the validity of a construct is to examine its convergent and discriminant validity. Convergent validity requires that constructs sharing some similarity to successfully correlate with each other; discriminant validity requires that constructs not sharing this similarity not to correlate as strongly with each other. The Implicit Association Test has already demonstrated these patterns in various domains in the psychological literature (Greenwald et al., 2015). The present results (e.g., Table 6.5) show that the scores from Implicit Association Test correlated to a statistically significant level only with scales related inter-group relations, while not correlating with any of the other variables included in this Study. This pattern therefore corroborates the psychological literature supporting the validity of scores derived from this test. The present results add to this literature by showing that such meaningful patterns also emerge in the context of language learning. Study 2 addresses convergent and discriminant validity further using a different approach.

These results also support Higgins's (e.g., Higgins, Shah, & Friedman, 1997; Shah & Higgins, 2001) argument that self-guides can be investigated using reaction-time measures. As reviewed in Chapter 3, Higgins argued strongly against the utility of self-report measures in studying self-guide discrepancies. Reaction-time measures, on the other hand, can reveal aspects about self-guides that one is unaware of. This is because reaction time is sensitive to the accessibility and activation of one's self-guides. In the present Study, the participants were asked to associate positive and negative attributes, such as *Honest* and *Dishonest*, with Arabic and English speakers. The ones who were able to associate positive attributes with English speakers more easily are the ones who have more activation and accessibility to positive self-guides related to speakers of the L2 community. This interpretation reinforces the above analysis of the need to add another layer of complexity to openness to the L2 community. Openness does not have to be restricted to explicit attitudes reported in questionnaires and interviews, but may also extend to implicit attitudes that require alternative measures such as those that are based on reaction time.

The results have also shown that implicit attitudes can shed new light on existing results. Both in the context of correlation and SEM analyses, learners with different levels of implicit attitudes exhibited different patterns of association. In the context of correlations,

learners with higher (vs. lower) implicit scores had significantly stronger correlations among attitudinal and motivational variables. This suggests that pooling them can potentially produce misleading results. In the context of SEM, attitudes toward L2 speakers predicted the ideal L2 self only for learners with higher implicit scores. This suggests that learners resort to the L2 group to develop their ideal L2 selves only when their implicit attitudes toward that group are already favorable. This makes sense. In order for the learner to adopt members of the L2 group as ideals of a language speaker, s/he first needs to have a positive attitude toward them. The present results suggest that this positivity need to be both at the explicit and implicit levels. On the other hand, the ideal L2 self predicted attitudes toward L2 learning only for learners with lower implicit attitudes. It seems that learners with higher implicit scores do not require much conscious effort in resorting to their ideal L2 selves to remain motivated; their motivation may be maintained spontaneously. When implicit attitudes are low, however, it probably becomes more urgent to develop and cultivate a conscious ideal L2 self to guide one's motivation and sustain it over time. Thus, implicit attitudes seem to reveal a more nuanced picture of language learning motivation, showing different motivational dynamics underlying learners with high versus low implicit test scores.

Implicit attitudes also appeared more relevant to males than to females. The above-mentioned results were consistently more salient for males. This supports previous research showing that females tend to exhibit more positivity toward languages (vs. math and science) both explicitly and implicitly, and consequently females may have less reason to develop explicit–implicit incongruence. Implicit attitudes may therefore be a valuable pathway for a better understanding of gender differences in language learning.

The present results also offers support for the utility of religious attitudes for Arab learners as a further indicator of openness to the L2 group. That religious attitudes were associated with less openness to the L2 group is in line with previous research showing that religiosity can be a hindrance to integrating with the host community, especially in Europe. It is still unclear to what extent this would be useful in societies in which religion is not a salient aspect. Overall, thus, the results of Study 1 are encouraging. Study 2 builds and expands on Study 1.

6.3 Study 2⁸

Although it has found support for all of its research questions, Study 1 still has a number of limitations. First, the participants in Study 1 chose to travel to the UK to study English, and so these learners might not be representative of others who either cannot travel abroad or do not want to do so. Individuals living in foreign language contexts represent the majority of language learners today. Additionally, because the sample in Study 1 were all students at British universities and language institutes, both the questionnaire items and the implicit test addressed attitudes toward British people specifically. Therefore, it is not clear whether the same results would emerge if the instruments were concerned with English speakers in general and were administered to a sample of learners in a foreign language context—as is the standard practice in most language research today. Study 2 therefore overcame this limitation by recruiting learners living a foreign language context, and by defining the concept of English speakers more broadly, rather than limiting it to British people.

A second limitation in Study 1 is that the sample came from various universities and language institutes and from various levels of study, and so it was not possible to obtain a standardized measure of their academic achievement in the L2. Including a measure of language achievement would be desirable as it would allow investigating whether implicit attitudes are also related to academic outcomes. These learners also come from various countries in the Arab world, each with its own culture and background. Study 2 dealt with this limitation by recruiting a sample of learners from one institution (in Saudi Arabia). At this institution, students study a standardized curriculum and take the same exams and quizzes. The students were all in their foundation year, receiving intensive English instruction before moving to their engineering or business majors. This institution is not selective, and so students come from various levels of English proficiency and from many parts of the country.

A further limitation in Study 1 is that the Implicit Association Test is a relative measure by design. As explained in Chapter 5, the results of the Implicit Association Test are ambiguous. A positive score does not necessarily mean a positive attitude toward one group and a negative attitude toward the other. It only means that the learner has a more positive attitude toward one over the other. Similarly, obtaining a neutral score might mean that the participant is indifferent to the two groups, but it might also be that s/he equally likes or dislikes both groups. This is why Study 1 has referred to learners as having L1 versus L2

⁸ Part of this Study has appeared in Al-Hoorie (2016b).

preference, rather than having a positive versus negative attitude toward one over the other. Study 2 therefore utilized the Single-Target Implicit Association Test (ST-IAT, Wigboldus et al., 2004), which promises more absolute scores of implicit attitudes, in order to examine whether similar results would be obtained.

Another limitation in reaction-time measures in general is that it is not clear what their scores represent (e.g., Greenwald et al., 2015; Greenwald et al., 2009; Oswald et al., 2013; Rudman, 2008). As reviewed in Chapters 4 and 5, scores from implicit tests might indeed represent implicit attitudes, but they might also represent certain cognitive aspects such as working memory capacity or better task-switching skills. An efficient way of controlling for such potential confounds is to administer another irrelevant implicit test. If the implicit scores are a result of such confounds and artifacts, this should apply equally to the two tests and therefore conclusions derived from the two tests should be very similar. On the other hand, if we obtain different results, this means that the content of the test matters and it is not just a matter of cognitive ability. Another advantage of using two different tests is that this approach would also reveal whether those who perform faster are simply the ones take the test more seriously, such as to please the researcher. If this is the case, these participants would obtain similar scores regardless of which implicit test they take. Therefore, Study 2 included an additional implicit test as a measure of attitudes toward the L2 course. In order for the implicit test to be valid, it was expected that implicit attitudes toward L2 speakers would be related to L2 group affiliation, but implicit attitudes toward the L2 course (which reflect the here and now) would not.

Using two implicit tests can also help shed light on construct validity. In Study 1, the correlational patterns of the implicit test showed that it correlated only with variables related to intergroup relations, and not with variables unrelated to intergroup relations. These two patterns were considered as evidence of convergent and discriminant validity, respectively. Both convergent and discriminant validity contribute to construct validity. In Study 2, construct validity was addressed using a different approach, namely through the use of two implicit tests. The two implicit tests were concerned with two different targets: L2 speakers and the L2 course. Although these two targets are different, they are also sufficiently related to each other. Obtaining meaningful results from these two different implicit tests would provide compelling evidence of the construct validity of the implicit scores.

In addition, the results from the implicit test in Study 1 were interpreted as reflecting implicit attitudes. However, these results could plausibly be interpreted as reflecting social desirability responding. That is, the participants who reported positive attitudes toward L2

speakers—but then obtained low scores in the implicit test—may have simply been trying to present themselves favorably by reporting that they like L2 speakers. The low scores in the implicit test do not necessarily mean that the respondent has negative *implicit* attitudes which they were unaware of. In other words, if these participants were to respond to the questionnaire items more frankly, they would have revealed less positive attitudes toward the L2 group, just like their scores on the implicit test.

Study 2 therefore included a measure of social desirability. If a scale is sensitive to social desirability, that could be a reason for concern. Responses to that scale may be inflated by some participants who are high on social desirability. In recognition of this possibility, some early studies in L2 motivation research examined social desirability. For example, Gardner, Lalonde, and Moorcroft (1985) argued that there was “virtually no evidence” (p. 219) of an association between the Attitude/Motivation Test Battery and social desirability. However, Gardner and Glikzman (1982) reported that social desirability did have a correlation of .40 with motivational intensity, a magnitude the authors described as “substantial” (p. 197). To the extent that the ‘intended effort’ scale is concerned with motivated behavior, it is conceptually similar to Gardner’s ‘motivational intensity’. Therefore, it is possible that intended effort would similarly be prone to social desirability biases. In a more recent study, Gardner and MacIntyre (1991) utilized a measure of social desirability but it resulted in a very low internal consistency coefficient ($\alpha = .23$), which the authors attributed to the use of Likert items instead of the original true–false format. Because of this, Study 2 used the original dichotomous response format.

Study 2 posed two research questions. First, it compared the motivational profiles of language learners with different academic achievement levels. The goal was to find out which of motivational variables in Study 1, as well as the two new implicit tests, would be able to successfully discriminate between high- versus low-achieving learners. This research question can be formulated as follows:

RQ 1: Do high- and low-achieving Saudi learners of English differ in their attitudinal and motivational orientations?

Second, Study 2 attempted to replicate the most important finding of Study 1, namely that congruent learners (i.e., those with positive attitudes toward L2 speakers both explicitly and implicitly) would show more affiliation with the L2 group than would incongruent learners (i.e., those with positive explicit, but negative implicit attitudes):

RQ 2: Compared with incongruent learners, do congruent Saudi learners of English exhibit more openness to the L2 group?

For both research questions, social desirability was included as an explicit control, while the additional implicit test—concerned with the L2 course—was used as an implicit control. Since Study 1 found that the results were more salient for male rather than female learners, Study 2 recruited an all-male sample in order to examine this effect more closely.

Finally, Study 2 included some additional exploratory analyses. It builds on the analysis of the Religious Attitudes scale presented in Study 1. Study 2 also explored a Parental Support scale, since this variable has received little attention in the literature especially with young adult learners. The analysis explored its relationship with explicit and implicit attitudes.

6.3.1 Method

Participants

A total of 311 participants qualified for the final analysis after excluding those who did not complete all study tasks or who responded randomly to the implicit test (see Data analysis below for more details). The qualifying participants (18–24 years old, $M = 19.8$, $SD = 0.95$) were Arabic L1 males studying English language as a foundation-year requirement at an all-male higher education institution in Saudi Arabia. The majority (over 85%) had never visited an English speaking country. Less than 10% had lived in an English speaking country for a maximum of three months, while less than 5% had stayed there for a longer duration. All participants took part in the present Study on a voluntary basis.

Materials

Implicit measures: The Single-Target Implicit Association Test (ST-IAT, Wigboldus et al., 2004) was adapted to measure attitudes toward L2 speakers and toward the L2 course separately. Performing the ST-IAT requires pressing a left or right button on the keyboard in order to rapidly categorize a series of stimuli appearing in the center of a computer screen. Table 6.12 gives an overview of the L2 Speakers ST-IAT. In the first block, the participants practiced 20 times categorizing words as either *Pleasant* or *Unpleasant*. Then the actual test started. In the first condition, Blocks 2 and 3, *Pleasant* was paired with *L2 Speakers* (see Figure 1). In the other condition, Blocks 4 and 5, *L2 Speakers* moved to the other side to pair up with *Unpleasant*. Before each block, the participants read instructions and were reminded

to perform as fast as possible. The L2 Course ST-IAT followed the same format but used *L2 Course* in place of *L2 Speakers* (see Appendix A for the stimuli used). All participants were taking this type of test for the first time. Each ST-IAT took less than 10 minutes to complete.

Table 6.12: Overview of the L2 Speakers Single-Target Implicit Association Test.

Block	Trials	Function	Response key assignment	
			Left button (E)	Right button (I)
1	20	Practice	Pleasant	Unpleasant
2	40	Test 1a	Pleasant or L2 Speakers	Unpleasant
3	80	Test 1b	Pleasant or L2 Speakers	Unpleasant
4	40	Test 2a	Pleasant	Unpleasant or L2 Speakers
5	80	Test 2b	Pleasant	Unpleasant or L2 Speakers

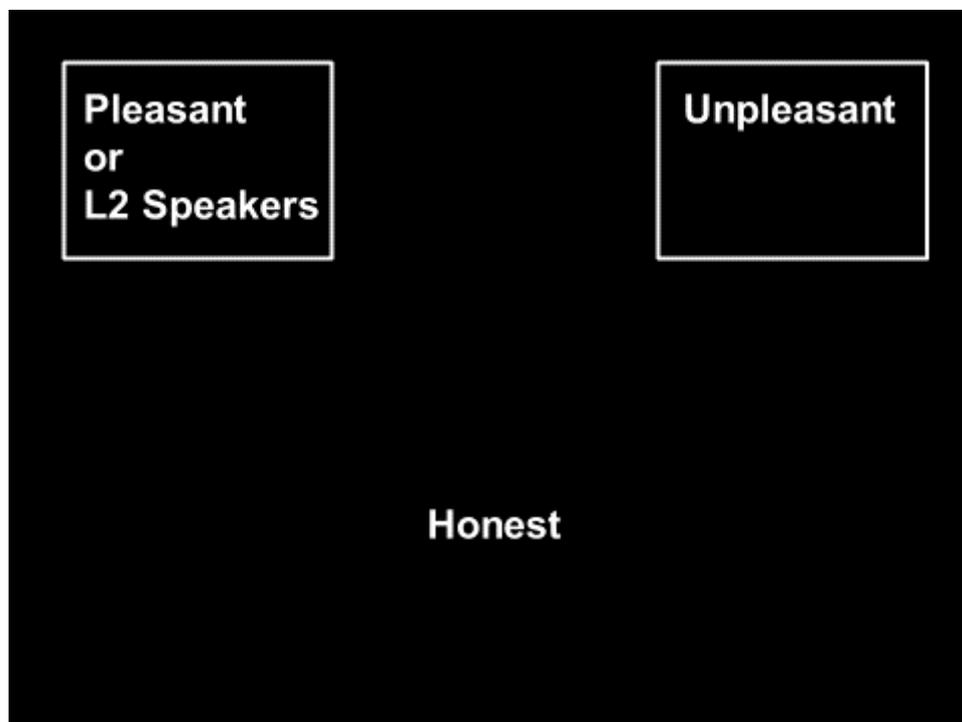


Figure 6.4: A trial of the L2 Speakers ST-IAT. The correct answer here would be the left button (E) because the stimulus *Honest* belongs to *Pleasant*.

The stimuli were randomly drawn without replacement from *Pleasant*, *Unpleasant*, and *L2 Speakers* or *L2 Course* where appropriate. A red X appeared when an incorrect response was given, and the participant had to correct the error before proceeding. Split-half analyses based on even-versus-odd trials showed that both the L2 Speakers ST-IAT (Spearman–Brown’s $\rho = .73$) and the L2 Course ST-IAT ($\rho = .72$) had good reliabilities. The

ST-IAT scores were coded so that a higher score reflected a more positive attitude. The software used was Inquisit 4 (2014).

