Me and My Future Self: How Perceived Connectedness Shapes Future Thinking and Decision-Making Processes

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Summary

Just as we sometimes feel like a different person now compared to what we were like in the past, we may also imagine becoming a different person in the future. Accumulating evidence indicates that when individuals feel dissimilar to their possible future self, they more strongly prioritise present over future self-interests in their decision-making. However, less is known about how perceived dissimilarity – or low *psychological connectedness* – to a future self shapes future thinking and decision-making processes beyond intertemporal trade-offs. In particular, how do people think about future events when anticipating intervening self-change? And what kind of attributes do individuals prioritise when the outcome of their choices will be experienced by a dissimilar future self?

Research in the present thesis used cross-sectional, experimental, and qualitative approaches to examine relationships between psychological connectedness, future thinking processes, and judgement and decision-making. Chapter 2 (two studies) indicated that lower self-reported psychological connectedness was associated with an increased tendency to analyse what future events expressed about self-identity, and greater use of third-person mental imagery, where the self is visible within an imagined event, as though seen from the perspective of an outside observer. However, experimentally manipulating psychological connectedness by leading participants to anticipate change versus stability in identity-relevant characteristics did not influence outcomes in either study. Research in Chapter 3 (four studies) revealed potential downstream effects of an increased focus on identity-expressiveness, with individuals attaching higher importance to future decision attributes that conveyed a desirable self-image when anticipating intervening self-change between making a choice and experiencing the outcome. Chapter 4 (one

study) aimed to establish rich insight into how individuals think about their future self and its link to present identity during a major life transition: starting university. First-year undergraduate students wrote a postcard to their graduating future self and completed measures of psychological connectedness. Content analysis of postcards indicated that while students often hoped for change and self-growth during their time at university, there were also ways in which they appeared to seek continuity; either through a consciously expressed desire for identity-relevant characteristics to persist in a future self, or by drawing narrative connections between different life stages. Analysis of pronoun use in postcards also pointed to potential distinctions in how students' conceptualised feelings of being 'connected' and 'similar' to their future self. While previous research has often considered these items as capturing the same construct, results in Chapter 4 found contrasting associations for the two measures, with higher connectedness – but *lower* similarity – correlated with an increased tendency to refer to present and future selves collectively (e.g., "we", "us"), and a decreased tendency to use first-person singular (e.g., "I") pronouns. Finally, Chapter 5 (one study) tested the hypothesis that perspective-taking abilities would particularly contribute to future-oriented decisions when present and future selves were perceived as dissimilar. This hypothesis was not confirmed, though results provided novel evidence that higher psychological connectedness and perspective-taking abilities were selectively associated with an increased tendency to make future-oriented monetary choices among participants who considered themselves to be higher on the socioeconomic ladder.

Overall, findings contribute to a greater understanding of how psychological connectedness relates to future thinking and decision-making processes. This thesis has potential implications for organisations and professionals seeking to shape or support individual decision-making and well-being during periods of significant personal change, such as life transitions.

Associated Publications

Fletcher, D., Houghton, R., & Spence, A. (2024). Approaching future rewards or waiting for them to arrive: Spatial representations of time and intertemporal choice. *PLoS ONE*, *19*(4). https://doi.org/10.1371/journal.pone.0301781 (Related work not directly reported in thesis)

Fletcher, D., Spence, A., & Houghton, R. (2023). Thinking about your future self: Do better perspective-takers make more patient decisions? *Personality and Individual Differences*, *212*. https://doi.org/10.1016/j.paid.2023.112281 (Chapter 5)

Fletcher, D., Spence, A., & Houghton, R. (2024). What will it be like, or what will I be like? Increased focus on identity implications of future events when anticipating intervening self-change. [under review]. (Chapter 2)

Fletcher, D., Spence, A., & Houghton, R. (2024). Decisions for a future self: Attributes with desirable identity implications considered more important when individuals anticipate intervening self-change [under review]. (Chapter 3)

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List of Abbreviations

BIF – behavioural identification form

CLT = construal level theory

EFT = episodic future thinking

DIDS = dimensions of identity development scale

fMRI = functional magnetic resonance imaging

IRI = interpersonal reactivity index

OSF = open science framework

SCC = self-concept clarity

SES = socioeconomic status

TMS = transcranial magnetic stimulation

TPJ = temporoparietal junction

Chapter 1 – Introduction and Literature Review

1.1. Introduction

Just as we sometimes feel like a different person now compared to what we were like in the past, we may also imagine becoming a different person in the future. For instance, a shy first-year student may envisage a more confident graduate future self transformed by their experiences at university, while a professional athlete may feel like a core part of their identity will be lost when they retire. Inspired by Derek Parfit's (1971, 1984) philosophical arguments about how much one should rationally care about their future selves, a growing body of empirical evidence suggests that people are less inclined to incur costs in the present when they feel dissimilar to the person they expect to be in the future (see Hershfield & Bartels, 2018, for a review). This expected similarity or overlap between present and future selves is referred to as *psychological connectedness* (Parfit, 1984; Bartels & Rips, 2010).

While researchers have made progress in establishing effects of psychological connectedness on future-oriented behaviour and decision-making across multiple domains, including personal health, finance, and education (Hershfield & Bartels, 2018), there has been relatively little empirical focus on how it shapes underlying processes involved in thinking about the future. In other words, how do people think about future events when they expect them to be experienced by a dissimilar future self? This is important because a large portion of our mental life is dedicated to anticipating possible future experiences (D'Argembeau et al., 2011), supporting a range of functions, including decision making and goal setting (Hallford & D'Argembeau, 2022). Furthermore, future events can be thought about in different ways, with significant consequences for motivation, judgement, and evaluation

(Trope & Liberman, 2010). For example, someone may have a more favourable perception of their upcoming marathon when they think about the larger meaning of why they are doing it, rather than the physical discomfort they may experience during the event itself.

In this thesis, I employ experimental, correlational, and qualitative methods to examine how future self-relevant events and outcomes are mentally represented and evaluated when individuals anticipate intervening self-change. Drawing upon construal level theory (CLT; Trope & Liberman, 2010) and research into identity construction and maintenance processes (e.g., Habermas & Bluck, 2000; Vignoles et al., 2006), I proposed that lower psychological connectedness would be associated with an increased focus on broader meaning and self-identity (vs. immediate experience) when imagining future events, with potential downstream consequences for how individuals prioritise different attributes in decisions made for future selves. Furthermore, based on evidence that thinking about future selves shares similarities with thinking about another person at a cognitive and neural level (Pronin & Ross, 2006; Ersner-Hershfield et al., 2009b), I examine the role of social-cognitive processes (e.g., perspective-taking) in thinking about and making decisions for a dissimilar future self. Evidence of engagement of such social-cognitive processes may point to interventions and manipulations that could be used to promote concern for future selves during periods of anticipated self-change.

1.2. Philosophical Background to Psychological Connectedness

In his seminal book *Reasons and Persons*, Derek Parfit (1984) proposed a reductionist account of personal identity, arguing that whether an individual is the same person over time is a matter of degree, dependent upon *connectedness* and *continuity* in their psychological properties, such as intentions, memories, beliefs, personality, and values. Parfit described psychological connectedness as the number of direct connections in psychological properties between the present self and a past or future self. Psychological connectedness generally diminishes over temporal distance. For instance, while my future self tomorrow morning is likely to share my current ambitions, personality, values, intentions, and memories to a very high degree, I can reasonably anticipate much less overlap with my future self in 30 years' time.

Psychological continuity instead refers to overlapping chains of high connectedness between selves. For example, while my present self shares limited overlap in psychological properties with my five year-old past self, I have very high connectedness with the person I was yesterday, and the person I was yesterday has very high connectedness with who I was the day before this, and so on, stretching all the way back to my five-year-old past self. Based on Parfit's conceptualisation, continuity – unlike connectedness – is therefore retained despite even substantial changes in the self over time.

Parfit (1984) argued that connectedness between present and future selves has important implications for how much we are rationally required to care about future selves from a self-interested perspective. For example, many of us likely believe that spending our retirement savings on frivolous purchases would undermine our own interests, since we may suffer considerably from these choices later in life. However, according to Parfit, such actions can be considered more or less rational depending on the degree of connectedness in psychological properties between present and future selves. If I expect my retired future self to share very few of the psychological properties that make me who I am today, it may not be irrational for me to fritter away my retirement savings on things that provide some pleasure in the present and a much greater cost in the future, since the person that bears these future costs will no longer be *me* to any significant extent.

1.2.1. Psychological Connectedness: Key Empirical Findings

My interest here is not with the merit of Parfit's normative claims, which have been influential - but controversial - in philosophy (see Dancy, 1997[1]). Instead, my focus is on empirical research that has examined whether there is any descriptive basis to Parfit's claims. That is, are future selves sometimes represented in a similar way to other people at a cognitive and neural level, and does this impact individuals' propensity to engage in future-oriented behaviours?

1.2.2. Mental Representations of Future Selves and Others

On Parfit's (1984) view of personal identity, there is no special divide between the self and others, only varying degrees of overlap in psychological properties. If this view holds descriptively, cognitive and neural processes underpinning representations of dissimilar future selves should somewhat resemble those involved in thinking about another person. Direct examination of how psychological connectedness shapes cognitive self-representations is limited, but related work has shown that thinking about temporally distant future selves shares similarities with thinking about another person. In research by Pronin and Ross (2006), participants made trait judgements about their present self, another person, or their future self in five years. Participants were presented with pairs of opposing trait adjectives (e.g., quiet vs. talkative), and asked to circle which best described the target person, or to

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[1] In *Reading Parfit*, Dancy (1997) presents a collection of essays evaluating Parfit's (1984) arguments in *Reasons and Persons*. For example, Brink (1997) points out that since continuity is typically retained over time, it is only Parfit's form of reductionism, which requires both continuity *and* connectedness, that justifies unequal concern for present and future selves. Brink argues that Parfit does not articulate a convincing reason for why continuity alone does not provide a sufficient basis for persistence of personal identity over time.

indicate that it varied across situations. Results showed that while participants viewed their present characteristics as largely context-dependent, they more frequently ascribed dispositional traits to future selves and others (also see Wakslak et al., 2008). Furthermore, Pronin and Ross (2006, Study 4) found that participants were more likely to imagine temporally distant vs. proximal future events using third-person mental imagery – picturing their future self from the outside as though viewed from the perspective of another person (also see D'Argembeau & Van der Linden, 2004; Hamilton & Cole, 2017). Neuroimaging research is also consistent with the idea that representations of temporally distant future selves can resemble thinking about a different person. Using functional magnetic resonance imagining (fMRI), Ersner-Hershfield et al. (2009b) had participants judge the applicability of various trait adjectives to their present self, their future self in ten years, and to another person. Results showed lower neural activity in brain regions associated with self-referential processing for both future vs. current self and other vs. self judgements (also see Mitchell et al., 2011).

1.2.3. Future-Oriented Behaviour and Decision-Making

Numerous studies have used self-report and experimental approaches to examine associations between psychological connectedness and future-oriented decision-making. A number of these studies have explicitly examined intertemporal trade-offs, which refer to decisions where the possible outcomes are realised at different points in time (e.g., Frederick et al., 2002). The requirement to make such trade-offs is commonplace in everyday decision-making, like whether to revise for next month's exam or binge on Netflix, or to buy an expensive car or save the money for retirement. People frequently have difficulty making future-oriented choices in these scenarios, in large part because rewards are subjectively perceived as less attractive and costs as less aversive when they will occur further into the future – a phenomenon referred to as temporal or delay discounting (e.g., Lempert & Phelps, 2016). Lab measures of intertemporal decision-making often involve (real or hypothetical) monetary choices in which participants select between a smaller reward today (e.g., £50) and a larger reward at some point in the future (e.g., £70 in 6 months). A decreased preference for future rewards reflects higher temporal discounting (i.e., greater impatience).

From Parfit's (1984) perspective, even a strong tendency to discount the value of future rewards is rationally justifiable for individuals who expect their future self to share few of their present psychological characteristics. Conversely, individuals who perceive a high degree of overlap between present and future selves should be more indifferent about the timing of costs and rewards.

The first empirical examination of this topic, by Frederick (2003), did not yield significant results. Operationalising Parfit's notion of psychological connectedness as expected similarity between present and future selves, Frederick asked participants to indicate how similar they felt to their future self in 5, 10, 20, 30, and 40 years on a 0-100 numerical scale, Participants then indicated what amount of money at each of these delays would be as good as receiving $100 today - with larger values reflecting higher temporal discounting. Contrary to expectations, psychological connectedness was not significantly correlated with temporal discounting across any of the temporal intervals.

However, later research, using a different measurement instrument to capture perceived similarity to a future self, did find significant associations with future-oriented decision-making. Ersner-Hershfield et al. (2009a, Study 1) had participants report perceived similarity to their future self using a modified version of Aron et al.’s (1992) inclusion of other in self (IOS) measure of interpersonal closeness, which is a pictorial scale consisting of seven pairs of increasingly overlapping circles, ranging from no overlap to near complete overlap. In Ersner-Hershfield et al.’s (2009a, Study 1) study, participants were asked to select the pair of circles (labelled ‘Current Self’ and Future Self’) that best reflected how similar they felt to their future self in ten years. Examining associations with intertemporal decision-making, Ersner-Hershfield et al. found that higher similarity was associated with lower temporal discounting (i.e., an increased preference for future rewards) in a hypothetical monetary choice task. Ersner-Hersfield et al. (2009a) labelled their future self-similarity item as a measure of *future self-continuity*. I will return to Ersner-Hershfield et al.’s use of *future self-continuity* rather than *psychological connectedness* (*c.f.* Frederick, 2003; Bartels & Urminsky, 2011) in Section 1.3.

Building on Ersner-Hershfield et al.’s (2009a) correlational findings, Bartels and Urminsky (2011, Study 1) provided causal evidence for an effect of psychological connectedness on intertemporal decision-making. In a between-groups manipulation, undergraduate participants who were due to graduate in the next two weeks were randomly assigned to one of two experimental conditions. In a high-connectedness condition, participants read that previous research has shown that core identity is fixed from an early age and highly stable over time. In a low-connectedness condition, participants read that an individual’s core identity often changes significantly in the period shortly after graduation. Participants were then asked to indicate their preference between receiving a $120 gift voucher next week (i.e., before graduation), or an amount ranging from $120 to $240 a year from now (i.e., after graduation). Evidencing a causal effect of psychological connectedness, participants in the low-connectedness condition, who were led to anticipate significant self-change after graduation, were more likely to opt to receive the earlier reward. Bartels and Urminsky (2011, Study 2) replicated these findings in a second study, using a sample of young adults (aged 18-29), with the psychological connectedness manipulation text referring to potential change or stability in young adulthood more generally rather than after graduation.

Neuroimaging research also provides converging evidence for an association between psychological connectedness and intertemporal decision-making. As described in the previous sub-section, Ersner-Hershfield et al. (2009b) observed reduced neural activity in brain regions associated with self-referential processing when participants thought about a future vs. present self. However, there were also substantial individual differences in the degree of neural differentiation between present and future self-representations. When participants completed an intertemporal choice task a week after scanning, Ersner-Hershfield et al. found that those who had distinguished more in their neural representations of present and future selves displayed increased discounting of future rewards (also see Mitchell et al., 2011, Study 2). Interpreting a larger disparity in neural activity as indicative of lower perceived similarity to a future self, Ersner-Hershfield et al. (2009b) concluded that – consistent with Parfit’s normative arguments - people are less inclined to sacrifice immediate rewards for the benefit of a dissimilar future self.

Consistent with findings using lab-based monetary decision tasks, a number of studies have shown that higher perceived similarity to a future self is associated with behavioural outcomes relating to intertemporal trade-offs, including the accumulation of more financial savings (Ersner-Hershfield et al., 2009a, Study 3), higher academic achievement (Adelman et al., 2017; Bixter et al., 2020), and greater engagement in health-related behaviours (Rutchick et al., 2018, Study 1; Pozolotina & Olsen, 2019; Lopez et al., 2023).

However, some contradictory findings have also been reported. Peetz and Wilson (2013, Studies 4-6) found that when an intervening *temporal landmark* (e.g., Christmas Day) was made salient, participants reported greater perceived dissimilarity to their future self, and an increased motivation to engage in health-improvement behaviours. Peetz and Wilson posit that when present and future selves are separated by a salient temporal landmark, they are assigned to separate mental categories. This prompts a focus on comparative differences rather than similarities between selves, based on the idea that people are more likely to contrast between targets belonging to different categories and assimilate those belonging to the same category (Schwarz & Bless, 2007). Peetz and Wilson suggest that this focus on dissimilarities highlights the gap between the present self and a desired future self, triggering self-improvement processes to reduce this discrepancy (Carver & Scheier, 1982; Oettingen, 2000).

1.3. Definitional Issues and Measurement

1.3.1. Psychological Connectedness vs. Future Self-Continuity

As mentioned in Section 1.2.3, Ersner-Hershfield et al. (2009a) labelled their single-item future self-similarity scale as a measure of "future self-continuity". Unfortunately, this term has also been used in several other ways, contributing to a lack of clarity in the literature. Firstly, recall that Parfit (1984) described connectedness as the holding of *direct* connections in psychological properties between the present self and a past or future self, and continuity as overlapping chains of high connectedness between selves. Perceived dissimilarity to a future self in ten years, as measured by Ersner-Hershfield et al. (2009a), does not imply a lack of continuity by Parfit's definition, since one may anticipate changes occurring progressively over time, meaning the self each day is highly connected to the self the day before. Ersner-Hershfield et al.'s (2009a) measure therefore seems closer to Parfit's notion of connectedness rather than continuity.

Secondly, the term future self-continuity has also been used to describe a multidimensional construct, consisting of perceived similarity, vividness, and positiveness sub-dimensions (Hershfield, 2011; Sokol & Serper, 2020). The issue with this conceptualisation of future self-continuity, as Bixter et al. (2020) point out, is that positiveness and vividness seem conceptually distinct from continuity. For instance, an individual may feel entirely continuous with either a negative or positive future self, and could potentially have a vivid representation of a future self that feels disconnected from present identity. Moreover, similarity, vividness, and positiveness components show differing associations with certain outcomes (Bixter et al., 2020; Sokol & Serper, 2020). For example, Bixter et al. (2020) found that greater similarity – but not vividness or positiveness – was associated with higher academic achievement. Failing to distinguish between similarity, vividness, and positiveness may therefore obscure important differences between measures.

Thirdly, self-continuity has been used elsewhere – particularly in research examining the intersection between identity and autobiographical memory - to describe a subjectively felt connection between past, present, and future selves that may persist despite self-change (Vignoles et al., 2006; Prebble et al., 2013; Sedikides et al., 2015; Habermas & Köber, 2015). This conceptualisation emphasises that while stability provides one basis for self-continuity, self-continuity can also be maintained through the development of autobiographical narratives that provide a causally coherent story of how and why the self has changed over time (Habermas & Bluck, 2000; McAdams, 2001; Chandler et al., 2003; Habermas & Köber, 2015; Becker et al., 2018). For example, I may feel like I was very different as a person three years ago, but see these changes as a response to other autobiographical experiences – like doing a PhD – therefore providing a causally coherent explanation of how I became who I am today.

To differentiate between terms, in this thesis I define *psychological connectedness* as the extent to which important psychological properties of the present self (e.g., personality, beliefs, ambitions, values) are expected to persist in a particular future self (Parfit, 1984; Bartels & Rips, 2010; Urminsky & Bartels, 2019). This has frequently been operationalised in psychological research as perceived similarity or overlap between present and future selves (Frederick, 2003; Bartels & Urminsky, 2011). I use the term *self-continuity* to instead describe a broader subjective connection between past, present, and future selves that can be maintained despite self-change (Vignoles et al., 2006; Sedikides et al., 2023).

1.3.2. What is Meant by Similarity to a Future Self?

In the preceding section I mentioned that psychological connectedness can be operationalised as perceived similarity to a future self. However, the word 'similarity' needs to be clarified, since it could potentially be conceptualised and measured in different ways. One possible approach would be to have participants rate present and future selves on specific traits and characteristics (e.g., wise, reliable, selfish), with agreement between ratings taken as an index of similarity. A second approach is to have participants indicate anticipated similarity to their future self on general traits and characteristics (e.g., personality, values, beliefs). An index of overall similarity can then be computed as a composite of similarity rating across items (Sokol & Serper, 2020). A third approach, used in the majority of psychological connectedness research (see Oyserman & Horowitz, 2023, for a review), is to elicit a 'global' judgement of perceived similarity or overlap between present and future selves - typically using the overlapping circles scale described in Section 1.2.3 (e.g., Ersner-Hershfield et al., 2009a; Bartels & Urminsky, 2011). Despite the simplicity of this latter approach, single-item global measures have shown good test-retest reliability (Ersner-Hershfield et al., 2009a), and have the advantage of allowing individuals to determine for themselves what changes in traits and characteristics would be most disruptive to their sense of similarity to a future self (Urminsky & Bartels, 2019; Bixter et al., 2020; Chen & Urminsky, 2022).