Explicit measures: The participants also completed 10 self-reported attitudinal and motivational scales relevant to explicit and implicit dispositions (scale reliabilities are discussed in the Results section):

- 1) *The Ideal L2 Self* (4 items). Example: I can imagine myself mastering English one day.
- 2) *The Ought-to L2 Self* (4 items). Example: I must study English because it will earn me respect in the society.
- 3) *Intended Effort* (5 items). Example: I am prepared to expend a lot of effort in learning English.
- 4) *Family Support* (4 items). Example: My parents encourage me to study English.

A higher score in each of the above four scales indicated stronger endorsement. Three other scales were concerned with the degree of affiliation with the L1 group:

- 5) *Fear of Assimilation* (5 items), adapted from S. Ryan (2009). Example: I think that the interest in the West has a negative influence on the Arab culture.
- 6) *Ethnocentrism* (2 items), adapted from Neuliep and McCroskey (1997). Example: I find it difficult to work together with people who have different customs.
- 7) *Religious Attitudes* (6 items), adapted from Study 1. Example: When I see a non-Muslim, the idea of sharing my Islamic faith with them comes to my mind immediately.

A higher score in each of these three scales reflected stronger L1 affiliation. The above seven scales all involved seven-point Likert scales.

- 8) *Social Desirability* (28 true–false items), adapted from Crowne and Marlowe (1960). Example: My table manners at home are as good as when I eat out in a restaurant.

A higher score in this scale reflected higher social desirability. Finally, the participants also responded to two semantic differential scales:

- 9) *Attitudes toward L2 Speakers* (10 bipolar adjective scales), concerned with individuals whose L1 is English.
- 10) *L2 Learning Experience* (8 bipolar adjective scales), concerned with attitudes toward the L2 course.

The adjectives used in these two scales were based on the stimuli of implicit tests. All materials in the explicit and implicit measures were translated into Arabic to avoid language interference. The complete list of questionnaire items is available in Appendix B.

Procedure

The participants completed the study tasks in small groups in a laboratory. The participants were informed at the beginning that the current Study was part of a research project at a British university, which incidentally might have activated their social desirability. Each participant first responded to items randomly drawn in a fixed order from the seven Likert scales, and then to the L2 speakers and to L2 learning experience semantic differential scales. Afterwards, they completed the two implicit measures with the social desirability scale in between. The order of the two implicit tests was counterbalanced, but this did not have an effect on responses either to the L2 Speakers ST-IAT ($d = .02$) or to the L2 course ST-IAT ($d = .05$).

The participants' final achievement in the L2 course (on a 9-point scale ranging from A+ to F) was obtained. At the institution in question, students learn the four skills as well as vocabulary and grammar. They are taught by at least three different teachers who assess them independently, mostly through computerized, objective testing. Tests and quizzes follow the curriculum taught closely, and so high achievement requires dedication and effort from the learner. Therefore, it seems reasonable to use grades at this institution as a fair reflection of L2 achievement.

Still, one particular difficulty in using real-life course grades is that the researcher is rarely in full control of the process. On the other hand, examining real-life academic achievement is also important because it is a meaningful outcome in educational settings. As an additional step to make the achievement variable more interpretable, learners were considered high achievers if they obtained A or B, and low achievers if they obtained D or F. This procedure excluded learners in the middle, gray area. Still, because it might seem artificial, this dichotomization procedure was used only when the aim was to compare high versus low achievers. The full 9-point achievement measure was used for the rest of the analysis. As detailed below, both approaches led to positive results supporting the relevance of implicit attitudes.

Data analysis

The analysis of the implicit tests closely followed the improved scoring algorithm, called the *D* Measure, recommended by Greenwald, Nosek, and Banaji (2003). The four test blocks

were included in the analysis, and the latency of each incorrect response was replaced with the block mean plus 600 ms error penalty. Participants with more than 10% latencies faster than 300 ms—an indication of random responding—were excluded, while responses longer than 5,000 ms were removed. The responses from the social desirability scale were summed to obtain a score with a maximum of 24. All other measures, explicit and implicit, were rescaled so that they centered on zero and ranged from +3 to −3.

6.3.2 Results

The measurement model

Just like Study 1, the reliabilities (α and ρ) and the homogeneity of each scale are reported in Table 6.13. The results show generally satisfactory levels of reliability and homogeneity. Social desirability was three-dimensional as expected but was left intact in order to use the full version ($\alpha = .66$, $\rho = .63$), though reliability has no straightforward interpretation with multidimensional scales. Inspection of Q–Q plots also showed that the variables are reasonably normally distributed.

Table 6.13: Reliability and homogeneity of the scales.

Scale	No. of items	α	ρ	H
Ideal L2 Self	4	.80	.82	.56
Ought-to L2 Self	4	.65	.73	.46
Intended Effort	5	.67	.68	.34
Family Support	4	.57	.63	.37
Fear of Assimilation	5	.72	.72	.35
Ethnocentrism	2	.59	.60	.44
Religious Attitudes	6	.78	.78	.40
Attitudes to L2 Speakers—SDS	10	.82	.82	.34
L2 Learning Experience—SDS	8	.87	.88	.51

Note. H = scale homogeneity.

Descriptive statistics

The first two columns Table 6.14 present the descriptive statistics of the variables in this Study. Each of the core variables in the L2 MSS—the Ideal L2 Self, the Ought-to L2 Self, the L2 Learning Experience, and Intended Effort—was highly endorsed by the participants and showed relatively high inter-correlations. Intended Effort also had the strongest correlation with social desirability. As expect, Fear of Assimilation, Ethnocentrism, and Religious Attitudes also correlated with each other.

Table 6.14: Means, standard deviations, and Pearson product-moment correlations among the variables ($N = 311$).

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	12
1. Ideal L2 Self	2.18	0.82	—											
2. Ought-to L2 Self	2.07	0.88	.14**	—										
3. Family Support	1.96	0.90	.25***	.21***	—									
4. Fear of Assimilation	0.51	1.26	-.05	-.08	.08	—								
5. Ethno-centrism	-0.44	1.41	-.09	.05	.09	.21***	—							
6. Religious Attitudes	1.22	1.10	.19***	.09	.28***	.50***	.25***	—						
7. Attitudes to L2 Speakers	1.10	0.83	.13	.22***	.06	-.15**	-.08	-.09	—					
8. L2 Speakers ST-IAT	0.27	0.36	.01	.08	.13*	-.08	-.03	.01	-.03	—				
9. L2 Learning Experience	1.18	1.09	.33***	.20***	.15**	-.09	.00	.06	.26***	.01	—			
10. L2 Course ST-IAT	0.56	0.34	.00	.00	-.06	.01	.03	.01	.06	.26***	.02	—		
11. Social Desirability	13.25	3.71	.12	.04	.10	.07	-.10	.16**	.08	-.01	.12*	-.01	—	
12. Intended Effort	1.76	0.89	.38***	.44***	.21***	-.14**	-.13*	.10†	.25***	.12*	.33***	.06	.21***	—
13. Grades	4.22	2.48	.09	-.09	-.12*	-.12*	-.14*	-.22**	.06	.13*	.17*	-.03	-.03	.00

Note. *** $p \leq .001$, ** $p \leq .01$, * $p < .05$, † $p < .10$. Grades are used here in the full 9-point format ranging from A+ to F.

RQ1: What variables discriminate between high- vs. low-achievers?

The first goal of this Study was to investigate the participants' motivational profiles in order to determine which variables are associated with high versus low achievement. A one-way MANCOVA was conducted to determine the effects⁹ of Achievement (high versus low) on the dependent variables with Social Desirability as a covariate. A few outlying values ($z > \pm 3.3$) were detected and removed in order to satisfy univariate normality; no multivariate outliers were found based on Mahalanobis distance scores, $\chi^2(12) = 32.91, p = .001$. The homogeneity of variance–covariance matrices was assumed, Box's $M = 72.89, F = 1.10, p = .27$. Using Pillai's trace, there was a significant main effect of Achievement, $V = .186, F(11, 252) = 5.25, p < .001, \eta^2_p = .186$. There was also a significant main effect of Social Desirability, $V = .091, F = 2.29, p = .011, \eta^2_p = .091$.

The lower panel of Table 6.15 presents the results. Low achievers significantly outperformed high achievers in the first four variables listed in the table: the Ought-to L2 Self, Family Support, Religious Attitudes, and Ethnocentrism. On the other hand, high achievers scored significantly higher in the next two variables: the L2 Speakers ST-IAT (i.e., implicit attitudes toward L2 speakers) and the L2 Learning Experience (i.e., explicit attitudes toward the L2 course). The remaining variables failed to discriminate between the two groups.

The upper panel of Table 6.15 lists the variables that exhibited proneness to Social Desirability. It is clear that Intended Effort is the most extreme case, while some others were mildly prone to it.

⁹ The use of terms like 'effect' and 'predict' throughout this paper is intended to be in the statistical sense only. The direction of causality cannot be determined by the design of this study, and would require future experimental investigation. This point is discussed further in the next chapter (Section 7.3.1).

Table 6.15: Upper panel: variables exhibiting proneness to Social Desirability as a covariate.

Lower panel: MANCOVA results for low and high achievers.

	Variable	Group	<i>EMM</i>	<i>SE</i>	<i>F</i>	<i>p</i>	η^2_p
Social Desirability	Ideal L2 Self				2.93	.088	.011
	Family Support				3.48	.063	.013
	Ethnocentrism				3.73	.054	.014
	Religious Attitudes				5.91	.016	.022
	Intended Effort				12.62	< .001	.046
Achieve- ment	Ought-to L2 Self	Low	2.20	0.072	7.35	.007	.027
		High	1.93	0.070			
	Family Support	Low	2.16	0.073	8.23	.004	.030
		High	1.87	0.071			
	Religious Attitudes	Low	1.49	0.088	12.37	.001	.045
		High	1.06	0.085			
	Ethnocentrism	Low	-0.22	0.122	6.46	.012	.024
		High	-0.65	0.118			
	L2 Speakers ST-IAT	Low	0.20	0.032	5.88	.016	.022
		High	0.31	0.031			
	L2 Learning Experience	Low	0.95	0.089	9.97	.002	.037
		High	1.34	0.086			
	Ideal L2 Self	Low	2.14	0.070	0.74	.389	.003
		High	2.22	0.068			
	Intended Effort	Low	1.80	0.074	0.40	.528	.002
High		1.73	0.071				
Attitudes to L2 Speakers	Low	1.03	0.072	1.37	.243	.005	
	High	1.14	0.069				
Fear of Assimilation	Low	0.62	0.108	1.08	.299	.004	
	High	0.46	0.105				
Course ST-IAT	Low	0.06	0.030	< 0.001	.975	< .001	
	High	0.06	0.071				

Note. The same pattern emerges when the covariate is excluded. *EMM* = estimated marginal mean, *SE* = standard error.

The results in Table 6.15 suggest that positive implicit attitudes toward L2 speakers (L2 Speakers ST-IAT) are associated with higher achievement. The underlying assumption of implicit attitudes is that they influence behavior without conscious awareness, and therefore their influence is non-self-reportable. If this is the case, implicit attitudes should still be able to predict achievement after controlling for the other explicit measures. Hierarchical linear regression was conducted as it would allow investigating the unique variance accounted for by implicit attitudes. This analysis was conducted on the full 9-point achievement measure. The results showed that implicit attitudes towards L2 speakers did predict achievement over and above all the other variables in this Study, $\beta = .19$, $SE = 0.39$, $t = 3.33$, $p = .001$.

RQ2: Are congruent learners more open to the L2 group?

The purpose of this part of the analysis was 1) to replicate the results from Study 1, showing that congruent learners are more open to the L2 community, and 2) to extend these results to L2 achievement. Following Study 1, a two-step procedure was applied (see Table 6.16). First, learners who obtained a score higher than the neutral zero in Attitudes toward L2 Speakers were selected for the analysis. This step satisfied the first column in Table 6.16 (i.e., positive explicit attitudes). Second, these learners were then divided based on a median-split of their L2 Speakers ST-IAT scores. This two-step procedure generated learners with positive–positive scores (i.e., congruent) and learners with positive–negative scores (i.e., incongruent). The same procedure was followed to obtain congruent and incongruent learners in terms of implicit attitudes toward the course. Just like Study 1, cluster analysis was also conducted to validate the results from this procedure.

Table 6.16: Illustration of (in)congruence between explicit and implicit attitudes.

Explicit Attitudes	Implicit Attitudes	Type
Positive	Positive	Congruent
Positive	Negative	Incongruent

A two-way MANCOVA was conducted to determine the effects of L2 Speakers Attitudes (congruent vs. incongruent) and L2 Course Attitudes (congruent vs. incongruent) on the dependent variables with Social Desirability as a covariate. As above, outlying values were removed, and no participant violated multivariate normality. The homogeneity of variance–covariance matrices was also assumed, Box’s $M = 33.39$, $F = 1.04$, $p = .40$. Using Pillai’s trace, there was a significant main effect of L2 Speakers Attitudes, $V = .048$, $F(4,$

231) = 2.91, $p = .022$, $\eta^2_p = .048$. As expected, there was neither an effect of L2 Course Attitudes, $V = .014$, $F = 0.80$, $p = .53$, $\eta^2_p = .014$; nor a significant interaction, $V = .017$, $F = 0.98$, $p = .422$, $\eta^2_p = .017$. There was also a significant main effect of Social Desirability, $V = .052$, $F = 3.19$, $p = .014$, $\eta^2_p = .052$. Only Religious Attitudes showed significant susceptibility to Social Desirability, $F = 8.39$, $p = .004$, $\eta^2_p = .035$.

The results are shown in Table 6.17. Just like Study 1, congruent learners scored less in all of Fear of Assimilation, Ethnocentrism, and Religious Attitudes, indicating more openness to the L2 group. Some p -values are slightly over the conventional .05 threshold, but it has been argued that it is not critical for replication research to satisfy an arbitrary threshold as long as the direction of the effect is maintained (e.g., Anderson & Maxwell, 2016; Nassaji, 2012).

Table 6.17: MANCOVA results for L2 Speakers Attitudes for congruent ($n = 112$) and incongruent learners ($n = 125$).

	Group	<i>EMM</i>	<i>SE</i>	<i>F</i>	<i>p</i>	η^2_p	<i>B</i>
Fear of Assimilation	Cong	0.09	0.166	5.31	.022	.022	182.63
	Incong	0.56	0.116				
Ethnocentrism	Cong	-0.80	0.203	3.51	.062	.015	12.85
	Incong	-0.33	0.141				
Religious Attitudes	Cong	0.97	0.149	3.19	.075	.013	31.68
	Incong	1.29	0.103				
Grades	Cong	5.04	0.345	5.46	.020	.023	2.75
	Incong	4.06	0.239				

Note. Repeating this analysis without the covariate leads to the same results, with the exception that Religious Attitudes drops to non-significance ($F = 2.15$, $p = .144$, $\eta^2_p = .009$). This indicates that the covariate has increased the estimation efficiency. *B* = Bayes factor, Cong = Congruent, *EMM* = estimated marginal mean, Incong = Incongruent, *SE* = standard error. Note also that Grades are used here as the full 9-point measure.

Still, that the direction of the effects in this Study are the same as those in Study 1 is only suggestive. A more systematic approach is to meta-analytically synthesize the results from the two Studies. One way to synthesize the results is to use the Bayes factor. The meta-analytic Bayes factor can be computed using the following formula (Rouder & Morey, 2011):

$$B = \frac{\int \prod_{m=1}^M Pr(t_m|\delta) f(\delta) d\delta}{\prod_{m=1}^M Pr(t_m|\delta = 0)} \quad (6.6)$$

where δ is the effect size, t_m the t -values from m studies, f the probability density function of the Cauchy (a distribution similar to the Normal), and \prod the product of terms. Although this formula looks complicated, it basically computes the likelihood of the observed effect sizes (from Studies 1 and 2) given a null effect size constrained to equal zero. Because the result is a likelihood, values over 1.0 indicate evidence in favor of the alternative hypothesis while values under 1.0 indicate evidence in favor of the null hypothesis. Calculation of the Bayes factor requires a prior belief about the size of the effect.

For this Study, the meta-analytic Bayes factor was computed using the BayesFactor R package (Morey & Rouder, 2015) using a 0.30 prior. This Bayes factor is computed via Gaussian quadrature, with posterior samples drawn via independent candidate Metropolis-Hastings (the full R code is available in Appendix D). The results, presented in the last column of Table 6.17, all exceed 1.0, thus lending support for the hypothesis that congruent learners are more open to the L2 group.

Still, the analysis above was based on a Cauchy prior of 0.30, which is equivalent to a standardized effect size (Cohen's d) of 0.30. Because there is an element of subjectivity in choosing the prior, sensitivity analysis was subsequently conducted using both a lower (0.10) and a higher (0.50) prior. The results are presented in Table 6.18. The results show that the Bayes factor is stable across the different priors and does not drop to 1.0.

Table 6.18: Sensitivity analysis of the stability of the Bayes factors (reported in Table 6.17) using three different priors.

	0.10 Prior	0.30 Prior	0.50 Prior
Fear of Assimilation	105.82	182.63	174.80
Ethnocentrism	9.96	12.85	10.90
Religious Attitudes	21.73	31.68	28.13
Grades	2.51	2.75	2.29

Tables 6.17 and 6.18 also show that congruent learners obtained significantly higher achievement, with the Bayes factor showing support for this hypothesis. The Bayes factor for Grades is the lowest, but this is not the meta-analytic Bayes factor (as in the other three analyses in Table 6.18) because Study 1 did not have a measure of achievement. Because

only one effect size was used here, this Bayes factor has lower power than the other three Bayes factors.

Finally, because the selection procedure used in the above analyses (cf. Table 6.16) might seem artificial, a two-step log-likelihood cluster analysis based on the four variables in Table 6.18 was conducted on the whole sample. The results readily yielded two clusters with a ratio of 1.03. A *t*-test showed that the cluster showing more explicit openness to the L2 group also scored significantly higher in the L2 Speakers ST-IAT, $t(270) = 2.34, p = .02, d = 0.28$. The meta-analytic Bayes factor, drawing from the male subsample of Study 1, also showed substantial support for the hypothesis and was stable across different priors, $B_{0.10} = 147.14, B_{0.30} = 234.60, B_{0.50} = 212.97$. The two clusters had equivalent scores on the L2 Course ST-IAT ($d = 0.001$). This demonstrates that only implicit attitudes toward L2 speakers, and not toward the L2 course, are relevant to the affiliation with L2 group. Because different results emerge from different implicit test, this pattern supports the validity of the scores derived from the implicit test. These results cannot be simply explained away either by cognitive confounds (such as working memory capacity or task-switching skills) or social confounds (such as taking the test seriously to please the teacher or to appear in a socially desirable manner).

Exploring the Religious Attitudes and Family Support scales

In Study 1, some analyses were conducted to explore the Religious Attitudes scale, which was newly developed for this thesis. This section continues that analysis in order to find out whether similar results would be obtained from a different sample studying the L2 in a foreign language context. This section then explores the Family Support scale.

Religious Attitudes. In Study 1, a *t*-test was conducted to compare those with high versus low self-reported religiosity (see Table 6.11). Table 6.19 performs the same analysis on the present sample. The results show that learners with low religiosity were also significantly lower in Fear of Assimilation and Ethnocentrism. This lends further support to the notion that the Religious Attitudes scale is closely related to intergroup relations. Learners with lower religiosity also achieved higher Grades. It is interesting that both Religious Attitudes and Ethnocentrism (see Table 6.15) predict success in language learning. This suggests that attachment to the L1 community can hamper openness to the L2 community. In other words, openness to the L2 community may not be enough at the presence of attachment to the L1 community.

Table 6.19: Differences between participants with low ($n = 153$) and high ($n = 129$) religiosity.

Scale	Religiosity	M	SD	t	d	B
Ideal L2 Self	Low	2.06	0.87	2.88*	0.35	1.05
	High	2.34	0.72			
Ought-to L2 Self	Low	1.99	0.80	2.13	0.30	1.11
	High	2.20	0.82			
Fear of Assimilation	Low	0.07	1.15	7.14***	0.85	4.16×10^{15}
	High	1.06	1.18			
Ethnocentrism	Low	-0.69	1.41	3.77**	0.44	1.55×10^{17}
	High	-0.07	1.39			
Attitudes to L2 Speakers	Low	1.19	0.79	2.01	0.23	0.43
	High	1.00	0.83			
L2 Learning Experience	Low	1.14	1.09	0.45	0.05	0.74
	High	1.20	1.14			
L2 Speaker ST-IAT	Low	0.27	0.35	0.05	0.00	2.00
	High	0.27	0.37			
L2 Course ST-IAT	Low	0.56	0.34	0.06	0.00	0.28
	High	0.56	0.33			
Family Support	Low	1.80	0.94	4.25***	0.50	581.38
	High	2.21	0.67			
Intended Effort	Low	1.67	0.90	1.69	0.20	0.91
	High	1.84	0.84			
Social Desirability	Low	13.71	3.68	1.13	0.14	0.47
	High	14.21	3.68			
Grades	Low	4.59	2.51	3.05*	0.36	13.65
	High	3.71	2.34			

Note. Bonferroni correction implemented.

* $p < .05$, *** $p = .001$

Table 6.20: Sensitivity analysis of the stability of the Bayes factors (reported in Table 6.19) using three different priors.

	0.10 Prior	0.30 Prior	0.50 Prior
Ideal L2 Self	1.51	1.05	0.73
Ought-to L2 Self	1.58	1.11	0.77
Fear of Assimilation	1.60×10^{15}	4.17×10^{15}	5.50×10^{15}
Ethnocentrism	5.87×10^{16}	1.55×10^{17}	2.08×10^{17}
Attitudes to L2 Speakers	0.78	0.43	0.28
L2 Learning Experience	1.16	0.74	0.50
L2 Speaker ST-IAT	2.48	2.00	1.44
L2 Course ST-IAT	0.57	0.28	0.18
Family Support	281.34	281.68	628.38
Intended Effort	1.19	0.91	0.67
Social Desirability	0.78	0.47	0.32
Grades	9.40	13.65	12.40

Since this part of the analysis is exploratory, the significance tests reported in Table 6.19 have been Bonferroni-adjusted. Without this adjustment, any *t*-value of 1.96 and above would have been significant at the .05 level. Thus, the results for the Ought-to L2 Self and Attitudes toward L2 Speakers would have been significant. However, whether such significant results would be genuine or just a Type I error is not clear. In order to investigate this, Table 6.19 also reports the Bayes factors meta-analyzing these results with those from Study 1 using a 0.30 prior (the full R code is available in Appendix D). The Bayes factor for Attitudes toward L2 Speakers is below 1.0, and so the evidence is against the hypothesis that there is any genuine difference between the two groups. The Bayes factor for the Ought-to L2 Self is above 1.0, but only just so. This raises the questions whether this results is robust. Table 6.20 reports a sensitivity analysis to examine the robustness of the Bayes factors with different priors. Indeed, the Ought-to L2 Self does drop below 1.0, showing that this result is not robust.

It is also rather unexpected that learners with *high* religiosity reported higher Ideal L2 Selves and Family Support. However, before attempting to interpret these results, it is important to establish their robustness first. Although the Ideal L2 Self has passed the Bonferroni correction and remained significant—and with a moderate effect size—combining the results from the two Studies leads to questioning the robustness this result. The sensitivity

analysis in Table 6.20 shows that the Bayes factors for the Ideal L2 Self drop below 1.0. Thus, caution must be exercised before claiming that learners with higher Religious Attitudes have higher Ideal L2 Selves. On the other hand, the Bayes factors for Family Support are large and stable. This leads to more confidence in this finding.

The same applies to Grades. The Bayes factors for Grades are relatively stable across priors. As for Fear of Assimilation and Ethnocentrism, the Bayes factors are extremely large. Tables 6.19 and 6.20 report the Bayes factors for these two scales in scientific notation because the values would be too large to report in the tables. Fear of Assimilation, for example, has a Bayes factor with 16 digits!

Note that the last five variables Table 6.20 were not included in Study 1, and so the Bayes factors reported here represent the likelihoods of these results only, rather than a meta-analysis. This leads to lower power, since the more studies are included the higher the power. Despite this, Grades and Family Support still obtained large and stable results.

Family Support. The above exploratory analyses, as well as RQ 1, examined the Family Support scale using *t*-tests. The results above have shown that Family Support is associated with lower Grades and higher Religious Attitudes. In order to examine these findings more closely, this final part of the analysis investigated the correlational patterns of Family Support with the other attitudinal and motivational variables. The results are shown in Table 6.21.

The first two columns of the table report the correlations of the variables with Family Support for low and high achievers, respectively. The last column tests whether the magnitude of the difference between each pair of correlation coefficients is statistically significant. These results show that low achievers tended to associate Family Support with their Ideal L2 Selves and their L2 Learning Experience more strongly than did high achievers. This suggests that low achievers are more susceptible to external influences. High achievers, on the other hand, probably developed their Ideal L2 Selves and enjoyed the learning situation regardless of whether there was pressure to do so. This implies a level of autonomy on the part of high achievers.

The pattern reverses, however, for L2 Speakers ST-IAT (i.e., implicit attitudes toward L2 speakers). High achievers' implicit attitudes were associated more strongly with Family Support than it is the case for their low-achieving counterparts. Family Support for high achievers is reflected on implicit, not explicit, attitudes. This might imply that Family Support for high achievers goes 'deeper' and reaches implicit attitudes, rather than remaining

at a more ‘superficial’ level. Still, because these are exploratory analyses, it is imperative for future research to validate them before any firm conclusions can be made.

Table 6.21: Correlation of motivational scales with Family Support for low ($n = 134$) and high achievers ($n = 140$).

Scale	r_{Low}	r_{High}	z
Ideal L2 Self	.43***	.14†	2.62**
L2 Learning Experience	.31***	.11	1.75†
Intended Effort	.24**	.15†	0.75
Ought-to L2 Self	.20*	.15†	0.45
Attitudes to L2 Speakers	.10	.05	0.40
L2 Speakers ST-IAT	.05	.28***	1.92†

Note. All hypotheses two-tailed.

*** $p \leq .001$, ** $p \leq .01$; † $p < .10$.

6.3.3 Discussion

Study 2 has reported the first investigation in the L2 field examined language achievement in the context of implicit attitudes, and the results show that implicit attitudes toward L2 speakers successfully predict L2 achievement. This prediction involved explaining unique variance of L2 achievement, over and above that explained by the other explicit variables, thus indicating that this relationship is not mediated by any of these explicit variables. This pattern supports the unconscious nature of the scores derived from the implicit test.

Study 2 also replicated the results of Study 1, showing that explicit–implicit congruence is associated with more openness to the L2 community. That this effect was present only for implicit attitudes toward L2 speakers, rather than toward the L2 course, indicates that these results were not mere artifacts of the learner’s cognitive skill or interest in the test, thus lending support to the implicit attitudes construct.

More concretely, Study 2 has attempted to answer two research questions. The first concerned comparing the motivational profiles of high and low achievers, and the second investigated the replicability of Study 1 results. The results of the first research question showed that implicit attitudes toward L2 speakers were a positive predictor of L2 achievement. This is in line with the long-held view that learning an L2 successfully is facilitated by a positive disposition toward the speakers of the target language. However, it

was implicit, not explicit, attitudes that predicted L2 achievement. The fact that explicit attitudes did not show any predictive validity should not be surprising. For example, Gardner (1985, 2010) places integrativeness farther away from achievement, mediated by motivation. Integrativeness is seen as a supporting factor of motivation, rather than a direct predictor of achievement. On the other hand, implicit attitudes toward L2 speakers did predict achievement directly, and did so over and above the other explicit variables. This suggests that, when it comes to attitudes toward L2 speakers, implicit attitudes may be more powerful than explicit attitudes.

The second variable that predicted L2 achievement was explicit attitudes toward the L2 course. In fact, this variable had the largest effect size. Indeed, the classroom is the primary contact between the learner and the educational content, and this contact is sustained throughout the academic year. It is therefore reasonable that success in L2 learning is associated with favorable attitudes toward the L2 course. Note however that attitudes toward the L2 course were operationalized here using a semantic differential scale. This was not an intentional deviation from the standard approach in the field. A semantic differential scale was used only for the purpose of having an explicit scale that is parallel to the implicit test. That is, the same bipolar adjectives were used to measure explicit and implicit attitudes toward the L2 course. Indeed, semantic differential scales do have some interesting properties. A study by Friberg, Martinussen, and Rosenvinge (2006) provides interesting insights in this context. Friberg et al. compared the psychometric properties of two versions a resilience scale, one Likert-based and the other semantic differential-based. Their sample was also university students, thus making it comparable to the sample in this thesis. Their results showed that the semantic differential-based version exhibited superior psychometric properties. The factor structure of the semantic differential scale outperformed the Likert scale in terms model fit and unidimensionality. The researchers explain their results by arguing that Likert scales raise the risk of acquaintance bias, while semantic differential scales increase complexity and the cognitive load required from individuals responding to the questionnaire items. The next chapter addresses this scale in more detail and reinterprets its results in light of unconscious motivation.

A negative predictor of L2 achievement turned out to be parental support (for similar results, see Lamb, 2012, Table 9). It seems rather counterintuitive that parental support is associated with lower achievement. A likely explanation is that when parents see their children struggling in school, they start offering them more support. From this perspective, underachievement becomes the causal factor in this relationship. Another interesting insight

emerged from the correlational patterns of family support with the other motivational variables. Namely, low achievers had stronger correlations between family support and each of the ideal L2 self and the L2 learning experience. That high achievers did not exhibit this pattern might suggest that they had dissociated these two factors from parental influence. They for example enjoyed learning regardless of whether their parents proactively encouraged them to do so. These explanations are speculative, and further research should investigate them more closely.

Another negative predictor of L2 achievement was the ought-to L2 self. This variable has not shown consistent results in previous research (e.g., Dörnyei & Chan, 2013; You et al., 2016). This might be explained by the fact that the ought-to L2 self represents an external image that it not fully internalized by the learner. Learning a foreign language is a long-term enterprise that requires a substantial amount of investment. An external factor may not be sufficient to support successful learning. That is, “while [ought-to selves] do play a role in shaping the learners’ motivational mindset, in many language contexts they lack the energising force to make a difference in actual motivated learner behaviours by themselves” (Dörnyei & Chan, 2013, p. 454).

The intended effort scale demonstrated susceptibility to social desirability. This suggests a potential limitation in this variable. Social desirability indicates that the individuals inflate their responses in order to present themselves in a favorable light. Individuals who score higher in the social desirability scale tend to also score higher in the intended effort scale. This might be because intended effort reflect an intention to conform to social norms. The items reflect intentions that are admired by the society, such as “I am prepared to expend a lot of effort in learning English.” It seems that individuals high in social desirability tend to be influenced by social pressures in their responses, rather than simply reporting their own feelings and impressions. Therefore, researchers may need to control for social desirability before being able to interpret responses to this scale.