1.3.3. Similarity and Connectedness Measures

Instead of – or in addition to – asking participants to rate perceived similarity to a future self, some psychological connectedness measures ask participants to indicate the degree of connectedness they feel to their future self. For example, Bartels and Urminsky (2011) asked participants to think about the important characteristics that made them the person they are now, and to indicate the "degree of connectedness" they felt to their future self on an overlapping circles scale. While it does not seem obvious that laypersons would naturally interpret "connectedness" as perceived similarity or overlap with a future self, Bartels and Urminsky (2011, Study 5) found that connectedness ratings on the overlapping circles scale closely corresponded with perceived similarity ratings given on a 0-100 numerical scale. It is possible that a similarity/overlap interpretation of future self-connectedness is encouraged by the pictorial scale, which depicts varying degrees of overlap between present and future selves. Given the apparent correspondence between connectedness (assessed using the overlapping circles task) and perceived similarity, researchers have often combined the two items into a single scale (e.g., Bryan & Hershfield, 2012; Adelman et al., 2017; Bixter et al., 2020; see Oyserman & Horowitz, 2023, for a review).

However, some studies have hinted at potential distinctions between connectedness and similarity. In particular, recent research has shown that higher connectedness - but lower similarity - was associated with an intention to smoke less (amongst current smokers) and a greater tendency to act upon self-improvement goals (Zhao et al., 2022; Ganschow et al., 2024). In this thesis, I initially conceptualised connectedness and similarity as tapping into the same psychological connectedness construct, following previous research (e.g., Bartels & Urminsky, 2011; Bryan & Hershfield, 2012; Adelman et al., 2017). However, in some of my studies, a combined measure of connectedness and similarity did not have high internal reliability, and the two items occasionally had inconsistent associations with other measures (e.g., attribute importance ratings, pronoun use). Based on these emerging findings and recent studies by other researchers (e.g., Ganschow et al., 2024), I discuss potential distinctions between connectedness and similarity where relevant throughout the thesis.

1.3.4. Psychological Connectedness Associations with Related Constructs

As discussed in Section 1.3.1, I distinguish between psychological connectedness (i.e., perceived similarity to a future self) and self-continuity - a subjectively felt connection between past, present, and future selves that can persist despite self-change (e.g., Vignoles et al., 2006; Sedikides et al., 2023). A four-item scale has been developed which aims to assess this broader concept of self-continuity (e.g., "I feel connected to who I will be in the future"), with wording tailored to capture either past-present (Sedikides et al., 2015) or present-future continuity (Hong et al., 2024). It is notable that some of the items in the self-continuity scale use the word "connected", similar to measures purporting to capture psychological connectedness (Bartels & Urminsky, 2011). However, key differences between the measures are that the self-continuity scale items (1) utilise Likert-style response scale rather than the overlapping circles task and (2) refer to the future (or past) more broadly, rather than the future self at a particular point in time (e.g., 'person in a year', Bartels & Urminsky, 2011). Assuming that psychological connectedness and self-continuity measures capture their intended constructs, they should be positively correlated – but not so highly as to suggest they are indistinguishable. Although, to my knowledge, no previous studies have examined the association between self-continuity and psychological connectedness to a future self, research has shown moderate positive within-person correlations between the perceived stability of specific identity elements (i.e., particular traits, characteristics, or social identities) and the extent to which these identity elements are seen as contributing to a sense of self-continuity (Becker et al., 2018; Hong et al., 2021).

Another measure that seems conceptually related – though distinct - from psychological connectedness is self-concept clarity (SCC; Campbell et al., 1996). SCC refers to the extent to which an individual views their self-concept as clearly defined, internally consistent, and stable (Campbell et al., 1996). The stability component of SCC seems to capture something different than what is meant by psychological connectedness, reflecting day-to-day fluctuations in self-perception (e.g., "My beliefs about myself seem to change very frequently"; Campell et al., 1996) rather than perceived similarity between selves belonging to distinct temporal periods. Nonetheless, SCC could be expected to correlate with psychological connectedness, since the perception of day-to-day changes and inconsistencies in the self-concept may preclude a more enduring sense of stability over time (Jiang et al., 2020). Results have indeed shown weak to moderate positive associations between psychological connectedness measures and SCC (Szabó, 2022; Chu & Lowery, 2024).

Varying degrees of psychological connectedness to a future self could also be expected to relate to different stages or statuses in identity formation. Based on Erikson’s (1968) influential theory of identity construction, Marcia (1966) operationalised four distinct statuses in identity development: achievement (commitment to an identity after exploration of alternatives), foreclosure (commitment without prior exploration), diffusion (lack of commitment or exploration of possible identities), and moratorium (exploring possible identities) (also see Luyckx et al., 2008). It is possible that individuals who have made commitments regarding important identity aspects (i.e., achievement and foreclosure statuses) may anticipate less future self-change than individuals who have yet to make such commitments and are still exploring (i.e., moratorium). While, to my knowledge, associations between identity status and psychological connectedness have not been examined, the moratorium status is correlated with lower self-concept clarity (Ickes et al., 2012).

In addition to the self-identity-related measures discussed above, psychological connectedness to a future self may also be related to an individual’s tendency to think about or focus on the future more broadly. Consistent with this idea, psychological connectedness has consistently shown weak to moderate positive correlations with Strathman et al.’s (1994) consideration of future consequences scale (Hershfield et al., 2012; Adelman et al., 2017; Pozolotina & Olsen, 2019; Sokol & Serper, 2020; Lopez et al., 2023), and the future-orientation sub-scale of

Zimbardo's (Zimbardo & Boyd, 1999) time-perspective inventory (Sokol & Serper, 2020).

1.4. Predictors and Experimental Manipulations

1.4.1. Individual-Level and Contextual Predictors

Psychological connectedness is predicted by certain individual-level characteristics, including age, socioeconomic status, and cultural background. Research has shown that psychological connectedness is positively correlated with age (Hershfield, 2011; Rutt & Löckenhoff, 2016), a finding that is perhaps attributable to a higher frequency of life transitions and objective changes in personality traits, beliefs, and values during young adulthood (Habermas & Köber, 2015; see Löckenhoff & Rutt, 2017, for a review). Lower psychological connectedness is predicted by a lower socioeconomic status (SES), as assessed using both objective (i.e., income, education) and subjective status measures (Antonoplis & Chen, 2021). Antonoplis and Chen (2021) suggest this may be due to greater instability in life circumstances among lower SES individuals. Regarding cultural background, research by Ji et al. (2019, Study 4) found that Chinese participants reported higher psychological connectedness to their future self a year from now compared to Canadian participants. This relationship appeared to be mediated by cross-cultural differences in perceived temporal distance and psychological connectedness to past selves. Specifically, Chinese felt more temporally proximal to their past self, and this was associated with lower perceived change between the self a year ago and the self now, and the expectation of less change over the forthcoming year.

Beyond individual-level characteristics, psychological connectedness may also be influenced by contextual factors. In particular, researchers have posited that people are likely to experience lower psychological connectedness to their future self when they are approaching – or have recently experienced - a major life transition, like starting university, becoming a parent, or getting married (Bartels & Rips, 2010; Urminsky & Bartels, 2019; Szabó, 2022). This idea is consistent with Peetz and Wilson's (2013) findings that salient intervening temporal landmarks serve to increase perceived dissimilarity between present and future selves by influencing mental categorisation processes (see Section 1.2.3). Additionally, wider evidence has shown that life transitions disrupt both self-continuity (Habermas & Köber, 2015; see Sedikides et al., 2023) and self-concept clarity (Light & Visser, 2013) – perhaps due to the loss or marginalisation of identity aspects that were central to one's self-image in the past (Iyer et al., 2009), or the anticipation that new identity aspects will come to define the self in the future (Manzi et al., 2010).

1.4.2. Experimental Manipulations

The most widely used psychological connectedness manipulation, developed by Bartels and Urminsky (2011), asks participants to read a passage of text claiming that research has shown that identity-relevant characteristics typically remain highly stable (high connectedness) or change significantly (low connectedness) throughout young adulthood. The logic of this manipulation is that participants who are led to believe that personal change is common should be expected to then anticipate greater self-change themselves. Note that this is very similar to a manipulation of *implicit theory* – which refers to whether an individual holds the belief that peoples' psychological traits (e.g., intelligence, personality) are generally fixed or can be changed (Dweck., 1999). Similar to Bartels and Urminsky's (2011) task, some implicit theory manipulations present participants with a passage of text reporting psychological research supporting the view that personality is either fixed or malleable (Chiu et al., 1997).

Bartels and Urminsky's (2011) manipulation has been found to successfully influence psychological connectedness in a number of previous studies, usually between the present self and the future self in a year (Bartels & Urminsky, 2011, Studies 1-2; Bartels et al., 2013, Study 3; Bartels & Urminsky, 2015, Studies 3-5; Sheldon & Fishbach, 2015). Researchers have also sometimes added an additional component to the manipulation, in which participants are asked to list some of their own traits and characteristics that might change or remain stable into future (Hershfield et al., 2012; Schanbacher et al., 2021; Schanbacher et al., 2024). The addition of this writing task has the potential advantage of prompting more elaborate consideration of personal change or stability, rather than general beliefs about the malleability of psychological properties (*c.f.* Chiu et al., 1997). Another extension to the text-based manipulation, developed by Bartels and Urminsky (2011, Studies 3-4), asks participants to rate how easily they think it would be to generate either two (high connectedness) or ten (low connectedness) reasons their identity-relevant characteristics will remain stable into the future. Bartels and Urminsky's (2011) argue that participants should expect to easily generate two reasons, but are likely to anticipate much greater difficulty thinking of ten reasons, with this difficulty interpreted as a sign that present identity might not remain stable. This task has been successfully used in conjunction with the text-based manipulation (Bartels et al., 2013, Study 2; Bartels & Urminsky, 2015, Study 7), and also as a standalone manipulation (Bartels & Urminsky, 2011, Studies 3-4).

As discussed in Section 1.2.3, experimentally increasing the salience of intervening temporal landmarks (e.g., a birthday, Christmas Day) has also been found to decrease psychological connectedness to a future self, assessed using both an overlapping circles connectedness measure and a 0-100 similarity rating measure (Peetz & Wilson, 2013). This manipulation appears to influence psychological connectedness across even relatively short temporal intervals of six months or even just seven weeks (Peetz & Wilson, 2013). While a growing body of research has examined the motivational and behavioural consequences of anticipating temporal landmarks (see Dai & Li, 2019, for a review), no studies aside from Peetz and Wilson (2013) have (to my knowledge) examined the impact on psychological connectedness measures, so evidence for its effectiveness in this domain is less well-established than for Bartels and Urminsky's (2011) trait-stability manipulations. Furthermore, it is important to emphasise that Peetz and Wilson's (2013) task is not a direct manipulation of psychological connectedness. Instead, it manipulates the salience of a temporal landmark, which is posited to have downstream effects on psychological connectedness via mental categorisation processes. The distinction is important since the manipulation could potentially impact processes and constructs aside from psychological connectedness, meaning any effects would need to be mediated by psychological connectedness to provide strong evidence that it was a causally important mechanism.