The two implicit tests yielded different patterns of the results, thus the content of the two tests made a difference. Scores from the implicit test concerned with L2 speakers showed an associated with explicit attitudes toward L2 speakers, but scores from the other implicit test—concerned with the L2 course—did not. This lends support to the convergent and discriminant validity of the implicit test. That is, explicit and implicit scores converged when they were related to L2 speakers (convergent validity), and diverged when one was related to L2 speakers and the other to the L2 course (discriminant validity).

An interesting finding is that the implicit test related to the L2 course did not exhibit any associations, even with explicit attitudes toward the L2 course. This suggests that explicit attitudes may not always have implicit counterparts in every domain. Implicit attitudes are thought to develop through exposure from the milieu. That is, when the individual is exposed to messages from others (even if these messages are subtle and indirect), one would develop implicit attitudes. This happens even if one declares the opposite attitude explicitly. It is possible that the L2 course may not receive consistent messages, positive or negative, in the context of this Study.

Another possible interpretation is that the 'L2 course' is an abstract entity that does not warrant the development of implicit attitudes. Implicit attitudes might tend to develop in rather sensitive areas. In the seminal paper introducing the Implicit Association Test, Greenwald et al. (1998) state that the potential value of the test is in measuring "significant automatic associations" (p. 1465). In a similar vein, in their review of the Implicit Association Test, Nosek et al. (2007) explain that the test has the "potential for revealing disquieting aspects about human minds" (p. 286). Therefore, implicit attitudes might be more salient in socially sensitive domains.

Finally, the research presented in this thesis has demonstrated the importance of replicating research results and then systematically meta-analyzing them. It also has shown the importance of conducting sensitivity analysis in order to examine the robustness of the results. For example, the results in this thesis show that the relationship between explicit-implicit congruence and openness to the L2 group is robust and holds in more than one context. On the other hand, the results from Study 2 first suggested that higher ideal L2 self is associated with higher religiosity, which was rather unexpected. However, the sensitivity analysis showed that this finding is not robust enough, and so it should not be over-interpreted. Admittedly, our field has not shown keen interest in systematically replicating and meta-analyzing findings, probably because this requires somewhat advanced knowledge of statistical analysis. However, this is an essential step that we need to take for the sake of developing a cumulative science.

Chapter 7: General Discussion and Conclusion

A true test of any theoretical formulation is not only its ability to explain and account for phenomena which have been demonstrated, but also its ability to provide suggestions for further investigations, to raise new questions, to promote further developments and open new horizons
—Gardner (1985, p. 166)

7.1 Introduction

Chapter 6 has presented two studies testing a series of research questions related to language learning motivation in light of unconscious motivation. The aim of this chapter is to summarize the main results of this thesis and attempt to link them to existing language motivation theory and findings. The discussion is organized based on the four main components of the L2 MSS: the ideal L2 self, the ought-to L2 self, the L2 learning experience, and intended effort. After that, the discussion moves to highlight the implications of the present thesis to the role of attachment to the L1 community. Finally, some limitations and possible future directions are highlighted.

7.2 Summary of findings and general discussion

The overall goal of the research presented in this thesis has been to gain a better understanding of the role of implicit attitudes in language learning and motivation. This research was conducted to investigate various aspects related to implicit attitudes, while recruiting a fairly large sample. Study 1 investigated a number of research questions, and then Study 2 successfully replicated some of the results and extended them. Study 2 also involved additional controls, including social desirability as an explicit control and a second implicit test as an implicit control.

While conventional language motivation theories tend to paint a one-dimensional picture according to which learners vary along one (conscious) dimension, the results in this thesis point to the possibility of classifying learners along two dimensions: conscious and unconscious. As reviewed in Chapter 3, most motivational theories are not, in principle, opposed to an unconscious facet of motivation. Instead, the reason behind the predominance

of self-report measures such as questionnaires and interviews mostly has to do with the paucity of instruments that could easily tap into unconscious phenomena.

The present research has used two tests of implicit attitudes, the Implicit Association Test (Greenwald et al., 1998) and the Single-Target Implicit Association Test (Wigboldus et al., 2004). Despite the ambiguity of the scores derived from the Implicit Association Test (cf. Chapter 5), the results from the two tests are very similar. In fact, the Single-Target Implicit Association Test seems weaker. That is, although the two Studies had equivalent sample sizes, the Single-Target Implicit Association Test was only marginally significant (see Table 6.17), suggesting that the Implicit Association Test might be more sensitive. In any case, these results are encouraging, in that convenient and easy-to-use instruments seem to offer insights into aspects of learners' attitudes that explicit self-report may not easily capture. These implicit tests require only around five minutes of a button pressing exercise that most research participants find enjoyable and entertaining, more like a 'game' than a 'test'.

At the same time, it has to be emphasized that such implicit measures are not intended to be a replacement of self-report measures. As reviewed in Chapter 2, most scholars still give agency to conscious thought. According to these scholars, studying human motivation is somewhat analogous to the job of a doctor evaluating a patient's health. It would be unreasonable for the doctor to either rely solely on the patient's conscious self-report about her health, or to disregard it completely. Doctors normally need to complement self-reports with additional checks using specialized instruments (Bar-Anan & Nosek, 2009). Thus, a more moderate perspective would encourage researchers to draw from unconscious motivation in order to assess "individual difference dimensions for which self-report measures are insensitive" (Greenwald & Nosek, 2001, p. 91). The following sections discuss the main implications of the findings in more detail.

7.2.1 The ideal L2 self

The results of this thesis show that the ideal L2 self could not predict L2 achievement. In the context of intended effort, previous empirical research has supported the predictive validity of the ideal L2 self, with the results being "straightforward" (Dörnyei & Ushioda, 2011, p. 87), and providing "solid confirmation" (Dörnyei, 2009b, p. 31) in that "the emerging picture consistently supports [its] validity" (Dörnyei, 2014b, p. 521).

On the other hand, in line with the results of this thesis, the predictive validity of the ideal L2 self in the context of actual achievement has been less conclusive. A number of studies have also found null results when they examined the relationship between the ideal L2

self and actual achievement or performance. For example, Kim and Kim (2011) have investigated the motivation of Korean secondary school students and found that the ideal L2 self could not predict school grades. The researchers note that “being motivated by developing a vivid ideal L2 self through a dominant visual preference seems to be irrelevant to the level of academic achievement” (p. 36). Similarly, Lamb (2012) used a C-test as a measure of L2 proficiency and found that the ideal L2 self could not predict achievement in any of his three groups. MacIntyre and Serroul (2015) also tested the relationship of the ideal L2 self and actual L2 performance in their idiodynamic paradigm, which examines individual motivational variability on a per-second timescale. In line with the findings of this thesis, MacIntyre and Serroul (2015) found “no evidence” (p. 126) that the ideal L2 self is associated with idiodynamic ratings. In one study (Moskovsky, Assulaimani, Racheva, & Harkins, 2016), the ideal L2 self was a *negative* predictor of language achievement. The researchers argue that, overall, the results “at best indicate a tenuous link between the self guides and achievement” (Moskovsky et al., 2016, p. 650).

At first sight, these results might seem to suggest that the ideal L2 self has failed to explain language achievement. However, a more likely explanation of these mixed results has to do with how the ideal L2 self is currently operationalized. That is, the most common method of operationalizing the ideal L2 self currently is to use Likert statements in the order of ‘I can imagine myself...’. However, this approach does not do justice to the complexity of the ideal L2 self. Since it was initially introduced, the ideal L2 self has come with a set of conditions that need to be satisfied in order for it to be effective (Dörnyei, 2009b). These conditions include perceived desirability, accessibility, plausibility, and present–future discrepancy, harmony with the ought-to self, and being offset by a feared L2 self. Without satisfying these conditions, the ideal L2 self has never been expected to be effective in the first place (cf. Henry & Cliffordson, 2015; Hessel, 2015). The above empirical studies have not involved additional measures to ensure that these conditions are satisfied. Thus, although the results have so far been inconclusive, they should not be seen as detracting from the potential contribution the ideal L2 self can make to our understanding of L2 motivation.

7.2.2 *The ought-to L2 self*

The results of this thesis show that the ought-to L2 self is a negative predictor of L2 achievement. This finding is in line with previous research showing that the ought-to L2 self yields inconsistent results (see Dörnyei & Chan, 2013; You et al., 2016). One possible explanation is that the ought-to self, by definition, is concerned with meeting the expectations

of *others*. Therefore, they represent “someone else’s vision for the individual” (Dörnyei, 2009b, p. 14), and so “ought self-guides function more like minimal goals” (Higgins, 1998, p. 5). Consequently, “while [ought-to selves] do play a role in shaping the learners’ motivational mindset, in many language contexts they lack the energising force to make a difference in actual motivated learner behaviours by themselves” (Dörnyei & Chan, 2013, p. 454). Dörnyei and Chan (2013) go on to explain that “while the participants perceived the external pressures on them as being valid and did *intend* to adjust their behavior accordingly, this intended effort was not manifested in their actual grades” (p. 454, original emphasis). In line with the suggestion that it concerns minimal goals, the ought-to L2 self has been shown to be associated with the less internalized, preventive forms of motivation (see Dörnyei & Ushioda, 2011, p. 86; Taguchi et al., 2009). As the name suggests, minimal goals are those that the learner wants to achieve only minimally rather than thoroughly. Unsurprisingly, such minimal goals are less likely to sustain engagement in learning and enthusiasm in the long run.

One possible way to address this limitation of the ought-to L2 self is by expanding its scope. That is, rather than conceptualizing the ought-to self as a monolithic construct concerned primarily with minimal goals, it might be conceptualized along a continuum of internalization (cf. Lanvers, 2016). Some motivational theories posit external influences with different gradation. For example, in Self-Determination Theory (Deci & Ryan, 2002), extrinsic motivation falls along four degrees of internalization. The least internalized (called external regulation) concerns engaging in an activity simply to obtain a certain reward or avoid punishment. Beyond that, external influences in Self-Determination Theory may be perceived as valuable to significant others and so they acquire self-esteem implication (introjected regulation), may facilitate attainment of other self-defining values (identified regulation), or may be perceived as consistent with one’s sense of self and its values (integrated regulation). There is some evidence that the more internalized forms of extrinsic motivation are associated positively with L2 achievement, while the less internalized forms are associated negatively with it (e.g., Wang, 2008). In fact, the more internalized forms of extrinsic motivation have been found to outperform even intrinsic motivation in predicting educational outcomes (e.g., Joe, Hiver, & Al-Hoorie, 2017; Noels, 2009). In contrast, since the ought-to L2 self is conceptualized as an external force that is not internalized, it functions more like an “imported image” (Dörnyei & Ryan, 2015, p. 88) reflecting “social pressures coming from the learner’s environment” (Dörnyei, 2014a, p. 8) to perform “the duties and obligations *imposed* by friends, parents and other authoritative figures” (Dörnyei, 2009b, p.

32, emphasis added). It is therefore not surprising that it exhibits a negative association with L2 achievement. Indeed, Mackay (2014, p. 394) reports that some of her participants construed external pressures to learn the language as a *demotivating* factor.

In the context of languages other than English (LOTEs), it is highly conceivable that a less homogeneous ought-to L2 self is in operation (see Dörnyei & Al-Hoorie, in press). This is because learning a LOTE does not usually receive as much societal and institutional support as does learning English. Some languages receive support, others receive indifference, and yet others might even receive opposition and active discouragement. This suggests an inter-language heterogeneity in the ought-to L2 self. In fact, even in the context of learning a global language like English, it is also conceivable that the ought-to L2 self is not homogenous. In a study by Dörnyei and Chan (2013), factor analysis uncovered two, rather than just one, dimensions underlying the ought-to L2 self. The researchers therefore concluded that, “in light of the ambiguities that have surfaced with regard to the ought-to self, it would have been better to apply more elaborate scales targeting different types of external pressures separately... instead of using a single ought-to self scale” (p. 456).

Still, an important consideration in broadening the scope of the ought-to L2 self is that it would constitute an explicit departure from Higgins’s original conceptualization of ought self-guides as only ‘minimal’ goals. This departure is not a problem per se, but it should be debated whether this gradation should be still treated as part of the ought-to L2 self or the ideal L2 self. After all, if it is internalized to some extent, why is it still an *ought*? Many ‘ideals’ have also originated from socialization process and then internalized. This may lead to an arbitrary distinction between ideal and ought-to L2 selves.

Furthermore, describing a construct as an ought, despite it being internalized to some extent, raises the risk of downplaying its potential in the research community. Although this might appear as a mere semantic issue, Brophy (2009) argues that Self-Determination Theory has suffered from “lingering constraints” (p. 151), in that too much focus has been paid to intrinsic motivation at the expense of the highly self-determined forms of ‘extrinsic’ motivation. As mentioned above, it does not help that empirical evidence shows that the latter can be a better predictor of educational outcomes than intrinsic motivation (e.g., Joe et al., 2017; Noels, 2009).

Some L2 scholars still argue that this gradation should be part of the ought-to L2 self. In Taylor’s (2013) words,

The [L2 MSS] model also dismisses much of the influence of the ought-to self on the individual's motivation and self development. In Dörnyei's view (2009: 32), "because the source of the second component of the system, the Ought-to L2 Self, is external to the learner... this future self-guide does not lend itself to obvious motivational practices." This is contrary both to a considerable body of literature showing that socially induced possible selves can enhance school persistence and academic achievement... and to the experience of all of us who have ever done anything because we felt we should, rather than because we really wanted to. (Taylor, 2013, p. 32)

In this quote, Taylor refers to the fact that the ought-to L2 self has yielded few classroom applications. However, there is at least one aspect that might have practical implications, namely a lack of discrepancy between the ideal and ought-to selves. This is what Hadfield and Dörnyei (2013) describe as "aligning the future selves" (p. 8). This unification can be achieved by trying to bring together these two self-guides so that they function in harmony.

In line with the results of this thesis, it might be possible to postulate a further condition for the effectiveness of self-guides, namely a lack of discrepancy between the explicit and implicit dimensions of these self-guides. According to the results of this thesis, explicit-implicit congruence was associated with more openness to the L2 community. In a similar vein, it is conceivable that a positive ideal or ought-to disposition might be undermined when the implicit disposition is less positive. Success in long-term pursuits is facilitated by explicit-implicit congruence because the individual can harness both (explicit) proactive organization of goals, as well as (implicit) spontaneous inclination to keep pursuing these goals (Thrash et al., 2010).

7.2.3 Intended effort

This scale and its variations (e.g., motivated behavior) have been used extensively recently as a primary criterion measure in validating the L2 MSS. In fact, the original argument in favor of the L2 MSS equates self-reported intended effort with the criterion measure: "The Ideal L2 Self was consistently found to correlate highly with the criterion measure (Intended effort), explaining 42% of the variance" (Dörnyei, 2009b, p. 31). However, little attention has been paid to validity of this scale in the first place, which is obviously an equally important issue. In the present research, intended effort has emerged as a poor predictor of actual achievement ($r = .00$, see Table 6.11). There are a number of possible explanations for this outcome.

One possibility is that self-report rating, by nature, is a crude estimate that is incapable of eliciting precise responses. This explanation is reminiscent of an early study by McClelland and Atkinson (1948), who compared the self-reported hunger of participants who had abstained from eating for one hour, four hours, or 16 hours. Although the last condition would certainly lead to the most hunger, the researchers found that self-reported hunger could not distinguish it from the four-hour condition (though their implicit test did), and thus self-ratings provided “a less sensitive index” (McClelland, 1987, p. 188). It seems that standard self-report measures are unable to capture subtleties beyond a certain threshold (e.g., learners with high vs. very high intended effort), and so most respondents tend to simply mark ‘Strongly Agree’ on the questionnaire. More recently, Zogmaister, Perugini, and Richetin (2016) obtained similar results for both hunger and thirst using the Implicit Association Test, with implicit scores showing more sensitivity to motivational states. Other studies also found this effect in relation to smoking (S. J. Sherman, Rose, Koch, Presson, & Chassin, 2003) and unfinished goal pursuit (Ferguson & Bargh, 2004). In reviewing research that has compared self-reports with objective measures of actual behavior, Back and Vazire (2012) report low to moderate correlations and conclude that “there are substantial blind spots in personality self-views when it comes to predicting actual behavior” (pp. 138–139).