In related work, researchers have attempted to increase future-oriented behaviour through interventions designed to enhance the vividness of future self-representations. In addition to focusing on vividness rather than perceived similarity, these interventions differ from the manipulations discussed above in that they typically include a control condition rather than a condition designed to make the future self feel more distant (i.e., there is usually no equivalent of a low-connectedness condition). Since observing significant effects therefore requires that vividness is sufficiently low at baseline, these interventions often relate to far more temporally distant future selves than trait-stability and temporal landmark manipulations.

In one vividness intervention study, young adult participants allocated more of a hypothetical cash windfall to their retirement savings after first viewing an age-progressed digital representation of their 70-year-old future self in a virtual reality environment, compared to participants in a control condition who had seen a different participant's age-progressed future self (Hershfield et al., 2011, Study 2). Similarly, van Gelder et al. (2013, Study 2) had young adult participants interact with either a digitally aged representation of their 40-year old future self (experimental condition), or their present self (control condition), in a virtual reality environment. Participants in the experimental vs. control condition were subsequently less likely to cheat in a trivia quiz for financial reward in an experiment. van Gelder et al. (2013) posit that future self-vividness leads individuals to attach greater concern to future interests, therefore offsetting the temptation for immediate, ill-gotten gains. However, this argument does not seem entirely convincing, as it is difficult to imagine that participants would conceptualise a clear link between cheating for a small financial reward (€7) in the present and an impact on their future self 15-20 years later.

Another type of intervention purporting to strengthen future self-vividness is a letter-writing task, in which participants write to a temporally distant future self. In one study, van Gelder et al. (2013, Study 1) had young adult participants write a letter to themselves either three months (near future condition) or 20 years (distant future condition) into the future, and then respond to a series of hypothetical delinquent decision scenarios (e.g., engaging in insurance fraud). Participants who had written a letter to their distant (vs. proximal) future self reported lower intentions for delinquent behaviour, which van Gelder et al. (2013) again posited was driven by increased vividness of the future self. Additionally, using the same letter-writing manipulation as van Gelder et al. (2013), Rutchick et al. (2018, Study 2) found that participants who had written to a temporally distant future self reported engaging in more exercise over the subsequent days. However, note that while perceived vividness (van Gelder et al., 2013) and self-continuity (Rutchick et al., 2018) were posited as underlying mechanisms for the observed effects, this was not tested in either study.

1.5. Gaps in Current Literature and Focus of the Present Thesis

Research to date has established a fairly substantial evidence base for a relationship between psychological connectedness and future-oriented behaviour and decision-making – assessed using both lab-based tasks and real-world behavioural outcomes, and correlational, experimental, and neuroimaging methods. However, the relationship between psychological connectedness and processes involved in thinking about and making decisions for the future has received limited empirical attention. In other words, how do people think differently about future events and outcomes when they expect them to be experienced by a dissimilar future self? Answers to this question may contribute to a more complete theoretical understanding of the emerging construct of psychological connectedness, with potential implications for judgement and decision-making processes – as I shall elaborate throughout the remainder of this section.

In this thesis, I examine two main ways in which psychological connectedness may shape future thinking and decision processes: (1) level of mental representation (i.e., focus on high-level meaning and self-identity vs. concrete details) and (2) engagement of social-cognitive processes, such as perspective-taking. In Section 1.5.1, I make the argument that when anticipating intervening self-change, people may be more likely to focus on the broader meaning of future events and what they express about self-identity, rather than concrete details relating to direct experience. Building on this hypothesised effect on mental representations, I then suggest that individuals may assign higher importance to future decision attributes which align with high-level goals and values, or which express something desirable about self-identity, when they feel dissimilar to their possible future self. In Section 1.5.2, I then consider evidence that thinking about and making decisions for a future self may be supported by social-cognitive processes, such as perspective-taking. I argue that such processes may particularly support concern for future selves that are perceived as dissimilar to the present self, and therefore – to some degree - cognitively represented as a different person.

1.5.1. Mental Representations of Future Events

1.5.1.1. Construal Level Theory

We spend a significant amount of time thinking about the future (Anderson & McDaniel, 2019), supporting a range of important functions, including goal-setting, decision-making, and self-control (Schacter et al., 2017; Hallford & D'Argembeau, 2022; Rösch et al., 2022). Envisioning future events and outcomes, as well as remembering the past, or imagining somebody else's perspective, require us to form mental representations that are decoupled from our immediate perceptual experience in the present (e.g., Buckner & Carroll, 2007). According to construal level theory (CLT), the nature of these mental representations differs according to the *psychological distance* of the event from the self in the here-and-now (Trope & Liberman, 2010). Specifically, CLT posits that events are increasingly represented by their high-level meaning or significance (abstract construal), rather than rich, contextual details relating to direct experience (concrete construal), when they are further away in time or space, less likely to happen, or being experienced by someone dissimilar to the self (Trope & Liberman, 2010).

A large body of evidence is consistent with the idea that increased psychological distance is associated with more abstract mental representations (see Soderberg et al., 2015, for a meta-analysis). For example, people are more likely to describe activities (e.g., "taking an exam") by their broader purpose and the goals or intentions of the actor (e.g., "showing one's knowledge"), rather than specific details or processes (e.g., "answering questions"), when activities are imagined happening further into the future, or being performed by someone dissimilar to the self (Liberman & Trope, 1998; Liviatan et al., 2008; Sánchez et al., 2021). Similarly, remembering events in the more distant past or imagining events in the more distant future is associated with a less elaborate sense of reliving or "pre-experiencing" concrete details, feelings, and emotions relating to direct experience (D'Argembeau & Van der Linden, 2004; Berntsen & Bohn, 2010).

Since CLT considers the self in the here-and-now as the reference-point from which events can be distanced (Trope & Liberman, 2010), any reduction in perceived similarity between the present self and another agent experiencing an event appears to imply an increase in psychological distance (see Maglio, 2020). This suggests that, like experiences of dissimilar others, representations of events relating to dissimilar future selves may be characterised by an increased focus on broader meaning versus concrete details relating to direct experience.

The limited research relevant to this suggestion so far has yielded inconclusive results. In two pretests (n = 110 and n = 73) of a psychological connectedness manipulation, Bartels and Urminsky (2011) did not observe between-group differences in preference for concrete or abstract descriptions of activities using the behavioural identification form measure (BIF; Vallacher & Wegner, 1989). However, in addition to the relatively small sample sizes used, the standard version of the BIF asks participants to think about general activities (e.g., "locking a door") without reference to the self or the timing of the activity, and may therefore not reflect how individuals represent their own future experiences.

Partly consistent with an effect of psychological connectedness on level of mental representation, McCue et al. (2019) found that adolescent participants who felt less similar to their future self reported fewer concrete details (e.g., perceptual details, thoughts, feelings, emotions) in their written narrative of imagined future autobiographical experiences. Conversely, psychological connectedness was not correlated with participants' self-reported feelings of pre-experiencing. This is contrary to effects of temporal distance, whereby events further away in time elicit a decreased sense of pre-experiencing (e.g., D'Argembeau & Van der Linden, 2004; Berntsen & Bohn, 2010). However, the non-significant relationship could perhaps be explained by a limitation of McCue et al.'s (2019) study, with participants reporting psychological connectedness to a future self in five years but reporting pre-experiencing in relation to events that would happen within the next year. It is possible that some participants felt they would be very different in five years but not at all different within the next year, perhaps attenuating associations between psychological connectedness and pre-experiencing.

In related research, though concerning representations of past rather than future selves, Libby and Eibach (2011a) asked undergraduate participants whether they felt they had changed or stayed the same since high school. Participants who felt they had changed were asked to recall a memory from high-school in which their actions were inconsistent with their present self-concept, while participants who felt they had not changed recalled a memory that was congruent with their present self-concept. Results showed that participants remembering a past event that was inconsistent (vs. consistent) with their present self-concept reported an increased focus on broader autobiographical meaning (e.g., an event's connection to important life themes and what it expressed about self-identity), rather than reliving the concrete thoughts, perceptions, and emotions they had experienced at the time. Events involving a dissimilar past self were also more likely to be remembered from a third-person visual perspective, which is posited to promote a 'top-down' understanding of events through integration with broader conceptual self-knowledge; in contrast to first-person mental imagery, which is thought to generate a 'bottom-up' understanding based on perceptions, feelings, and emotions relating to concrete details of the pictured scenario (Libby et al., 2009; Libby & Eibach, 2011b; Niese et al., 2022).

Libby and Eibach's (2011a) findings are compatible with a construal level explanation, with experiences of a dissimilar past self perhaps perceived as more psychologically distant, therefore prompting abstract vs. concrete mental representations. However, this is not the mechanism proposed by Libby and Eibach (2011a), who instead argue that individuals focus on broader autobiographical meaning when thinking of a dissimilar past self in an attempt to restore coherence or continuity in self-identity.

1.5.1.2. Self-Continuity Motive

This idea that individuals are motivated to maintain a stable and consistent self-concept is well-established in psychological research and theory (e.g., Swann & Read, 1981; Sedikides & Strube, 1997). This motive for self-coherence applies not only to how individuals see themselves in the present, but to their overall sense of continuity in identity over time (e.g., Vignoles et al., 2006). Research has shown that individuals view identity elements (e.g., personal traits and characteristics, group memberships, relationships) that contribute to perceived continuity in identity as more central to their overall self-concept (Vignoles et al., 2006), while hoping to gain future identities that will bolster self-continuity, and fearing future identities that threaten to disrupt it (Vignoles et al., 2008).

Self-continuity can be maintained through perceived stability in personal traits and characteristics (i.e., high psychological connectedness). For example, if I remember having always had the same beliefs, values, personality characteristics, and so on, I have a strong basis for viewing my identity as continuous over time. However, perceived stability is not the only potential source of self-continuity. People can also develop overarching narratives about their lives through *autobiographical reasoning* - a form of self-reflective thinking that involves establishing meaningful links between past events, lifetime periods, and traits and characteristics of the self (Habermas & Bluck, 2000; Chandler et al., 2003). Autobiographical reasoning allows individuals to develop overarching narratives about their lives, weaving together their past, present, and expected future selves into a coherent life story (McAdams, 2001). These narratives can provide a sense of continuity by accounting for how and why the self has changed over time; for instance, due to developmental trajectories (e.g., becoming wiser with age), or as a response to other autobiographical experiences (e.g., 'Having a child really changed me') (Habermas & Bluck, 2000; Pasupathi et al., 2007).

It has been suggested that autobiographical reasoning and life narratives may act as a compensatory mechanism which bolsters self-continuity during periods of change

(Habermas & Köber, 2015). Some support for this idea was found in a study by Habermas and Köber (2015). Participants were asked to narrate the story of their lives, and to then indicate how many transitional events (e.g., change of job, end or beginning of a romantic relationship) they had experienced in the last four years, and report perceived continuity with their past self (e.g., "When I think back to how I was four years ago, it feels a little unfamiliar"). Researchers transcribed participants' narratives and coded them for instances of autobiographical reasoning, such as attributing changes in personality to past events. Results showed that more frequent life transitions predicted lower self-continuity, but this association was attenuated amongst participants who made more autobiographical arguments, suggesting a possible buffering effect of this form of self-reflective thinking.