Another possible reason for the poor predictive validity of intended effort is simpler. Common sense suggests that intended effort should not function as a consistent and reliable predictor of achievement in classroom settings. For example, it is possible that some learners will express lower levels of intended effort *because* they believe they would obtain higher grades (e.g., confidence in one’s ability to pass the test of a particular course). On the other hand, some low achievers might express higher intended effort *because* they realize they are in danger of failing, thus trying to do too much too late. The dynamics of academic achievement thus seem very different from the dynamics of general ‘L2 proficiency’, and in some circumstances it seems naïve to expect a straightforward link between intended effort and academic achievement. A similar view has been expressed by Gardner (2007), who argues that there are two distinct types of motivation. The first type is *language learning motivation*, and it concerns a general interest in learning the L2 and is relatively stable over time. The other type is *classroom learning motivation*, which is highly influenced by various factors, such as the teacher, the course content, and the class atmosphere (see also Moskovsky et al., 2016, p. 651, for a similar view). Because classroom motivation is dynamic and changing all the time, using a one-off intended effort scale is unlikely to do justice to it.

Finally, intended effort also showed a high level of susceptibility to social desirability. Self-report measures vary in the extent to which they are susceptible to social desirability (Chan, 2009), and intended effort turned out to be the most highly susceptible scale to it. This is in line with findings reported earlier by Gardner and Glikzman (1982) in relation to ‘motivational intensity’ in the Attitude/Motivation Test Battery. Adding a control like social desirability to the statistical model serves to increase the efficiency of the estimate (Rutherford, 2000, p. 105) by reducing standard errors without a substantial change in effect size. While this procedure was effective in the case of the religious attitudes scale, it did not help intended effort. This adds to its problematic nature.

Finally, it is not uncommon for people to make serious ‘intentions’ but then never actually act upon them. A good example is New Year’s resolutions. Every year, people make resolutions for the new year, but few follow them through. According to research by the University of Scranton, only 8% of people are successful in achieving their New Year’s resolutions (Statistic Brain, 2016). It is therefore easier said than done, as the saying goes.

7.2.4 The L2 learning experience

This thesis found that the L2 learning experience to be the strongest predictor of achievement. Some previous research has also shown that the learning situation is the best predictor of L2 achievement (e.g., Lamb, 2012), as well as being one of the most dynamic constructs in L2 motivation (e.g., MacIntyre & Serroul, 2015). However, rather than celebrating these positive results, this section evaluates them critically and concludes that their interpretation is not as straightforward as it might seem.

Although the role of the learning context has been recognized for decades (e.g., Gardner, 1979), it is unfortunate that this is probably the least theorized aspect in L2 motivation theory. For example, Dörnyei (2009b) has described the L2 learning experience as the “situated, ‘executive’ motives” (p. 29) and “the causal dimension” (Dörnyei, 2005, p. 106). However, little work has been done since then to clarify the role of such executive motives and the mechanisms underlying their causal effect. In contrast to this, Gardner has repeatedly expressed skepticism about any direct effect the learning situation might have. For example, Gardner (2007) presented the results of two studies on language learners from Catalonia showing that the relationship between attitudes toward the learning situation and achievement is either small or non-significant. Commenting on these weak results, Gardner states,

one would expect that in cooperative classes with an experienced and skilled teacher and good teaching materials, etc., that students would have more favourable attitudes toward the situation and thus would learn more English and thus get higher grades. One could hypothesize any number of reasons for this result, but the simple truth is that we obtain similar [weak] results in many of our studies, some of which use grades as the measure of language proficiency while some use other indices of achievement as well. (Gardner, 2007, p. 17)

Elsewhere, Gardner has elaborated on the relationship between the learning situation and achievement, explaining that the relationship is not direct but mediated by motivation. In Gardner's words,

integrativeness and attitudes toward the learning situation are seen as supports for motivation, but it is motivation that is responsible for achievement in the second language. Someone may demonstrate high levels of integrativeness and/or very positive attitudes toward the learning situation, but if these are not linked with motivation to learn the language, they will not be particularly highly related to achievement. (Gardner, 2010, p. 91)

Indeed, this seems like a reasonable view. However, two issues can be raised here. First, is this relationship mediated by *conscious* motivation only? And second, is this relationship causal?

Regarding the first point, there seems to be no reason to limit the mediation to conscious motivation. In line with this possibility, the results in this thesis show that the effect of the L2 learning experience was not mediated by intended effort, a scale that is comparable to the motivated behavior scale in Gardner's framework. This leads to the speculation that more 'unintended' mediators might also be playing a role, such as increased cognitive attention during enjoyable learning lessons. Such unintended motivated behavior triggered by particular situational cues may be too subtle to be detectable and self-reportable. In fact, according to Bargh and colleagues,

one important reason for the observed power of the situation in determining behavior is that the mere, passive perception of environmental events directly triggers higher mental processes in the absence of any involvement by conscious, intentional

processes... In other words, much of the power of situational and contextual stimuli comes from the direct, automatic, and unconscious effect they have over social behavior, an effect relatively independent from that of their dual-process partner, conscious processes. (Bargh et al., 2010, p. 288)

From this perspective, learning motivation may be unconsciously activated by the mere presence of motivationally-charged stimuli in the environment that are not even ‘noticed’ by learners. A number of studies have lent support to this possibility. For example, Stajkovic, Locke, and Blair (2006) conducted two experiments and found that ‘assigned conscious goals’ and ‘primed unconscious goals’ both enhanced task performance. Interestingly, the researchers also found an interaction between the two goals, in that when both conscious and unconscious goals were activated at the same time, unconscious goals improved the performance to achieve the conscious goals. Again, this points to the facilitative property of explicit–implicit congruence. In another study, Radel et al. (2013) exposed their participants to a ‘barely audible’ conversation (i.e., just above the auditory threshold) to which the participants could not have attended because they were engaged in a cognitively demanding task. When this conversation was about an intrinsically motivating activity reflecting enjoyment and satisfaction, the participants’ motivation was automatically activated so that they consistently outperformed their control counterparts both in solvable tasks and in perseverance in unsolvable ones. The authors argue that studies successfully eliciting unconscious motivation through situational cues have yielded “indisputable evidence” (Radel et al., 2013, p. 763). These findings support the view that unconscious motivation can mediate the relationship between aspects of the learning situation and learning.

Regarding the second question, whether the relationship is causal, this has simply been taken for granted in the field. For example, structural equation modeling studies posit a causal relationship (represented by an arrow from the learning situation to the outcome variables). Whether the results show that this relationship is strong or weak, is it causal in the first place? Many experienced teachers would probably tell you that enjoyment of the course and learning from it are two different things. If anything, the relationship can sometimes be *negative*, especially in cases where effective learning requires sweat and tears. Many experienced teachers would also downplay the value of end-of-course ‘student satisfaction surveys’ administered at many institutions around the world (such student satisfaction surveys are comparable to ‘attitudes toward the learning situation’ used in motivation

research). Are the students the best judges of teaching and of course effectiveness? Put differently, if the student enjoys the course and then expresses positive attitudes toward the learning situation (whether in course evaluation forms or in motivation research questionnaires), can we conclude that s/he has actually learned from the course?

Research shows the answer to this question is in the negative. A number of experimental studies conducted in different contexts around the world—including Italy (Braga, Paccagnella, & Pellizzari, 2014), France (Boring, 2015), and the United States (J. Arbuckle & Williams, 2003; Carrell & West, 2010; MacNell, Driscoll, & Hunt, 2015)—have demonstrated that student satisfaction with the course is biased (based on objective measures) and is *negatively* correlated with success in subsequent, more advanced courses. In other words, students who report enjoying the learning situation more are the ones who have probably learned less from it!

It is indeed a conundrum that the results from experimental research show a negative relationship between the learning situation and actual learning, while the results from studies in our field (which are typically observational, including this thesis) show a positive relationship. For example, a meta-analysis by Masgoret and Gardner (2003) that involved 75 studies and 10,489 participants in total shows the correlation between attitudes toward the learning situation and grades is $r = .24$, which is equivalent to $d = .49$. This is a positive relationship with a magnitude approaching moderate. Now, if student rating of the course has little to do with learning from it, how do we explain this positive relationship?

When results from experimental and observational studies are in conflict, priority goes with experimental studies. Since the vast majority of studies in our field (again, including this thesis) are observational, there is always the risk of confounds. Beleche and colleagues point out the need for caution in interpreting observations studies:

The positive association between grades and course evaluations may also reflect initial student ability and preferences, instructor grading leniency, or even a favorable meeting time, all of which may translate into higher grades and greater student satisfaction with the course, but not necessarily to greater learning. (Beleche, Fairris, & Marks, 2012, p. 709)

When Beleche et al. (2012) controlled for these confounds, they found that the relationship of course evaluation with achievement in that course was very small in magnitude ($\beta_s = .054$ – $.065$) and was nonsignificant with achievement in the subsequent course. These findings led

the researchers to the recommendation that “it may be prudent for institutions wishing to capture the extent of knowledge transmission in the classroom to explore measures beyond student course evaluations” (p. 718).

This should be sobering. Could it be that the positive results we have obtained over the past decades represent such confounds rather than a genuine relationship between course evaluation and actual learning? Inasmuch as these studies were observational and did not control for these confounds, this possibility cannot be ruled out. To make things even worse, Beleche et al. (2012) did not control for all potential confounds biasing course evaluations. Other potential confounds include the student’s grade expectations, and the teacher’s gender, ethnicity, age, and even clothes and attractiveness (for reviews, see Marsh & Roche, 1997; Ottoboni, Boring, & Stark, 2016; Stark & Freishtat, 2014). As an illustration of the extent of confound in student evaluation, the vice dean of Rutgers University School of Law recently sent a mass email to students asking them not to comment on the attire of female professors in teacher evaluation forms (Flaherty, 2015). However, is simply ‘telling’ the students to be objective going to make student evaluations objective? (If this is the case, then we as researchers can also do it.) Results by Ambady and Rosenthal (1993) show that students form impressions about their teachers after watching a very brief silent video (less than 30 seconds), and that these first impressions then predict end-of-course evaluations. Thus, it seems individuals simply cannot help forming these attitudes automatically, even if they do not intend to. Because of these confounds, it seems impractical for an observational study to control for all these potential biases. This is why Ottoboni et al. consider student evaluation to be biased beyond adjustment:

Given the many sources of bias in SET [student evaluations of teaching] and the variability in magnitude of the bias by topic, item, student gender, and so on, as a practical matter it is impossible to adjust for biases to make SET a valid, useful measure of teaching effectiveness. (Ottoboni et al., 2016, p. 10)

These results are disconcerting. They raise doubts about a motivational component that language motivation theories have included for decades. This component is originally found in Gardner’s (1985, 2010) Integrative Motive under the title attitudes toward the learning situation, which is comprised of evaluation of the teacher and evaluation of the course. These are posited to have a causal effect in the model (e.g., Gardner, 2000). Since then, this component has appeared in different theories under various guises (e.g., Dörnyei,

2005, 2009b; Noels, 2001; Ushioda, 2001). In all these theories, the association between the learning situation and language learning is considered causal.

However, it is not an unusual experience for the learner to get the ‘impression’ that they have learned the subject well, but to subsequently discover that there were gaps in their knowledge that they were not aware of. This misleading impression of mastery can happen for many reasons, including a teacher with a charismatic personality and an entertaining approach.

Evidence of this misleading impression has been demonstrated graphically in a classic experiment titled ‘The Doctor Fox Lecture: A paradigm of educational seduction’ (Naftulin, Ware, & Donnelly, 1973). Naftulin et al. invited a professional actor to give a lecture about Game Theory (which he knew nothing about). The actor was given a fake name, Dr. Myron L. Fox, and was introduced to the unsuspecting audience as an expert in the application of mathematics to human behavior. The actor’s lecture involved meaningless, conflicting, and irrelevant information, but he exhibited a charismatic personality and sounded authoritative while peppering his speech with some humor. Despite the empty content of the lecture, the results showed that the audience rated him significantly favorably in that they reported having enjoyed the lecture and even learned from it. (In fact, one person even reported that s/he had read the speaker’s publications!) Despite these favorable ratings, we can state with confidence that no knowledge transmission or learning whatsoever happened in that situation. ‘Dr. Fox’ simply did not know the material in the first place. The feeling of having learned from the lecture is little more than a misattribution. The audience enjoyed the lecture and then misattributed this feeling to the informativeness of the lecture, while in fact it may have been simply the charismatic and authoritative personality of lecturer that led to this feeling. Naftulin et al. (1973) conclude that “student satisfaction with learning may represent little more than the illusion of having learned” (p. 630). This is now known as the Dr. Fox effect¹⁰.

The evidence questioning to validity of learners’ attitudes toward the learning situation ties in well with the running theme of this thesis concerning the vulnerability of reliance on self-report to all sorts of biases. This is therefore another argument against the overreliance on self-reports, even if the results are consistently positive. Hence, the findings of this thesis in relation to attitudes toward the learning situation should be interpreted with

¹⁰ In the original experiment, Naftulin et al. videotaped the lecture by ‘Dr. Fox’. Some of its footage is now available on YouTube: www.youtube.com/watch?v=RcxW6nrWwtc.

extreme caution, especially when it comes to making causal claims. This issue is discussed further in the limitations section below.

7.2.5 Attachment to the L1 community

One of the first concepts introduced in the language motivation field was the idea of integrative motivation (Gardner, 1979, 1985, 2010). According to this concept, L2 learning is different from other school subjects in that it is social in nature, and that it is facilitated by one's openness to adopt features of the target language community. That is, integrativeness "reflects a genuine interest in learning the second language in order to come closer to the other language community" (Gardner, 2001a, p. 5). In recent years, integrative motivation has largely fallen out of favor since Global English is no longer associated any specific Anglophone community. From the perspective of Global English, also, some integrative and instrumental orientations have become hardly distinguishable (Lamb, 2004). For these reasons, the general flavor of the field has shifted from integrative motivation to identification with "a non-specific global community of English language users" (Ushioda & Dörnyei, 2009, p. 3). This is one of the basic assumptions of the L2 MSS.

Both of these models are therefore in agreement that some level of openness to the L2 community (according to the integrative motive) or to L2 speakers in general (the ideal L2 self) is important for successful learning. The results of this thesis do not dispute this idea. They suggest that it may not be enough to focus on openness to the L2 community without also considering the other side of the coin, namely attachment to the L1 community. In other words, it is likely that there is no necessary symmetry in one's orientation toward the two communities; openness to the L2 community can coexist with attachment to the L1 community. When strong attachment is present, this may lower the effect of existing openness to the L2 group. Strong attachment to the L1 community might be motivated by a sense of threat to one's L1 identity. In this case, learners may need a sense of security through believing that the L2 does not subtract one's L1 identity (cf. Lambert, 1973).

In this study, attachment to the L1 community was operationalized by three scales: fear of assimilation, ethnocentrism, and religious attitudes. That implicit attitudes correlated negatively with these scales, especially with fear of assimilation, invites speculation on the nature of implicit attitudes. Originally, fear of assimilation was investigated primarily in the Canadian context, where French speakers were at risk of being assimilated into the dominant Anglophone culture (e.g., Clément, 1980). Today, with the unprecedented worldwide spread of the English language, fear of assimilation may no longer be confined to minorities living in

the shadows of another a dominant group. Many learners around the world probably feel that Global English is a form of Westernization invading their cultural distinctiveness (see Dörnyei et al., 2006, for an in-depth analysis). According to Giles, Bourhis, and Taylor (1977), cultural distinctiveness becomes under threat when ethnolinguistic vitality is undermined. Ethnolinguistic vitality depends on three dimensions: language status (such as economic, social, and historical), the demography of speakers of the language (including their number and their distribution), and the institutional support it receives (both formal and informal). Perceived threat to any of these dimensions can raise fear of assimilation into the dominant group.

Thus, fear of assimilation must be conceptualized as a relative construct, one that accounts for *both* openness to the L2 group and attachment to the L1 group. As Clément (1980) puts it: “Whether the resulting tendency is positive or negative would be determined by a delicate balance, here expressed as a subtractive relationship, of the respective statuses of the first and second culture in a given community” (p. 150). Therefore, it is likely that openness to the L2 group represents only half of the picture. The other half is represented by the confidence in the preservation of the L1 community as perceived by the learner. Without a sufficient degree of assurance, the learner may still experience fear of assimilation.

The ensuing fear of assimilation need not be explicit, however. Proficiency in a language like English certainly leads to undeniable advantages, including in degree attainment and career advancement. At the social level, in many contexts around the world, English “correlates with urbanity, advanced education, an international outlook that tends to go together with higher social strata” (Schneider, 2011, p. 342). It is also the “language of modernity, superiority, prestige, and sophistication” (Sugiharto, 2015, p. 232). This is an interesting predicament. The learner is faced with two choices, whether to learn the language and reap its benefits ‘selfishly’, or to try and preserve the distinctiveness and vitality of the first language ‘selflessly’. A learner in this situation may be bound to experience ambivalent feelings reflecting an explicit–implicit conflict.

This conceptualization might constitute an interesting twist in the classical construct of integrativeness. It highlights the benefit of identification with the L1 group while learning an L2. Some preliminary evidence might give support to this view. In the African context, Coetzee-Van Rooy (2006) reports that learners who identified more strongly with their in-group are the ones who achieved higher in English. In this case, the target group is the in-group. Research in other contexts has similarly shown that using the L1 as the language of instruction in school, which can be seen as enhancing in-group identification, has a positive

effect on success in English (Genesee, Lindholm-Leary, Saunders, & Christian, 2006; Rolstad, Mahoney, & Glass, 2005; Slavin & Cheung, 2005; Willig, 1985). This might imply that possessing an integrative motivation, but toward the in-group rather than only toward an out-group, has a positive effect on both the affective and the academic levels. A similar picture is found in the context of learning languages other than English. It has been observed that one motive for learning a language other than English is the attempt to connect with one's own group, whether real or imagined (Duff & Li, 2009). For example, as part of degree requirements, many students select a certain language to study because it is their own ancestral language, such as Chinese and Korean (e.g., Comanaru & Noels, 2009). Again, the target group to identify with here is the in-group. This might be an interesting dimension to integrative motivation. However, as mentioned above, these findings are at best preliminary and suggestive, as most of these studies were not designed to test the question of L1 identification specifically. Instead, this idea emerged from the data. More direct testing of this hypothesis and its mechanisms and moderators would therefore be an interesting future direction.

As reviewed in Chapter 6, the Saudi context presents a unique situation. The political and religious dynamics have cultivated both Islamic supremacism and animosity toward the West. It has even led to terrorist activities at a global scale. This cultural baggage may take a toll on learning English. The results of this thesis show that religious attitudes are associated with fear of assimilation and ethnocentrism, both being the antithesis of openness to the L2 group. Further supporting this view is the fact that religious attitudes had a negative correlation with achievement in the language. These results are in line with the notion that religious supremacy leads to higher attachment to the L1 community and lower openness to the L2 group, thus negatively affecting success in learning the language of that group.

The discussion in this section thus far might seem rather unconventional. It has dealt with themes such as religiosity, supremacism, and terrorism, none of which are conventional topics in the language motivation literature. However, looking at such broad cultural dynamics can help provide a deeper perspective into classroom micro-dynamics. As an illustration, Nespor (1997) reports on his two-year school ethnography to demonstrate that the classroom—far from being an empty ‘container’ to be filled by teacher–student interactions—embodies the intersections of local politics, regional economics, school–community conflicts, corporate influences, body discourses, neighborhood histories, and popular media. In other words, “the key to understanding education isn’t to be found in what happens *in* classrooms or schools but in the relations that bind them to networks of practice

extending beyond” (Nespor, 1997, p. xiii, original emphasis). Or as Larsen-Freeman and Cameron (2008) put it, “there is no chance that... [our decisions] can be disconnected from the social-political-historical-moral-cultural influences of our time” (p. 76). The language motivation field has recently been moving toward a socio-dynamic approach (Dörnyei & Ryan, 2015). This approach is not incompatible with the broader perspective discussed in this section.

This broader perspective also calls attention to the critical role of the language teacher. From this perspective, it becomes inevitable that the teacher’s role bears “value-oriented, moral, and ethical dimensions” (Kubanyiova & Crookes, 2016, p. 119). According to Kumaravadivelu’s (2003) analysis, conceptualizations of the role of the teacher have passed through three phases. The first phase viewed the teacher as a *passive technician*, who is just a transmitter of content knowledge through breaking it down to discrete and manageable parts. The second phase promoted the teacher to a *reflective practitioner*, who is a problem-solver following a holistic approach that involves creativity and context-sensitivity. Finally, the third phase considers the teacher as a *transformative intellectual*, who educates students “to take risks, to struggle for institutional change, and to fight both *against* oppression and *for* democracy outside of schools in other oppositional public spheres and the wider social arena” (Giroux, 1988, p. xxxiii, original emphases). Indeed, conceptualizing the role of the teacher as a transformative intellectual “stretches their role beyond the borders of the classroom” (Kumaravadivelu, 2003, p. 14), and has been described as possibly “the most significant development in language teacher identity research” (Morgan & Clarke, 2011, p. 825).

Fortunately, the language class has two unique characteristics that makes this role a bit less formidable of a task. First, thanks to the dominance of communicative language teaching today, the language teacher is typically the only teacher who can simply walk into the classroom and start ‘chatting’ with the students about a topic of choice until the end of the lesson and still be considered ‘teaching’. Although not all teachers have this luxury, many do at least during speaking activities such as group discussions, presentations, and written essays. This puts the language teacher in a unique position to promote critical thinking and to develop ethical standards—beyond learning the mechanics of the language—through carefully selected topics and well-structured dialogues.

A second unique feature of the language class is that teaching the language involves introducing learners to aspects of another culture (Gardner, 1985). In fact, the language class typically constitutes the learner’s first systematic exposure to the L2 culture, and so the

teacher has the ability to mold the learner's attitudes (positively or negatively) toward that group. In recognition of this potential, Lamb and Budiyo (2013) advocate exploiting aspects of the L2 culture in order to uncover learners' stereotypes and to critique them. Lamb and Budiyo (2013) also argue that this approach, rather than being a purely egalitarian exercise, may foster cultural identification and then inspire both short- and long-term motivation to learn the language.

Thus, language teachers in the Saudi context have the potential to influence their students' explicit and implicit attitudes, a responsibility dictated by ethical and moral imperatives. This reinforces the view of the teacher as a moral agent (Kubanyiova & Crookes, 2016). The language classroom becomes an ideal opportunity for promoting tolerance, cross-cultural respect, and peaceful coexistence—or as Brophy (2009) describes it, the “proactive implantation of new motivational systems” (p. 152). This analysis might constitute an initial seed toward a philosophy of language learning motivation.

A century ago, renowned educator John Dewey maintained that, “The criterion of the value of school education is the extent in which it creates a desire for continued growth and supplies means for making the desire effective in fact” (Dewey, 1916, p. 62). Our field has the potential to live up to this dream.

7.3 Limitations and future directions

This thesis has hopefully shed some light on some aspects that have not received due attention in the field. The results might inspire investigations into ‘the other side’ of our constructs. This might lead to interesting discoveries, such as implicit sources of student (and even teacher) demotivation. This thesis has used two implicit tests, but there are many more tests to explore. Nosek et al. (2011), for example, review 20 different implicit measures. In addition, the religious attitudes scale was developed for the purpose of the present research and was not grounded on prior theoretical or psychometric research. Furthermore, the ought-to L2 self scale draws mostly from promotion-related items rather than prevention-related ones (see Taguchi et al., 2009). It would be interesting to examine in future research whether this point makes a difference.

The following discussion addresses two aspects that have not been addressed in detail in the present thesis, one related to causality and the other malleability.

7.3.1 Causality

A limitation of the design of the two studies of this thesis is that they are both observational, and so the direction of causality cannot be determined unequivocally. The use of ‘effect’ and ‘predict’ throughout this thesis has been intended in the statistical sense only. This is standard practice in statistical terminology. For example, when researchers calculate ‘effect sizes’ of their results, this size of the ‘effect’ is concerned with the magnitude of the variance explained and does not have any causal implications of one variable having an effect on another. Statistical procedures used in this thesis, such as *t*-test and ANOVA, are fundamentally simplified regression equations (Cohen, 1968). Because of the observational nature of this research, hardly any pedagogical implications have been suggested in this thesis. Although it has become common in recent years to expect pedagogical implications even from observational studies, extreme caution must be exercised here. Making pedagogical implications usually assumes causality (for more discussion, see Gardner & Tremblay, 1994).

One way to address this issue is to adopt an experimental research design. The various experimental research designs available involve intentional manipulation of variables and then observing the effect. Other approaches involve longitudinal designs, in which the researchers investigate whether change of one variable over time is followed by change in another variable. An example of this design is cross-lagged panel design (e.g., Finkel, 1995). Still, because such designs are observational and do not involve manipulation, their results

suggest that the causal relationship plausible, not conclusive. Other designs that could also shed light on causality include regression discontinuity designs, instrumental variable designs, matching and propensity score designs, and comparative interrupted time series designs (see Y. Kim & Steiner, 2016).

7.3.2 Malleability

The above discussion about studying causality through experimentation implies that implicit attitudes are malleable. Otherwise, the possibility of manipulation would be ruled out. Indeed, there is some research showing that implicit attitudes are malleable. For example, Dasgupta and Greenwald (2001) conducted two experiments and found that exposure to positive and negative models from a target community can improve and decrease implicit attitudes, respectively. In another study, Gregg, Seibt, and Banaji (2006) also found that it is possible to induce positive and negative implicit attitudes about an imagined community. That is, simply asking participants to imagine a hypothetical social group can lead to the development of implicit attitudes toward that group. Once formed, implicit attitudes become more resistant to change. However, Blair, Ma, and Lenton (2001) conducted five experiments and demonstrated that engaging in mental imagery can counteract the effect of negative implicit attitudes (see also Blair, 2002). Considering the recent interest in mental imagery in our field (e.g., Hadfield & Dörnyei, 2013; Kubanyiova, 2014), there seem to be interesting possibilities for future research.

In an interesting study, Lai and colleagues (2014) conducted a large scale set of experiments ($N = 17,021$) testing the effectiveness of 17 different interventions aiming at altering implicit attitudes. Their results pointed to several effective interventions, but the most effective intervention was using a *vivid counterstereotypic scenario*. According to this intervention, the participants read an evocative story and imagine themselves in this story. In testing this intervention, the researchers asked the participants to read a narrative story involving this statement: “With sadistic pleasure, he bashes you with his bat again and again” (p. 1771). After reading this story, the participants’ implicit attitudes were successfully influenced. This demonstrates the power of mental imagery stimulated by narrative stories.

Perhaps more interestingly, the researchers then increased the vividness of the narrative:

With sadistic pleasure, he beats you again and again. First to the body, then to the head. You fight to keep your eyes open and your hands up. The last things you

remember are the faint smells of alcohol and chewing tobacco and his wicked grin.
(Lai et al., 2014, p. 1771)

After reading this (highly) vivid narrative, the intervention became more than doubly effective. This is another clear illustration of the power of vivid imagery in altering implicit attitudes.

In a subsequent study, Lai and colleagues Lai et al. (2016) wanted to assess the durability of attitude change resulting from these interventions. Their results showed that the effect is short-term, and that the participants' implicit attitudes revert to their original level within a couple of days at most. Lai and colleagues suggest that longer-term durability might be achieved through repeated and prolonged intervention. In support of this view, Devine, Forscher, Austin, and Cox (2012) successfully induced durable change in implicit attitudes through a 12-month multifaceted intervention program. The effect still existed eight weeks after the end of the intervention. Repeated practice leads to increased automaticity of activation (Logan, 1988; Nosek, 2005).

7.4 Concluding remarks

This thesis has argued that the implicit side of attitudes and motivation may constitute a more important component in the overall understanding of language learning motivation than is currently acknowledged in mainstream theories. Focusing entirely on explicit attitudes and motivation in empirical studies could mask the potential impact of any conflicting implicit attitudes. The findings of this thesis offer evidence that this impact can in some subgroups change the results substantially, which in turn suggests that adding an implicit dimension to our overall understanding of motivation may be a fruitful future direction.

This thesis has shown that L2 learners who had stronger implicit preference for L2 speakers (i.e., explicit–implicit congruence) also expressed stronger affiliation with the L2 group as well as less fear of assimilation and ethnocentric concerns than did explicit–implicit incongruent learners. Implicit attitudes are thus related to other attitudinal/motivational factors, and this might be a step toward solving Ushioda’s (2013) puzzle about the divergence between the importance of English and the motivation to learn it, as quoted at the beginning of the introduction to this thesis.

While the ‘self’ has served as a useful metaphor in L2 motivation for around a decade and has advanced the field beyond integrativeness, “the multitude of overlapping concepts in the literature on the self is more confusing than integrativeness ever could be” (MacIntyre et al., 2009, p. 54). This may not be undesirable. The complexity of the self may open up countless possibilities for future research on a multitude of aspects, conscious and unconscious.

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Appendices

Appendix A: Implicit test stimuli

Study 1

Pleasant مبهج	Unpleasant مزعج	Arabic عربي	English إنجليزي
Kind طيب	Mean لنيم	Mohammad محمد	George جورج
Beautiful جميل	Ugly قبيح	Fatimah فاطمة	Elizabeth إليزابيث
Honest أمين	Dishonest خائن	Mecca مكة	London لندن
Optimistic متفائل	Pessimistic متشائم	Jordan الأردن	Britain بريطانيا
Fair عادل	Unfair ظالم	Ibn Khaldun ابن خلدون	Newton نيوتن
Knowledgeable عالم	Ignorant جاهل	Hatim al-Tai حاتم الطائي	Robin Hood روبن هود
Hardworking مجتهد	Lazy كسول	Al-Mutanabbi المتنبي	Shakespeare شكسبير
Polite مؤدب	Impolite وقح	Cairo University جامعة القاهرة	Oxford University جامعة أكسفورد
Cheerful مرح	Cheerless كئيب	Kuwaiti Dinar دينار كويتي	Pound Sterling جنيه إسترليني
Clean نظيف	Dirty قذر	Aljazeera قناة الجزيرة	BBC البي بي سي

Study 2

L2 Speakers ST-IAT			L2 Course ST-IAT		
Pleasant مبهج	Unpleasant مزعج	Native Speakers المتحدثين بالإنجليزي	Pleasant مبهج	Unpleasant مزعج	English Course مادة الإنجليزي
Kind طيب	Mean لئيم	George جورج	Interesting ممتع	Boring ممل	Grammar قواعد
Beautiful جميل	Ugly قبيح	Elizabeth إليزابيث	Clear واضح	Complicated معقد	Vocabulary مفردات
Honest أمين	Dishonest خائن	New York نيويورك	Valuable مفيد	Time- Wasting مضيعة للوقت	Listening استماع
Optimistic متفائل	Pessimistic متشائم	Britain بريطانيا	Important مهم	Trivial تافه	Reading قراءة
Fair عادل	Unfair ظالم	Newton نيوتن	Varied متنوع	Monotonous روتيني	Speaking تحدث
Knowledgeable عالم	Ignorant جاهل	Robin Hood روبن هود	Satisfying مشعر بالرضى	Dissatisfying مشعر بالاستياء	Writing كتابة
Hardworking مجتهد	Lazy كسول	Shakespeare شكسبير	Good جيد	Bad سيئ	Learning تعلم
Polite مودب	Impolite وقح	Oxford University جامعة أكسفورد	Appealing جذاب	Repellent منفر	Studying مذاكرة
Cheerful مرح	Cheerless كئيب	Dollar دولار	Encouraging مشجع	Discouraging محبط	Lecture محاضرة
Clean نظيف	Dirty قذر	BBC البي بي سي	Clean نظيف	Dirty قذر	Teacher مدرس

Appendix B: Questionnaire items

Study 1

Attitudes toward English-Speaking People

I wish I could have many more English friends.
أتمنى لو كان لدي عدد أكبر من الأصدقاء الإنجليزيين.