Returning to Libby and Eibach's (2011a) findings described earlier in this section, these authors posited that an increased focus on broader autobiographical meaning (vs. reliving immediate experience) when remembering events involving a dissimilar past self may reflect a compensatory strategy to restore self-continuity when it is threatened by salient perceptions of self-change. Specifically, Libby and Eibach argued that reflecting on high-level meaning and wider identity relevance may help individuals contextualise self-change within a broader narrative framework, such as developmental progression (e.g., 'I was just a stupid kid'), or turning points (e.g., 'I was a mess before I met my wife'). As reflections on broader autobiographical meaning do not relate to immediate subjective experience of the remembered event, such a focus requires the remembering individual to mentally step outside of reliving the thoughts, feelings, and emotions they had experienced at the time (e.g., Cox & McAdams, 2019).

While Libby and Eibach's (2011a) findings relate to mental representations of past events, remembering the past and imagining the future share overlapping cognitive and neural processes (D'Argembeau & Van der Linden, 2004; Addis et al., 2007; Botzung et al., 2008), perhaps reflecting a common network underpinning *mental time travel* in both temporal directions (Suddendorf & Corballis, 1997). Furthermore, people appear to be motivated not only to maintain a sense of continuity with their past selves, but with their future selves as well (Vignoles et al., 2008; Sedikides et al., 2023). It is therefore plausible that the anticipation of *future* self-change would also promote a compensatory shift to focusing on broader meaning vs. concrete details. For example, a first-time expecting parent may expect a significant transformation in their goals, values, and priorities to take place after their child is born. Extending Libby and Eibach's (2011a) rationale, imagining events involving this future self may elicit a sense of inconsistency with the present self-concept, prompting a focus on broader meaning and self-identity, rather than specific details, thoughts, feelings, and emotions relating to direct experience.

1.5.1.3. Exploring and Evaluating Possible Future Identities

Despite similarities between remembering the past and imagining the future, an important asymmetry is that the latter can be shaped by present behaviour. For instance, someone may decide against the idea of having a child altogether after imagining an unhappy future self that laments the loss of freedom. Hallford and D'Argembeau (2022) found that imagining future selves is a commonly reported reason people think about the future, perhaps allowing individuals to mentally explore possible identities that are not yet in existence, meaning they can be revised or discarded and approached or avoided based on their desirability (Markus & Nurius, 1986). It seems likely that people would be more concerned with the desirability of possible future selves during periods of anticipated self-change, compared to when a future self is expected to closely resemble the present self. In such cases, rather than mentally stepping into the shoes of a future self to pre-experience the event itself, people may focus more on analysing and evaluating the future self in the event. This may be facilitated by use of third-person mental imagery, allowing individuals to picture themselves as they would be seen by others. Indeed, previous research has shown that remembering past events from a third-person visual perspective is associated with an increased tendency to analyse what one's behaviour in an event expresses about their traits and characteristics (Frank & Gilovich, 1989). Furthermore, since the broader meaning or significance of an event conveys more identity-relevant information (e.g., goals and intentions) than its concrete details (Vallacher & Wegner, 1987), individuals may focus more on these high-level features in their mental representations when motivated to explore possible future identities.

1.5.1.4. Potential Implications for Decision-Making Processes

If psychological connectedness influences how future events are mentally represented, it may shape judgement and decision-making beyond the relative prioritisation of present vs. future outcomes that has been the primary focus of empirical research on this topic so far (Urminsky & Bartels, 2019). In particular, a focus on broader meaning and self-identity rather than concrete details may lead individuals to assign higher relative importance to future decision attributes which align with high-level values or which express something desirable about self-identity.

These predictions are consistent with evidence in the CLT literature that finds that outcomes which align with broader goals or values, but involve certain concrete costs, are evaluated more positively when they are more psychologically distant (see

Trope & Liberman, 2010, for a review). For example, Trope and Liberman (2000) found that actions which were consistent with high-level goals but expected to be somewhat unenjoyable at the time (e.g., a student studying in the library for an important assignment) were evaluated more positively when imagined happening a year from now rather than tomorrow. Furthermore, decisions relating to the distant future or a dissimilar other tend to be based on the desirability of an outcome (e.g. whether a guest lecture will be interesting), while decisions relating to the near future or a similar other tend to be based on more practical considerations (e.g., whether the lecture is at a convenient time) (Liberman & Trope, 1998; Liviatan et al., 2008). Similarly, people tend to assign higher importance to identity-relevant attributes (i.e., attributes which express desirable self-characteristics) rather than practical considerations when making decisions for a temporally distant future self (Kivetz & Tyler, 2007), or for another person (vs. the self) (Danziger et al., 2012). Converging evidence also comes from research on temporal landmarks. Hennecke and Converse (2017, Study 2) found that individuals are more likely to plan to start a healthy diet when it is made salient that the start date is the first day of a new month – an effect which appeared to be partly driven by decreased focus on potential practical barriers to healthy eating. Although not measured by Hennecke and Converse, research by Peetz and Wilson (2013) discussed in Section 1.2.3 indicated that salient temporal landmarks decrease perceived similarity between present and future selves. Hennecke and Converse's findings could therefore potentially be explained by the future self being perceived as more dissimilar (and therefore psychologically distant) when an intervening temporal landmark is made salient, thus decreasing focus on concrete details and processes, in accordance with CLT.

Aside from a focus on broader meaning (vs. concrete details) of the event itself, I have also suggested in this section that when individuals anticipate intervening self-change, the future self may become a more prominent focus in mental representations of future events. If this is the case, individuals may attach higher importance to future decision attributes that express something desirable about self-identity when they perceive their present and future selves as dissimilar. For instance, consider an undergraduate student deciding between possible graduate jobs. One job offers practical benefits, like flexible working hours and a short commute, but is at a company known for unethical and exploitative manufacturing processes. The other job involves difficult hours and a long commute, but the role offers the opportunity to have a positive impact on society. If this student feels dissimilar to the person they will be after graduating from university, might their job preference be shifted toward the role with more desirable identity implications?

1.5.1.5. Section Summary

To summarise the argument in this section, evidence suggests that people focus more on the broader meaning of events (i.e.., their overall' gist', purpose, and goals or intentions of the actors) that are more psychologically distant from the here-and-now (Trope & Liberman, 2010). Since the present self is the reference-point from which events can be distanced, a less similar future self can be considered more psychologically distant than a similar future self (Maglio, 2020), perhaps resulting in an association between lower psychological connectedness and increased focus on broader meaning vs. concrete details of future events. Furthermore, people are motivated to maintain a sense of continuity in their identity (e.g., Vignoles et al., 2006), and to orient their behaviour towards attainment of desired future selves (Markus & Nurius, 1986). These motives may lead people to focus on the broader autobiographical meaning of envisaged events and what they express about self-identity during periods of anticipated self-change, with the potential downstream effect of increasing perceived importance of future decision attributes which align with high-level values or express desirable qualities about the self.

From a CLT perspective, one potential objection to my arguments is that temporally distant events may already be perceived as psychologically distant, meaning perceived dissimilarity to a future self may have a limited incremental impact on mental representations. However, while I have mainly framed my arguments in terms of low connectedness increasing psychological distance, the reverse also applies: higher connectedness should decrease psychological distance. In other words, while future events at a particular temporal distance (e.g., in 5 years) may generally be perceived as fairly distant, they may be less so – and therefore more concretely represented - for individuals who feel especially similar or connected to their future self. Nonetheless, it does seem likely that the proposed effects of psychological connectedness on future event-representations may be difficult to detect at very long temporal distances. For instance, some research discussed in Section 1.4.2 considered future selves 20 or more years into the future (e.g., Hershfield et al., 2011; van Gelder et al., 2013). Such remote points in time seem likely to elicit highly abstract mental representations, perhaps regardless of psychological connectedness. In this thesis I therefore primarily focus on temporal distances of a year or two, which have commonly been used in psychological connectedness manipulations (Bartels & Urminsky, 2011; Bartels et al., 2013 Sheldon & Fishbach, 2015; Schanbacher et al., 2024).

1.5.2. Psychological Connectedness and Social-Cognitive Processes

The underlying assumption of why low psychological connectedness decreases future-oriented behaviour is that future outcomes that will be experienced by a dissimilar future self are perceived in some way as less self-relevant, and therefore attributed a lower subjective value (Ersner-Hershfield et al., 2009b; Hershfield, 2011). However, as Bryan and Hershfield (2012) point out, people do not always act only in their own self-interests – often incurring costs to themselves for the benefit of others (e.g., Miller & Ratner, 1998; Fehr & Fischbacher, 2003). Moreover, people can often be more compassionate towards other people than they are towards themselves (Neff, 2023). For example, I may berate myself for being "stupid" when I make a mistake, while showing kindness and understanding towards a friend or colleague making the same mistake.

A wealth of neuroimaging research indicates that other-oriented decisions are supported by social-cognitive processes, such as perspective-taking, which is the capacity to infer and mentally represent what others are thinking, feeling, or seeing (Frith & Frith, 2006). In particular, making unselfish decisions, like sharing larger amounts of a monetary reward with another person, is associated with increased neural activity (Strombach et al., 2015; Hutcherson et al., 2015; Tusche et al., 2016; Soutschek et al., 2016; Langenbach et al., 2022) and grey matter volume (Morishima et al., 2012) in the temporoparietal junction (TPJ), which is a brain region closely linked with perspective-taking of others (e.g., Saxe & Kanwisher, 2013).

If a psychologically distant future self is in some ways cognitively represented as another person (e.g., Pronin & Ross, 2006; Ersner-Hershfield et al., 2009b), might perspective-taking abilities also contribute to decisions which benefit the future self at the expense of the present self? Consistent with such a possibility, neuroimaging evidence has found that the TPJ is also involved in making future-oriented decisions in intertemporal choice scenarios (O'Connell et al., 2015, 2018; Hill et al., 2017; Soutschek et al., 2016, 2020; Pehlivanova et al., 2018; Krönke et al., 2021). Establishing causal evidence for this effect, Soutschek et al. (2016) found that inhibitory transcranial magnetic stimulation (TMS) to the TPJ reduced preference for delayed monetary rewards in intertemporal choice tasks, increased selfishness in monetary allocations between the self and others, and impaired performance in a visual perspective-taking task which required participants to mentally represent a perspective that conflicted with their own.