I think my fellow students should make more English friends.
أنصح زملائي الطلاب بتكوين المزيد من الصداقات مع الإنجليزيين.

I'd like to know more English people.
أود التعرف على المزيد من الأشخاص الإنجليزيين.

Attitudes toward Learning English

Learning English is very interesting.
تعلم اللغة الإنجليزية مشوق جدا.

I enjoy learning English.
أنا أستمتع بتعلم اللغة الإنجليزية.

I feel that time passes fast while studying English.
أنا أشعر أن الوقت يمر بسرعة أثناء تعلم اللغة الإنجليزية.

If it were my choice, I would spend more time learning English.
لو كان ذلك بيدي، فإني سوف أقضي وقتا أطول في تعلم اللغة الإنجليزية.

Ideal L2 Self

I can imagine myself mastering English one day.
يمكنني أن أتخيل نفسي وقد أتقنت اللغة الإنجليزية يوما ما.

I can imagine that I will be able to communicate with English speakers as easily as I do it in Arabic.
يمكنني أن أتخيل أنني سوف أستطيع التواصل مع المتحدثين بالإنجليزية بسهولة وكأنني أتحدث بالعربية.

I can imagine myself one day reaching the stage when I can write English letters and documents without any problem.
يمكنني أن أتخيل نفسي يوما ما وقد وصلت لمرحلة تمكنني من كتابة الرسائل والمستندات الإنجليزية بدون أي مشاكل.

I can imagine that I will be able to watch English movies without any problems of understanding them.
يمكنني أن أتخيل أنني سوف أستطيع مشاهدة الأفلام الإنجليزية بدون أي مشاكل في فهمها.

I can imagine that I will be able to watch English movies without any problems of understanding them.
يمكنني أن أتخيل أنني سوف أستطيع مشاهدة الأفلام الإنجليزية بدون أي مشاكل في فهمها.

Ought-to Self

I must study English because it will earn me respect [recognition] in the society.
يجب علي أن أتعلم اللغة الإنجليزية لأنها سوف تكسبني الاحترام في المجتمع.

I must study English because people close to me believe it is important.
يجب علي أن أتعلم اللغة الإنجليزية لأن الناس المقربين مني يعتقدون أن ذلك أمر ضروري.

Studying English is important to me because this will make me an educated person.
تعلم اللغة الإنجليزية مهم بالنسبة لي لأن ذلك سيجعلني شخصا مثقفا.

Fear of Assimilation

I think that the interest in the West has a negative influence on the Arab culture.
أنا أظن أن الاهتمام بالغرب له تأثير سلبي على الثقافة العربية.

Arabic has become contaminated because of the influence of the English language.
أنا أعتقد أن اللغة العربية أصبحت ملوثة بسبب تأثير اللغة الإنجليزية عليها.

I think the morals of Arabs have become worse because of the negative influence of the West.
أنا أعتقد أن أخلاقيات العرب أصبحت أسوأ بسبب تأثير الدول الإنجليزية السلبية.

I think the cultural values of the West spread at the expense of the values of Arabs.
أنا أعتقد أن قيم الدول الإنجليزية تنتشر على حساب القيم العربية.

Openness to the West constitutes a threat of losing the Arab identity.
إن الانفتاح على الثقافات الأخرى يشكل تهديدا بفقد الهوية العربية.

Ethnocentrism

I find it difficult to work together with people who have different customs.
أنا أجد صعوبة في العمل مع أشخاص يخالفونني في العادات والتقاليد.

It is hard for me to accept the behavior of people from other cultures.
يصعب عليّ تقبل سلوك الأشخاص الذي ينتمون لثقافات أخرى.

I think the world would be better if everybody lived the way Arabs live.
أنا أظن أن العالم سوف يكون أفضل لو أن كل الناس عاشوا كما يعيش العرب.

I often think that Christians are enemies to Muslims.
غالبا ما يخطر على بالي أن المسيحيين أعداء للمسلمين.

Westerners are ignorant because they have not accepted Islam.
إن الغربيين جهلة لأنهم لم يعتنقوا الإسلام.

Religious Attitudes

The idea of sharing my Islamic faith with my non-Muslim friends is always present in my mind.
فكرة دعوة أصحابي غير المسلمين للإسلام دائما حاضرة على بالي.

I feel upset when I see things that violate Sharia law among the English.
أنا أتضايق عندما أرى ما يخالف الشريعة الإسلامية عند الإنجليز.

I try to avoid looking like non-Muslims, such as in dress and haircut.
أنا أحاول الابتعاد عن التشبه بغير المسلمين في الشكل كاللباس وقصات الشعر.

I pity the English because they are non-Muslims.
يراودني شعور بالشفقة على الإنجليز لأنهم غير مسلمين.

Attitudes toward Arabs – Semantic Differential

Unfair / Fair
عادل / ظالم

Polite / Impolite (R)
وقح / مؤدب

Cheerless / Cheerful
مريح / كئيب

Mean / Kind
طيب / لنيم

Pleasant / Unpleasant (R)
مزعج / مبهج

Lazy / Hardworking
كسول / مجتهد

Beautiful / Ugly (R)
قبيح / جميل

Ignorant / Knowledgeable
عالم / جاهل

Dishonest / Honest
أمين / خائن

Pessimistic / Optimistic
متفائل / متشائم

Attitudes toward the English – Semantic Differential

Unfair / Fair
عادل / ظالم

Polite / Impolite (R)
وقح / مؤدب

Cheerless / Cheerful
مريح / كئيب

Mean / Kind

طيب / لنيم

Pleasant / Unpleasant (R)

مز عج / مبهج

Lazy / Hardworking

كسول / مجتهد

Beautiful / Ugly (R)

قبيح / جميل

Ignorant / Knowledgeable

عالم / جاهل

Dishonest / Honest

أمين / خائن

Pessimistic / Optimistic

متفائل / متشائم

Study 2

Ideal L2 Self

I can imagine myself mastering English one day.
يمكنني أن أتخيل نفسي وقد أتقنت اللغة الإنجليزية يوماً ما.

I can imagine that I will be able to communicate with English speakers as easily as I do it in Arabic.
يمكنني أن أتخيل أنني سوف أستطيع التواصل مع المتحدثين بالإنجليزية بسهولة وكأنني أتحدث بالعربية.

I can imagine myself one day reaching the stage when I can write English reports without any problem.
يمكنني أن أتخيل نفسي يوماً ما وقد وصلت لمرحلة تمكنني من كتابة التقارير الإنجليزية بدون أي مشاكل.

I can imagine that I will be able to watch English programs without any problems of understanding them.
يمكنني أن أتخيل أنني سوف أستطيع مشاهدة البرامج الإنجليزية بدون أي مشاكل في فهمها.

Ought-to Self

I must study English because it will earn me respect in the society.
يجب عليّ أن أتعلم اللغة الإنجليزية لأنها سوف تكسبني الاحترام في المجتمع.

Studying English is important to me because this will make me an educated person.
تعلم اللغة الإنجليزية مهم بالنسبة لي لأن ذلك سيجعلني شخصاً مثقفاً.

Studying English is important to me because it will help me get a good job someday.
تعلم اللغة الإنجليزية مهم بالنسبة لي لأن ذلك سيساعدني على الحصول على وظيفة جيدة يوماً ما.

Studying English is important to me because it is an important factor for promotions in my future career.
تعلم اللغة الإنجليزية مهم بالنسبة لي لأن ذلك عامل مهم للحصول على ترقية في وظيفتي المستقبلية.

Intended Effort

I am prepared to expend a lot of effort in learning English.
لدي الاستعداد لبذل الكثير من الجهد في تعلم اللغة الإنجليزية.

I would like to spend lots of time studying English.
أنا أرغب في قضاء وقت أطول في تعلم اللغة الإنجليزية.

If I was offered to study English in the future, I would study it.
لو عُرض عليّ دراسة اللغة الإنجليزية في المستقبل، فسوف أدرسها.

I want to master English in order to keep informed of the latest news of the world.
أريد إتقان اللغة الإنجليزية حتى أكون مطلعاً على آخر مستجدات الأخبار حول العالم.

One of the reasons that motivate me to learn English is I want to be able to communicate with more people.

أحد الأسباب التي تدفعني لتعلم اللغة الإنجليزية هو أنني أريد أن أصبح قادراً على التواصل مع عدد أكبر من الناس.

Family Support

My parents encourage me to study English.
يشجعني والداي على دراسة اللغة الإنجليزية.

My family pressure me to do my best in my studies.
يقوم أهلي بالضغط عليّ لأبذل جهدي في دراستي.

My parents follow up with my progress in the College.
يتابع والداي تقدمي في الكلية.

My parents feel happy when I get high marks.
يشعر والداي بالسعادة عندما أحصل على درجات عالية.

Fear of Assimilation

I think that the interest in the West has a negative influence on the Arab culture.
أنا أظن أن الاهتمام بالغرب له تأثير سلبي على الثقافة العربية.

Arabic has become contaminated because of the influence of the English language.
أنا أعتقد أن اللغة العربية أصبحت ملوثة بسبب تأثير اللغة الإنجليزية عليها.

I think the morals of Arabs have become worse because of the negative influence of the West.
أنا أعتقد أن أخلاقيات العرب أصبحت أسوأ بسبب التأثير السلبي للدول الغربية.

I think the cultural values (like their customs) of the West spread at the expense of the values of Arabs.
أنا أعتقد أن قيم الدول الغربية (كعاداتهم وتقاليدهم) تنتشر على حساب القيم العربية.

Openness to the West constitutes a threat of losing the Arab identity.
إن الانفتاح على الثقافات الأخرى يشكل تهديداً بفقد الهوية العربية.

Ethnocentrism

I find it difficult to work together with people who have different customs.
أنا أجد صعوبة في العمل مع أشخاص يخالفونني في العادات والتقاليد.

It is hard for me to accept the behavior of people from other cultures.
يصعب عليّ تقبل سلوك الأشخاص الذي ينتمون لثقافات أخرى.

Religious Attitudes

When I see a non-Muslim, the idea of sharing my Islamic faith with them comes to my mind immediately.
عندما أرى شخصاً غير مسلم، فإن فكرة دعوته للإسلام تحضر في بالي مباشرة.

I feel upset when I see things that violate Sharia law among Westerners.
أنا أتضايق عندما أرى ما يخالف الشريعة الإسلامية عند الغربيين.

I try to avoid emulating infidels in appearance, such as in clothing and haircut.
أنا أحاول الابتعاد عن التشبه بالكفار في الشكل كاللباس وقصات الشعر.

I pity the English because they are non-Muslims.
يراودني شعور بالشفقة على الإنجليزيين لأنهم غير مسلمين.

I sometimes think that Christians are enemies to Muslims.
غالباً ما يخطر على بالي أن المسيحيين أعداء للمسلمين.

Westerners are living in darkness because they have not accepted Islam.
إن الغربيين يعيشون في ظلام لأنهم لم يعتنقوا الإسلام.

Social Desirability

I never hesitate to go out of my way to help someone in trouble.
أنا لا أتردد أبداً في ترك عملي لأجل مساعدة شخص يحتاج للمساعدة.

It is sometimes hard for me to go on with my work if I am not encouraged. (R)
في بعض الأحيان، أنا أجد صعوبة في متابعة عملي إذا لم أجد تشجيعاً من أحد.

I have never intensely disliked anyone.
لم يحدث أنني كرهتُ أحداً بشدة في حياتي أبداً.

On occasion, I have had doubts about my ability to succeed in life. (R)
مرت عليّ بعض الأوقات التي راودني فيها الشك في قدرتي على النجاح.

I sometimes feel resentful when I don't get my way. (R)
أحياناً أشعر بالغضب عندما لا تجري الأمور بحسب ما أريد.

My table manners at home are as good as when I eat out in a restaurant.
طريقة أكلي في البيت لا تختلف عن طريقة أكلي في المطعم.

On a few occasions, I have given up doing something because I thought too little of my ability. (R)
في مرة من المرات، استمعتُ لشخص يغتاب شخصاً آخر واستمعتُ بذلك.

No matter who I'm talking to, I'm always a good listener.
أنا دائماً مستمع جيد للآخرين بغض النظر عن من هو الشخص الذي أتحدث معه.

I can remember "playing sick" to get out of something. (R)
لقد حدث أن تظاهرتُ بالمرض في يوم من الأيام لكي أتخلص من عمل ما.

There have been occasions when I took advantage of someone. (R)
لقد قمتُ باستغلال شخص ما في مرة من المرات.

I'm always willing to admit it when I make a mistake.
عندما أرتكب خطأ فأنا دائماً مستعد للاعتراف به.

I always try to practice what I preach.
أنا دائماً أطبق ما أنصح الآخرين به.

I sometimes try to get even rather than forgive and forget. (R)
أنا أحيانا أفضل أن آخذ بحقي بدلا من أن أعفو عما سلف.

When I don't know something I don't at all mind admitting it.
عندما أكون جاهلا بأمر ما، فإنه لن يكون لدي مانع من أن أعترف بذلك.

I am always courteous, even to people who are disagreeable.
أنا دائما مهذب، حتى مع من هو ثقيل الدم.

At times, I have really insisted on having things my own way. (R)
هناك بعض الأحيان التي أصريت فيها على أن تسري الأمور حسب طريقتي.

There have been occasions when I felt like smashing things. (R)
كانت هناك بعض الأحيان التي شعرتُ فيها بالرغبة في تحطيم الأشياء بسبب الغضب.

I never resent being asked to return a favor.
أنا لا أستاء أبدا عندما يُطلب مني رد الجميل.

I have never been annoyed when people expressed ideas very different from my own.
أنا لا أتضايق أبدا عندما يبدي الناس آراء تختلف عن رأيي.

There have been times when I was quite jealous of the good fortune of others. (R)
كانت هناك بعض الأوقات التي شعرت فيها بالغيرة من حظ الآخرين.

I have almost never felt the urge to tell someone off.
أنا لم أشعر مرة بالرغبة في أوبخ شخصا ما.

I am sometimes irritated by people who ask favors of me. (R)
أنا أحيانا أتضايق عندما يطلب أحد مني خدمة.

I have never felt that I was punished without cause.
أنا لم أشعر أبدا بأنني عوقبت بدون سبب.