It seems plausible that social-cognitive processes may particularly contribute to future-oriented decisions when people more strongly differentiate between present and future selves at a cognitive and neural level; that is, when a future self is perceived as more akin to an 'other' (Ersner-Hershfield et al., 2009b). Specifically, when a future self is perceived as very similar to the present self, future rewards are likely to be assigned a high subjective value by virtue of self-referential processing (Ersner-Hershfield et al., 2009b). Conversely, when a future self is perceived as highly dissimilar to the present self, future rewards may be attributed a much lower subjective value via reduced self-referential processing. However, in this latter case, as with making decisions which benefit others at a cost to the self, stronger perspective-taking abilities may facilitate future-oriented choice. Providing some support for this idea, inhibiting neural processing in the TPJ especially decreased willingness to forgo immediate rewards when the beneficiary was a more temporally (and therefore psychologically) distant future self (Soutschek et al., 2016). Examining the relationship between psychological connectedness and social-cognitive processes directly, Bryan and Hershfield (2012) had participants read a retirement savings appeal that was framed as either benefiting the self ("your long-term well-being is at stake"), or the future self as another person that the present self is morally responsible for ("your 'future self' is completely dependent on you"). Participants subsequently had the chance to adjust their own pension contribution rate, and then reported psychological connectedness, which was measured as a composite of future self-similarity and connectedness items measured on overlapping circles scales. Results showed that the future-self-as-other (vs. self-interest) framing increased retirement savings contributions among participants reporting high – but not low – psychological connectedness. These findings are consistent with the idea that social-cognitive processes may contribute to future-oriented decisions for the self, but suggest that inducing these processes may be more beneficial when present and future selves are perceived as *similar* rather than dissimilar, in apparent contradiction to the argument I am attempting to make. However, it is possible that individuals reporting low psychological connectedness to their retired future self already cognitively represented this self as a different person, meaning an experimental frame inducing a future-self-as-other perspective would be unlikely to have any further impact on mental representations or decision-making for these participants.

1.5.2.1. Potential Implications

Evidence that perspective-taking abilities can promote greater concern for psychologically distant future selves could suggest alternative approaches to strengthening future-orientation in contexts where individuals are likely to feel dissimilar to their future self (e.g., when anticipating or experiencing a major life transition, like starting university). For example, social-cognitive training interventions which improve perspective-taking abilities may positively impact future-oriented decision-making. Indeed, Valk et al. (2017) found that improvement in perspective-taking performance after a social-cognitive training programme correlated with cortical thickness increases in TPJ, which appears to be an important brain region for future-oriented choices during intertemporal trade-offs (e.g., Soutschek et al., 2016). Furthermore, there may be contexts in which inducing a sense of dissimilarity between present and future selves has beneficial impacts for mental well-being. For example, I may be more likely to resolve to treat myself kindly and refrain harmful self-criticism when I conceptualise my future self as a different person; based on idea that people can often be harsher or more critical towards themselves than they are towards other people (Neff, 2003, 2023).

1.5.2.2. Section Summary

In summary, evidence that thinking about distant future selves shares parallels with thinking about another person raises the possibility that social-cognitive processes, such as perspective-taking, could facilitate future-oriented decisions for the self. Consistent with this idea, future-oriented decisions in intertemporal choice scenarios are causally related to neural activity in a region of the brain (TPJ) involved in making prosocial decisions and representing the perspectives of others (Saxe & Kanwisher, 2013; Soutschek et al., 2016).

Theoretically, it seems plausible that perspective-taking processes may particularly contribute to future-oriented decisions when present and future selves are perceived as dissimilar, as this is case in which a future self may – to some degree – be conceptualised as a different person (Hershfield, 2011). There is presently limited research investigating this idea. Some evidence has shown that disrupting neural processing in TPJ particularly impairs future-oriented decisions when the beneficiary is a more temporally distant future self (Soutschek et al., 2016). However, Bryan and

Hershfield (2012) found that participants who felt similar (vs. dissimilar) to their future self were more influenced by a retirement savings appeal tapping into prosocial motivations by framing the future self as another person.

1.6. Overview of Thesis

The aims of this thesis were to examine relationships between psychological connectedness and (1) mental representations of future events (e.g., focus on broader meaning and self-identity vs. concrete details and immediate experience); (2) perceived importance of different attributes of future decision outcomes (e.g., identity-relevant vs. practical benefits), and (3) contribution of social-cognitive processes, such as perspective-taking, in thinking about and making decisions for the future.

These aims were addressed across four research chapters, consisting of eight studies in total. In the first of these empirical chapters (Chapter 2), I examined relationships between psychological connectedness and mental representations of future self-relevant events across two studies, using self-report and experimental measures. Psychological connectedness was measured using connectedness and similarity items, and manipulated using a task adapted from Bartels and Urminsky (2011), in which participants read and wrote about either future change (low connectedness) or stability (high connectedness) in their psychological traits and characteristics. Participants then imagined future events and completed measures relating to focus on broader meaning vs. concrete details, visual perspective in mental imagery, and tendency to analyse what future events expressed about self-identity.

Based on evidence from the first research chapter that lower psychological connectedness was associated with an increased focus on what future events expressed about self-identity, in Chapter 3 I tested the hypothesis that people would attach higher importance to future decision attributes which expressed something desirable about self-identity when anticipating intervening personal change. I tested this across four studies, with participants reporting psychological connectdness to a future self and rating the importance of various attributes of future decision outcomes, where half of the attributes related to concrete or practical benefits (e.g., staying in comfortable and modern accommodation while travelling), and the other half conveyed desirable qualities about the self (e.g., giving back to local communities while travelling).

In Chapter 4, I used a more open ended approach to establish richer insight into how people conceptualise their future self and its link to present identity during a major life transition that is often associated with significant personal change: starting university. First-year undergraduates in their first week completed psychological connectedness measures and wrote a postcard to their graduating future self. Content analysis of postcards was performed to identify key aspects of students' future self-representations, and associations with self-report measures were examined to explore how individual differences in psychological connectedness related to postcard content.

In Chapter 5, I considered the joint role of psychological connectedness and perspective-taking abilities in intertemporal decision-making. Participants completed a monetary intertemporal choice task, a cognitive-behavioural visual perspective-taking task, and self-report measures of perspective-taking and psychological connectedness. I expected perspective-taking abilities and psychological connectedness to both be associated with lower temporal discounting (i.e., increased preference for future rewards). Importantly for the aims of the present thesis, I also examined whether perspective-taking abilities more strongly predicted future-oriented decisions among individuals who felt less similar to their future self.

Chapter 2 –Mental Representations of Future Events

2.1. Introduction

Theoretical frameworks outlined in Section 1.5.1 converge on the idea that lower psychological connectedness to a future self would be associated with (1) decreased focus on direct experience, (2) increased focus on broader meaning and self-identity, and (3) increased use of third-person mental imagery when thinking about future self-relevant events. I explored these relationships across two studies, using experimental manipulations and self-report measures of psychological connectedness adapted from previous research (Ersner-Hershfield et al., 2009a; Bartels & Urminsky, 2011). Study 1 examined representations of future autobiographical experiences, with participants imagining plausible events in their personal future (D'Argembeau & Van der Linden, 2004), and reporting feelings of pre-experiencing, visual perspective, and focus on broader autobiographical meaning. Study 2 provided a list of general activities for undergraduate students to imagine performing after graduating from university (e.g., interviewing for a job), with key dependent variables capturing relative focus on broader meaning versus concrete details, perceived self-identity implications, and affective valence – as a possible downstream consequence of changes in level of representation.

2.1.1. Ethics

Ethics approval for the present research was obtained from the University of Nottingham School of Psychology Ethics Committee (ref. S1505). Participants provided online consent in each study.

2.1.2. Pre-Registration and Transparency

Hypotheses and planned analyses for both studies were preregistered with the Open Science Framework (OSF). Links to pre-registration forms, datasets, and analysis code are shown in Appendix A.

2.2. Study 1

Imagining events that might occur in our personal future, sometimes referred to as episodic future thinking (EFT), can involve varying degrees of pre-experiencing - a partial sense of mentally living specific details, feelings, and emotions that might arise if the envisaged event were actually being experienced in the present (Atance & O'Neil, 2001). EFT also typically involves mental imagery, where events are pictured from a first-person or third-person perspective, or a combination of the two (Rice & Rubin, 2009).

I hypothesised that lower psychological connectedness, whether self-reported or experimentally induced, would be associated with decreased pre-experiencing and greater dominance of third-person (vs. first-person) mental imagery in future thinking.

I also conducted exploratory analyses examining relationships between psychological connectedness and focus on broader autobiographical meaning, perceived insight into future internal experience, and online self-concept consistency. These measures were specified in pre-registration documentation as potential mediators[2] for relationships between psychological connectedness and pre-experiencing and visual perspective (see Appendix A). In particular, lower

[2] A fourth measure – *pre-experiencing mental states* - was also measured as a possible mediating variable (e.g., "While imagining this event, I experience the emotions I would feel during the event"; 1 = not at all; 7 = very much). This exploratory two-item scale was highly correlated with the overall pre-experiencing scale, $r(366) = .69$, $p < .001$, and therefore not analysed further.

psychological connectedness was expected to be associated with heightened focus on broader autobiographical meaning, with focus on autobiographical meaning in turn detracting from feelings of pre-experiencing and increasing use of third-person mental imagery. Lower psychological connectedness was expected to be associated with decreased perceived insight into future internal experience, based on the idea that people may be uncertain what it would be likely to subjectively experience a particular scenario from the perspective of a future self with different psychological characteristics to the present self (Paul, 2014; Hershfield & Bartels, 2018). Perceived insight was expected to be positively correlated with pre-experiencing. Lower psychological connectedness was also expected to be associated with decreased *online* self-concept consistency, which refers to the extent to which the self in a pictured event is perceived as congruent or incongruent with an individual's present self-image (Libby & Eibach, 2002). Online self-concept consistency was in turn expected to be positively correlated with pre-experiencing and use of first-person mental imagery (Libby & Eibach, 2002; 2011a).

2.2.1.Method

2.2.1.1. Participants and Statistical Power

Participants were young adults in the UK (aged 18-25). Target sample size was based on achieving statistical power of .80 to detect an effect of $d = 0.30$ in an independent samples t-test (two-tailed), where $\alpha = .05$. An *a priori* power calculation with these parameters was conducted in G*Power (Faul et al., 2007). This indicated a required sample of 352 participants, which was increased to 440 to account for potential exclusions. An effect size of at least $d = 0.30$ for the psychological connectedness manipulation on pre-experiencing and visual perspective was considered plausible based on previous research using similar measures and manipulations. Specifically, similar (though slightly larger) effect sizes have been observed in research comparing pre-experiencing for temporally distant versus proximal future events (D'Argembeau & Van der Linden, 2004), and visual perspective in memories involving dissimilar versus similar past selves (Libby & Eibach, 2011a). Furthermore, psychological connectedness manipulations have produced medium-sized effects on other theoretically relevant outcomes, such as intertemporal decision making (e.g., Bartels & Urminsky, 2011).

Data were collected from 440 participants, with a final sample of 368 after applying pre-registered exclusions for participants who failed to follow instructions of the psychological connectedness manipulation (n = 7) or future thinking task (n = 65), as further detailed in Section 2.2.2.1. The final sample had a mean age of 22.6 (*SD* = 1.94). 178 participants reported their gender as male, 185 as female, and 5 as non-binary/other.

2.2.1.2. Episodic Future Thinking Task

Participants completed an EFT task (D'Argembeau & Van der Linden, 2004) in which they imagined specific events they may personally experience one to three years from now. The minimum temporal distance of a year was chosen so that participants would imagine events occurring after the period of self-change (vs. stability) they had written about in the trait-stability manipulation task (see Section 2.2.1.4). I solicited events within a one to three year window as I believed it may be difficult for all participants to think of events they would experience exactly a year from now. Participants provided a brief description of their imagined event and then responded to questions assessing characteristics of that event. To increase reliability of measures, participants then repeated this process for a second event, with responses averaged across the two events to form composite measures.

Pre-Experiencing and Visual Perspective. Pre-experiencing (also referred to as autonoetic awareness) was measured using four items drawn from previous research (e.g., D'Argembeau & Van der Linden, 2006), with responses provided on a seven-point scale (1 = not at all to 7 = very much). An example item was, "While imagining this event, I feel that I am experiencing the situation as if I was there". Responses to the four items were averaged to form a composite pre-experiencing measure, with high internal consistency ($\alpha \geq .93$ for each event).

Visual perspective was measured using a single item (Rice & Rubin, 2009). Participants first read a short paragraph explaining visual perspective in future thinking (verbatim wording is reported in Appendix B) and were then asked, "For the event you are imagining, to what extent does it come to you as though you are an outside observer or as though you are seeing it through your own eyes?", with responses provided on a seven-point scale (1 = entirely through own eyes; 7 = entirely as an observer). Higher scores therefore reflect increased dominance of third-person mental imagery relative to first-person mental imagery.

Focus on Broader Autobiographical Meaning. Focus on broader autobiographical meaning was assessed using a four-item scale created for this study, based on Libby and Eibach's (2011a) conceptualisation. Two items measured the extent to which participants thought about the larger meaning of the event in their life (e.g., "I think about the broader meaning of this event in my life"), while the other two items measured a tendency to reflect on what the imagined scenario expressed about self-identity (e.g., "I think about what my behaviour in this event says about my personality"). Responses were provided on a seven-point scale (1 = not at all; 7 = very much), with higher scores indicating a greater focus on broader autobiographical meaning. The scale showed acceptable internal consistency (α ≥ .77 for each event).

Perceived Insight into Future Internal Experience. A novel three-item *perceived insight* measure (α ≥ .78 for each event) was administered, which asked participants to indicate the extent to which they felt they knew what they would be thinking and feeling during a future event (e.g., "It's difficult to know how I will feel during this event when it happens" [reverse scored]). Responses were provided on a five-point scale (1 = strongly disagree; 5 = strongly agree).

Online Self-Concept Consistency. A four-item *online self-concept consistency* scale (α ≥ .78 for each event), using measures adapted from Sutin and Robins (2007), aimed to measure the extent to which participants felt their behaviour and characteristics in an imagined event were consistent with their present self-concept (e.g., "My behaviour in this event is consistent with my current personality"). Responses were provided on a five-point scale (1 = strongly disagree; 5 = strongly agree).

Other EFT Measures. A number of other measures relating to future event representations were administered as possible covariates, including temporal distance ("If this event occurs, when do you expect it to happen?"; less than 6 months from now; 6-12 months from now, 1-2 years from now; 2-3 years from now; 3-5 years from now, over 5 years from now), vividness ("The overall vividness of this event in my mind is"; 1 = not at all vivid; 7 = very vivid), perceived importance ("This event involves an important theme or episode in my life"; 1 = not at all important; 7 = very important), perceived likelihood of the event occurring ("How strongly do you believe this event will happen?"; 1 = not at all strongly; 7 = very strongly), similarity to previously experienced events ("I have experienced the same or a very similar event in the past";1 = never; 7 =very often), and how often the event had been thought about ("I have thought about this event often before"; 1 = never; 7= very often).

2.2.1.3. Self-Reported Psychological Connectedness

Self-reported psychological connectedness was measured using two items from Bartels and Urminsky (2011). The first item presented participants with six pairs of increasingly overlapping circles labelled as 'Person now' and 'Person in a year'. Participants were asked to think about the important characteristics that made them the person they are now, and then to select the pair of circles that best reflected how connected they felt to their future self a year from now, where no overlap meant 'completely disconnected' and total overlap meant 'completed connected'. The overlapping circles measure of psychological connectedness has shown acceptable test-retest reliability (Ersner-Hershfield et al., 2009a) and correlated with future-oriented behaviours in a number of previous studies (e.g., Ersner-Hershfield et al., 2009a; Lopez et al., 2023). For the second item, participants indicated how similar they felt to their future self a year from now using a sliding scale from 0-100, where 0 meant 'completely different' and 100 meant 'exactly the same' (e.g., Bartels & Urminsky, 2011). Future self-connectedness and similarity measures are usually assumed to reflect the same construct and therefore combined into a single scale (e.g., Bixter et al., 2020; Lopez et al., 2023). Following this approach, I created a composite psychological connectedness scale ($\alpha = .79$) by taking the average of z-scores for future self-connectedness ($M = 4.16$, $SD = 0.97$) and similarity ($M = 68.32$, $SD = 18.79$) items (e.g., Bartels & Urminsky, 2011).

As an exploratory measure, participants also reported perceived similarity and (un)certainty regarding specific aspects of their identity (personality, values, goals, beliefs, and preferences) a year from now. Responses to similarity items (“ compared to right now, how different do you expect the followings things about yourself to be one year from now?”) were given on a seven-point scale from completely different (1) to exactly the same (7). Responses to uncertainty items (e.g., “I am uncertain as to what my personality will be like one year from now”) were provided on a five-point scale from strongly disagree (1) to strongly agree (5). Correlation analyses involving these measures are reported in Appendix C (Table 1).

2.2.1.4. Procedure

Participants were recruited through Prolific (https://www.prolific.co/) and paid £1.60 to participate in an online study entitled ‘Experiences of young adults’. After providing informed consent, participants were randomly assigned to one of two psychological connectedness conditions using the randomisation feature in Qualtrics. Based on Bartels and Urminsky’s (2011, Study 2) trait-stability manipulation, participants read that research has demonstrated that an individual’s important traits and characteristics are either stable throughout young adulthood (high connectedness), or likely to change significantly, even over the course of several months (low connectedness) (verbatim wording is reported in Appendix B). Subsequently, participants provided a brief summary of the text and described one or two of their own traits or characteristics that would be likely to remain the same (high connectedness) or change (low connectedness) over the next year (Schanbacher et al., 2024; Hong et al., 2024).

After the manipulation, participants completed the EFT task and measures, followed by the self-reported psychological connectedness measures.

2.2.2. Results

2.2.2.1. Exclusions

Based on pre-registered exclusion criteria, participants were excluded from all analyses if they reported either of their events as likely to happen within the next six months or more than five years from now (n = 64). I decided *a priori* to use this broader timeframe (vs. 1-3 years from now) for exclusions because a pilot study indicated a substantial proportion of participants dated at least one event outside of the task-specified window, even after trialling alternative task instructions. Importantly, the significance of results did not change when analyses were restricted to participants dating both events within the one to three year window (Appendix C, Table, 2). One additional participant was excluded for stating they were unable to imagine any specific future events they might experience, and a further seven participants were excluded for providing task-irrelevant responses to the psychological connectedness manipulation (e.g., simply listing their day-to-day activities). Exclusions did not significantly differ between groups (final sample sizes: high connectedness, n = 186; low connectedness, n = 182).

2.2.2.2. Content of Future Events

To give an indication of the type of events participants imagined, event descriptions were grouped into categories. The most commonly reported events related to (1) careers, such as starting or leaving a job (24%); (2) romantic relationships, like the beginning or end of a relationship or getting married (21%); (3) moving home or to a new geographical location (13%); (4) going on holiday or travelling (12%), and (5) education, like graduating from university (11%).

2.2.2.3. Effects of Psychological Connectedness Manipulation

The effects of the experimental manipulation on self-reported psychological connectedness and EFT variables were examined using independent samples t-tests (two-tailed). Test results, along with the cell means and standard deviations are reported in Table 2.1. Mean self-reported psychological connectedness was significantly lower among participants in the low (vs. high) connectedness condition. Additionally, participants in the low psychological connectedness condition reported lower online self-concept consistency, suggesting that they perceived their future self in an imagined event as less similar to their present self. The manipulation therefore appeared to successfully influence perceived similarity between present and future selves. However, contrary to my confirmatory hypotheses, there was no significant difference in either pre-experiencing or visual perspective ratings between experimental conditions (Table 2.1). Additionally, exploratory analysis indicated that focus on broader autobiographical meaning did not differ significantly between high and low connectedness conditions (Table 2.1).

Table 2.1

Means and standard deviations by high and low psychological connectedness experimental conditions

	High		Low				
Variables	***M***	***SD***	***M***	***SD***	***t*(366)**	***p***	***d* [95% CI]**
PC scale	0.12	0.87	-0.12	0.93	2.51	.013	0.26 [0.06, 0.47]
Pre-exp	4.46	1.33	4.48	1.30	-0.17	.866	-0.02 [-0.22, 0.19]
Visual perspective	3.68	1.67	3.60	1.54	0.44	.664	0.05 [-0.16, 0.25]
Broader meaning	4.51	1.12	4.66	1.07	-1.30	.195	-0.14 [-.34, .07]
Perceived insight	3.22	0.75	3.21	0.76	0.21	.837	0.02 [-0.18, 0.23]
Online SCC	3.45	0.73	3.20	0.68	3.38	<.001	0.35 [0.15, 0.56]

Note. PC = psychological connectedness; Pre-exp = pre-experiencing; Online SCC = online self-concept consistency.

Higher visual perspective scores indicate increased third-person vs. first-person mental imagery.

2.2.2.4. Psychological Connectedness Correlations with EFT Variables

Correlations between self-reported psychological connectedness and pre-experiencing and visual perspective are displayed in Table 2.2. Consistent with my pre-registered hypothesis, psychological connectedness was negatively correlated with visual perspective ratings, suggesting that participants reporting lower similarity to their future self increasingly imagined events from a third-person (vs. first-person) perspective. However, contrary to my hypothesis, the correlation with pre-experiencing was not significant.