I sometimes think when people have a misfortune they only got what they deserved. (R)
عندما يصاب شخص بمصيبة، فإني أحيانا أشمتُ به بيني وبين نفسي وأقول بأنه نال ما يستحق.

I have never deliberately said something that hurt someone's feelings.
أنا لم أتعمد أن أقول شيئا يجرح شعور الآخرين أبدا.

Attitudes toward L2 Speakers – Semantic Differential

Lazy / Hardworking (R)
كسول / مجتهد

Mean / Kind
طيب / لئيم

Pessimistic / Optimistic
متفائل / متشائم

Polite / Impolite (R)
وقح / مؤدب

Unfair / Fair
عادل / ظالم

Cheerless / Cheerful
مرح / كئيب

Beautiful / Ugly (R)
قبيح / جميل

Pleasant / Unpleasant (R)
مزعج / مبهج

Ignorant / Knowledgeable
عالم / جاهل

Dishonest / Honest
أمين / خائن

L2 Learning Experience – Semantic Differential

Boring / Interesting
ممتعة / مملة

Complicated / Clear
واضحة / معقدة

Pleasant / Unpleasant (R)
مزعجة / مبهجة

Time-Wasting / Valuable
مفيدة / مضيعة للوقت

Trivial / Important
مهمة / تافهة

Bad / Good

جيدة / سينة

Appealing / Repellent (R)
منفرة / جذابة

Discouraging / Encouraging
مشجعة / محبطة

Appendix C: Correlation tables

Table C.1: Zero-order correlations for the male (above the diagonal, $n = 257$) and female (below the diagonal, $n = 108$) subsamples.

	1	2	3	4	5	6	7	8	9	10	11
1. Attitudes to English-Speaking People	—	.45***	.18**	.31***	-.17**	-.13*	-.08	.03	.30***	.18**	.08
2. Attitudes to Language Learning	.34***	—	.21***	.34***	-.08	.09	.09	.06	.21***	.13*	.03
3. Ideal L2 Self	.18†	.10	—	.17**	-.07	.06	.08	.15*	.00	-.09	-.05
4. Ought-to L2 Self	.27**	.27**	.09	—	.18**	.19**	.02	.03	.24***	.13*	-.09
5. Fear of Assimilation	-.02	-.02	-.08	.04	—	.55***	.35***	.18**	-.24***	-.31***	-.27***
6. Ethnocentrism	-.04	.22*	-.18†	.21*	.49***	—	.52***	.32***	-.17**	-.38***	-.19**
7. Religious Attitudes	.13	.16†	.00	-.02	.30**	.38***	—	.32***	-.12*	-.31***	-.21***
8. Attitudes to Arabs—SDS	.11	-.01	.02	.02	-.04	.18†	.24**	—	.07	-.70***	-.12*
9. Attitudes to the English—SDS	.52***	.18†	-.09	.08	-.09	.06	-.04	.23*	—	.59***	.10
10. Explicit D Measure	.28**	.16	-.05	.02	.00	-.12	-.19*	-.70***	.49***	—	.14*
11. Implicit D Measure	-.11	-.09	-.02	.08	-.16†	-.06	-.10	-.10	-.16†	-.05	—

Note. SDS = semantic differential scale.

*** $p \leq .001$, ** $p \leq .01$, * $p \leq .05$, † $p < .10$

Table C.2: Zero-order correlations for the male participants who had L1 (below the diagonal, $n = 128$) and L2 (above the diagonal, $n = 129$) implicit preference.

	1	2	3	4	5	6	7	8	9	10	11
1. Attitudes to English-Speaking People	—	.50***	.32***	.39***	-.27**	-.16†	-.20*	-.10	.36***	.33***	.09
2. Attitudes to Language Learning	.40***	—	.23**	.34***	-.23**	.11	.05	-.02	.32***	.29***	.03
3. Ideal L2 Self	.04	.19*	—	.20*	-.10	-.02	-.02	.14	-.04	-.10	-.01
4. Ought-to L2 Self	.25**	.35***	.14	—	.12	.15†	-.01	-.01	.26**	.20*	-.07
5. Fear of Assimilation	-.06	.08	-.06	.22**	—	.51***	.39***	.17*	-.22**	-.30***	-.34***
6. Ethnocentrism	-.08	.09	.13	.20*	.57***	—	.55***	.32***	-.11	-.31***	-.22**
7. Religious Attitudes	.08	.16†	.18*	.05	.28***	.47***	—	.35***	-.13	-.33***	-.29***
8. Attitudes to Arabs—SDS	.18*	.14	.14	.05	.16†	.31***	.27**	—	.00	-.68***	-.19*
9. Attitudes to the English—SDS	.23**	.09	.05	.23**	-.25**	-.22**	-.11	.16†	—	.66***	.15†
10. Explicit D Measure	.03	-.04	-.07	.08	-.29***	-.42***	-.26**	-.71***	.52***	—	.21*
11. Implicit D Measure	-.03	-.07	.01	-.03	-.11	-.01	-.05	.05	-.01	-.08	—

Note. SDS = semantic differential scale.

*** $p \leq .001$, ** $p \leq .01$, * $p \leq .05$, † $p < .10$

Table C.3: Zero-order correlations for the female participants who had L1 (below the diagonal, $n = 54$) and L2 (above the diagonal, $n = 54$) implicit preference.

	1	2	3	4	5	6	7	8	9	10	11
1. Attitudes to English-Speaking People	—	.61***	.14	.37**	.00	-.06	.16	.06	.61***	.36**	-.01
2. Attitudes to Language Learning	.05	—	.07	.21	.05	.22	.21	.00	.22	.16	.11
3. Ideal L2 Self	.20	.12	—	.17	-.09	-.20	-.17	-.05	-.04	.08	.29*
4. Ought-to L2 Self	.14	.32*	.00	—	.12	.20	-.03	-.02	.12	.08	.15
5. Fear of Assimilation	-.10	-.13	-.13	-.08	—	.54***	.24†	.05	-.15	-.09	-.08
6. Ethnocentrism	-.02	.22	-.17	.22	.34***	—	.39**	.22	-.18	-.29*	.09
7. Religious Attitudes	.08	.12	.14	-.02	.37**	.36**	—	.37**	.02	-.25†	.02
8. Attitudes to Arabs—SDS	.18	-.02	.09	.07	-.22	.12	.09	—	.16	-.76***	-.07
9. Attitudes to the English—SDS	.41**	.14	-.16	.04	-.03	.27*	-.11	.30*	—	.47***	-.19
10. Explicit D Measure	.16	.16	-.21	-.06	.15	.08	-.13	-.63***	.53***	—	-.04
11. Implicit D Measure	-.10	-.32*	-.08	.23†	-.07	.06	-.08	-.03	-.15	-.18	—

Note. SDS = semantic differential scale.

*** $p \leq .001$, ** $p \leq .01$, * $p \leq .05$, † $p < .10$

Appendix D: R code used to compute Bayes factors

```
#This script is self-contained
#and does not require an associated data file.
#The computations are calculated based on the data below.

#####

#Code for the Bayes factors reported in Tables 6.17 and 6.18:

#Study 1 data:
#n1 = 78, n2 = 84
#ATESP t = 1.99,
#foa t = 3.35
#ethno t = 2.49
#relig = 3.11
#att tw arabs t = 2.48

#Study 2 data (t-values are the square roots of MANCOVA F-values)
#n1 = 112, n2 = 125
#foa t = 2.3
#ethno t = 1.87
#relg t = 1.79
#grades = 2.34

foa.t <- c(3.35, 2.3)
ethno.t <- c(2.49, 1.87)
relig.t <- c(3.11, 1.79)
n1 <- c(78, 112)
n2 <- c(84, 125)

#install the package if not already installed
#install.packages("BayesFactor")
library(BayesFactor)
foa.30 <- meta.ttestBF(foa.t, n1, n2, rscale = .3)
foa.10 <- meta.ttestBF(foa.t, n1, n2, rscale = .1)
foa.50 <- meta.ttestBF(foa.t, n1, n2, rscale = .5)
c("foa.10" = foa.10, "foa.30" = foa.30, "foa.50" = foa.50)

ethno.30 <- meta.ttestBF(ethno.t, n1, n2, rscale = .3)
ethno.10 <- meta.ttestBF(ethno.t, n1, n2, rscale = .1)
ethno.50 <- meta.ttestBF(ethno.t, n1, n2, rscale = .5)
c("ethno.10" = ethno.10, "ethno.30" = ethno.30, "ethno.50" = ethno.50)

relig.30 <- meta.ttestBF(relig.t, n1, n2, rscale = .3)
relig.10 <- meta.ttestBF(relig.t, n1, n2, rscale = .1)
relig.50 <- meta.ttestBF(relig.t, n1, n2, rscale = .5)
c(relig.10, relig.30, relig.50)

#Grades
grades.30 <- ttest.tstat(2.34, 112, 125, simple = T, rscale = .3)
grades.10 <- ttest.tstat(2.34, 112, 125, simple = T, rscale = .1)
grades.50 <- ttest.tstat(2.34, 112, 125, simple = T, rscale = .5)
c("grades.10" = grades.10, "grades.30" = grades.30, "grades.5" =
grades.50)

#####

#Code for the Bayes factors of the cluster analysis:
```

```

#cluster analysis for the MALE samples:

#Study 1:
  #cluster n1 = 129, cluster n2 = 128 ##notice the order is switched##
  #cluster t = 3.27

#Study 2:
  #cluster n1 = 138, cluster n2 = 134
  #cluster t = 2.34

cluster.n1 <- c(129, 138)
cluster.n2 <- c(128, 134)
cluster.t <- c(3.27, 2.34)

cluster.30 <- meta.ttestBF(cluster.t, cluster.n1, cluster.n2, rscale = .3)
cluster.10 <- meta.ttestBF(cluster.t, cluster.n1, cluster.n2, rscale = .1)
cluster.50 <- meta.ttestBF(cluster.t, cluster.n1, cluster.n2, rscale = .5)
c(cluster.10, cluster.30, cluster.50)

#####

#Code for the Bayes factors reported in Tables 6.19 and 6.20:

#Study 1 data:
  #n1 = 178, n2 = 152
  #ideal t = 0.02
  #ought t = -0.70
  #foa t = -5.92
  #ethno t = -9.97
  #ATESP t = 0.09
  #L2experience t = -1.90
  #IATspeakers t = 3.05

#Study 2 data:
  #n1 = 153 n2 = 129
  #ideal t = -2.88
  #ought t = -2.13
  #foa t = -7.14
  #ethno = -3.77
  #ATESP t = -2.01
  #L2experience t = -0.45
  #IATspeakers t = 0.05

ideal.t <- c(.02, -2.88)
ought.t <- c(-0.70, -2.13)
foa.t <- c(-5.92, -7.14)
ethno.t <- c(-9.97, -3.77)
ATESP.t <- c(0.09, -2.01)
L2experience.t <- c(-1.90, -0.45)
IATspeakers.t <- c(3.05, 0.05)

n1 <- c(178, 152)
n2 <- c(153, 129)

library(BayesFactor)
ideal.10 <- meta.ttestBF(ideal.t, n1, n2, rscale = .1)
ideal.30 <- meta.ttestBF(ideal.t, n1, n2, rscale = .3)
ideal.50 <- meta.ttestBF(ideal.t, n1, n2, rscale = .5)
c(ideal.10, ideal.30, ideal.50)

```

```

ought.10 <- meta.ttestBF(ought.t, n1, n2, rscale = .1)
ought.30 <- meta.ttestBF(ought.t, n1, n2, rscale = .3)
ought.50 <- meta.ttestBF(ought.t, n1, n2, rscale = .5)
c(ought.10, ought.30, ought.50)

foa.10 <- meta.ttestBF(foa.t, n1, n2, rscale = .1)
foa.30 <- meta.ttestBF(foa.t, n1, n2, rscale = .3)
foa.50 <- meta.ttestBF(foa.t, n1, n2, rscale = .5)
c(foa.10, foa.30, foa.50)

ethno.10 <- meta.ttestBF(ethno.t, n1, n2, rscale = .1)
ethno.30 <- meta.ttestBF(ethno.t, n1, n2, rscale = .3)
ethno.50 <- meta.ttestBF(ethno.t, n1, n2, rscale = .5)
c(ethno.10, ethno.30, ethno.50)

ATESP.10 <- meta.ttestBF(ATESP.t, n1, n2, rscale = .1)
ATESP.30 <- meta.ttestBF(ATESP.t, n1, n2, rscale = .3)
ATESP.50 <- meta.ttestBF(ATESP.t, n1, n2, rscale = .5)
c(ATESP.10, ATESP.30, ATESP.50)

L2experience.10 <- meta.ttestBF(L2experience.t, n1, n2, rscale = .1)
L2experience.30 <- meta.ttestBF(L2experience.t, n1, n2, rscale = .3)
L2experience.50 <- meta.ttestBF(L2experience.t, n1, n2, rscale = .5)
c(L2experience.10, L2experience.30, L2experience.50)

IATspeakers.10 <- meta.ttestBF(IATspeakers.t, n1, n2, rscale = .1)
IATspeakers.30 <- meta.ttestBF(IATspeakers.t, n1, n2, rscale = .3)
IATspeakers.50 <- meta.ttestBF(IATspeakers.t, n1, n2, rscale = .5)
c(IATspeakers.10, IATspeakers.30, IATspeakers.50)

#####

#Bayes factors reported in Tables 6.19 and 6.20
#for variables that were not included in Study 1:
#IATcourse t = 0.06
#family t = -4.25
#intended t = -1.69
#desirability t = -1.13
#grades t = 3.05
#n1 = 153 n2 = 129

IATcourse.10 <- ttest.tstat(0.06, 153, 129, simple = T, rscale = .1)
IATcourse.30 <- ttest.tstat(0.06, 153, 129, simple = T, rscale = .3)
IATcourse.50 <- ttest.tstat(0.06, 153, 129, simple = T, rscale = .5)
c("IATcourse.10" = IATcourse.10, "IATcourse.30" = IATcourse.30, "grades.5" =
= IATcourse.50)

family.10 <- ttest.tstat(-4.25, 153, 129, simple = T, rscale = .1)
family.30 <- ttest.tstat(-4.25, 153, 129, simple = T, rscale = .3)
family.50 <- ttest.tstat(-4.25, 153, 129, simple = T, rscale = .5)
c("family.10" = family.10, "family.30" = family.30, "family.5" =
family.50)

intended.10 <- ttest.tstat(-1.69, 153, 129, simple = T, rscale = .1)
intended.30 <- ttest.tstat(-1.69, 153, 129, simple = T, rscale = .3)
intended.50 <- ttest.tstat(-1.69, 153, 129, simple = T, rscale = .5)
c("intended.10" = intended.10, "intended.30" = intended.30, "intended.5" =
intended.50)

```

```
desirability.10 <- ttest.tstat(-1.13, 153, 129, simple = T, rscale = .1)
desirability.30 <- ttest.tstat(-1.13, 153, 129, simple = T, rscale = .3)
desirability.50 <- ttest.tstat(-1.13, 153, 129, simple = T, rscale = .5)
c("desirability.10" = desirability.10, "desirability.30" =
desirability.30, "desirability.5" = desirability.50)

grades.10 <- ttest.tstat(3.05, 153, 129, simple = T, rscale = .1)
grades.30 <- ttest.tstat(3.05, 153, 129, simple = T, rscale = .3)
grades.50 <- ttest.tstat(3.05, 153, 129, simple = T, rscale = .5)
c("grades.10" = grades.10, "grades.30" = grades.30, "grades.5" =
grades.50)

citation("BayesFactor")
```