Table 2.2

Zero-order correlations between episodic future thinking characteristics and self-reported psychological connectedness

	Psychological connectedness		
Variables	***r*(366)**	***p***	**95% CI**
Pre-experiencing	-.07	.193	[-.17, .03]
Visual perspective	-.16	.003	[-.26, -.06]
Broader meaning	-.16	.002	[-.26, -.06]
Perceived insight	.15	.003	[.05, .25]
Online SCC	.41	<.001	[.32, .49]

Note. Online SCC = online self-concept consistency.

Higher visual perspective scores indicate increased third-person vs. first-person mental imagery.

Consistent with expectations, psychological connectedness was also positively correlated with online self-concept consistency and perceived insight into future internal experience, and negatively correlated with focus on broader autobiographical meaning (Table 2.2). Since the novel broader autobiographical meaning scale included two items relating to a focus on the larger meaning of the event ($\alpha \geq .78$ for each event) and two items relating to a focus on what the event expressed about self-identity ($\alpha \geq .73$ for each event), I also probed relationships further by examining psychological connectedness correlations separately for these subscales. The results showed that lower psychological connectedness was correlated with increased focus on self-identity, $r(366) = -.20$, $p < .001$, 95% CI [-.30, -.10], but not focus on the broader meaning of the event itself, $r(366) = -.08$, $p = .106$, 95% CI [-.19, .02].

Note that correlations reported in Table 2.2 were not significantly moderated by experimental condition, as indicated by the lack of significant interactions between measured and manipulated psychological connectedness in linear regression analyses on each of the dependent variables (Appendix C, Table 3). Additionally, significance of results did not change when controlling for various other EFT variables, including temporal distance, overall vividness, perceived importance, perceived likelihood of occurring, similarity to previously experienced events, and how often the event had been thought about before.

2.2.3. Discussion

Correlations in Study 1 were partially consistent with expectations, providing novel evidence that lower psychological connectedness to a future self is associated with greater dominance of third-person (vs. first-person) mental imagery, and an increased focus on broader autobiographical meaning during future thinking. Relationships mirror those found in research examining characteristics of autobiographical memories involving dissimilar (vs. similar) past selves (Libby & Eibach, 2011a), potentially pointing to a common underlying mechanism, such as perceptions of psychological distance (Trope & Liberman, 2010), or a motivation to maintain self-continuity (Libby & Eibach, 2011a).

Interestingly, further analysis of the broader autobiographical meaning scale indicated that lower psychological connectedness was specifically associated with higher scores on items reflecting a focus on analysing and evaluating the future self in the event, rather than the larger meaning or significance of the event itself. This focus on self-identity and use of third-person mental imagery, which has been linked with a tendency to interpret one's behaviour in terms of underlying traits and characteristics (Frank & Gilovich, 1989), may be driven by a motivation to mentally explore and evaluate possible future identities (Markus & Nurius, 1986) during periods of anticipated personal change. Additionally previous research has shown that people are more likely to make dispositional (rather than situational) attributions when thinking about a more temporally distant future self (Wakslak et al., 2008), perhaps suggesting that the association in the present research was underpinned by a broader relationship between psychological distance and focus on self-traits and characteristics.

In light of the significant relationships with visual perspective, focus on broader autobiographical meaning, and perceived insight into future internal experience, it is perhaps surprising that lower psychological connectedness was not also associated with diminished pre-experiencing – contrary to expectations. However, this pattern of results is not entirely incompatible with CLT, which posits only that mental representations become *relatively* more abstract at increased psychological distance. CLT does not specify that this should be driven by both an increased focus on broader meaning and a decreased focus on direct experience (Soderberg et al., 2015). Additionally, a strong sense of pre-experiencing requires that events are integrated with broader personal goals and expectations (D'Argembeau, 2020). It is therefore possible that any detriment to pre-experiencing caused by a decreased focus on direct experience or lower perceived insight into future internal experience was offset by greater integration of the event with wider self-knowledge.

Importantly, while the experimental manipulation appeared to successfully influence psychological connectedness, it did not produce expected effects on visual perspective, pre-experiencing, or focus on broader autobiographical meaning. A possible reason for this is that some participants in the low-connectedness condition may have found the manipulation – which suggests important traits and characteristics are likely to change over the course of a few months – implausible, with the small effect on self-reported psychological connectedness potentially attributable to demand characteristics. However, contrary to this explanation, previous studies using the same manipulation text have found theoretically expected effects (e.g., Bartels & Urminsky, 2011; Sheldon & Fishbach, 2015).

Another possible reason for the discrepancy between correlational and experimental effects is that the causal direction of the relationships may be the opposite to what I had theorised. For example, it may be that visualising future events from a third-person perspective decreases perceived similarity between present and future selves. However, others have argued against this idea, suggesting that third-person mental imagery could equally be expected to *increase* psychological connectedness for some individuals, by highlighting similarities in traits and characteristics of the self over time (McCarroll & Cosentino, 2020).

Additionally, it is possible that correlations between psychological connectedness and EFT characteristics were underpinned by joint associations with another, unmeasured construct. One potentially relevant construct is self-concept clarity (SCC), which refers to the degree to which an individual's self-concept is confidently defined, stable and internally consistent (Campbell et al., 1996). Low SCC could potentially undermine psychological connectedness to a future self (Jiang et al., 2020) as the perception of day-to-day changes and inconsistencies in the self-concept seems to preclude a more enduring sense of stability. Furthermore, low SCC could also perhaps increase focus on self-identity and use of third-person mental imagery in an attempt to establish a positive future self-image when the current self-concept is perceived as uncertain or malleable (see Dixon & Mikolon, 2021).

Study 2 aimed to provide a stronger manipulation of psychological connectedness by tying anticipated change to a future life transition: graduating from university. Furthermore, a task adapted from prior CLT research was administered to more directly examine relative focus on broader meaning versus concrete details of events, and SCC was measured as a potential covariate.

2.3. Study 2

In Study 2, I measured and manipulated psychological connectedness to a graduate future self among current undergraduate students. I believed that the context of a life transition may increase the effectiveness of the psychological connectedness manipulation, since leaving university often involves changes in group memberships, social circles, and roles and responsibilities – which may make the likelihood of significant personal change seem more plausible. Additionally, reflecting on similarities between present and future selves in the high-connectedness condition may help to bridge any pre-existing sense of disconnect caused by anticipation of the upcoming transition.

To examine effects of psychological connectedness on mental representations of future self-relevant events, participants imagined themselves performing a series of activities in the summer after graduating from university (e.g., attending a job interview, travelling abroad) and indicated the extent to which they thought about each activity in terms of its high-level meaning or its concrete details, using measures adapted from previous research in the CLT literature (Liberman & Trope, 1998; Liviatan et al., 2008; Carrera et al., 2020). I hypothesised that relative focus on the broader meaning of an activity (i.e., its overall purpose or significance, rather than specific details or processes) would be higher among participants in the low (vs. high) psychological connectedness condition. Furthermore, based on preliminary findings in Study 1 that lower psychological connectedness was specifically associated with an increased focus on what future events expressed about the self, rather than event meaning *per se*, in Study 2 I separately measured the extent to which participants believed that future activities would convey something about self-identity (e.g., personality traits and values). I pre-registered the exploratory hypotheses that lower psychological connectedness (manipulated or measured) would be associated with higher perceived identity-expressiveness of activities.

Additionally, previous research suggests that representations of events are often more positively valenced at increased psychological distance, particularly when the event's broader meaning is more desirable than its concrete details (Trope & Liberman, 2000; Wesp et al., 2009). For example, Trope and Liberman (2000) found that actions which aligned with broader goals or values but involved certain concrete costs (e.g., studying in the library for an important assignment), were viewed more positively when imagined happening a year from now rather than tomorrow. Activities in Study 2 (see Table 2.3) were expected to be associated with a more positive broader meaning than concrete details. For example, 'travelling to another country' may be construed as going away to relax or explore the world (broader meaning), or as rushing around the airport and sitting on a cramped plane (concrete details). Based on the expectation that lower psychological connectedness would increase focus on broader meaning relative to concrete details, I hypothesised that perceptions of future activities would be more positively valenced in the low (vs. high) psychological connectedness condition.

2.3.1.Method

2.3.1.1. Participants and Statistical Power

Participants were young adult undergraduates in the UK, in their third or fourth year of university. I initially aimed to recruit 360 participants, based on a statistical power calculation in G*Power (Faul et al., 2007), assuming a between-groups effect size of $f = 0.16$, $\alpha = .05$, and power of .80 in a 2 x 6 mixed ANOVA (using the "as in Cohen 1988 - recommended" option in G*Power, Lakens, 2013). This indicated a required sample size of 310 participants – which was increased to 360 to allow for possible exclusions. An assumed effect size of $f = 0.16$ for the effect of psychological connectedness on relative focus on broader meaning and affective valence was consistent with the correlation between psychological connectedness and focus on broader autobiographical meaning found in Study 1 ($r = .16$), and substantially smaller than effects of psychological distance on abstraction (Hedges' g = 0.48) and evaluation and behaviour (Hedges' g = 0.53) observed in meta-analyses by Soderberg et al. (2015).

Data collection began on 22 January 2024. I pre-registered an intention to stop data collection when the target sample size was reached, or on 3 March 2024 if the target sample had not been reached by this time. Data collection was stopped on 3 March, by which time 309 participants had been recruited. The final sample size was 279 after excluding participants for incorrectly responding to an attention check question (n = 25), or failing to follow instructions of the psychological connectedness manipulation (n = 5), as further detailed in the results section. The final sample had a mean age of 21.6 ($SD = 1.30$), with 78 participants reporting their gender as male, 189 as female, and 12 as non-binary. The majority of participants anticipated they would graduate in the summer of 2024 (78%), 17% said 2025, and 5% said 2026 (including graduation year as a covariate did not impact any of the reported results).

Note that although the final sample was smaller than planned, sensitivity power analysis using G*Power (Faul et al., 2007) indicated that 279 participants still provided 80% power to detect effects as small as $f = 0.17$.

2.3.1.2. Future Activities Task

Participants were asked to imagine performing six different activities in the summer after graduating from university (participating in a charity race, donating blood, helping a friend move house, attending a job interview, going to the gym, travelling to another country). For each activity, participants completed measures of relative focus on broader meaning (vs. concrete details), affective valence, and perceived identity-expressiveness. Activities were intended to be plausible experiences for a range of young adults, and to be positively valenced in terms of high-level meaning but subject to potentially undesirable concrete features.

Relative Focus on Broader Meaning. Relative focus on broader meaning versus concrete details was measured with two items for each of the six activities. The first item was conceptually based on the BIF measure of construal level (Vallacher & Wegner, 1989; Trope & Liberman, 2010), but with interval rather than binary response scales (Carrera et al., 2020; Nguyen et al., 2023). The BIF asks participants to choose between two possible descriptions of activities, where one description reflects the broader meaning of *why* an activity might be performed and the other description reflects the concrete details of *how* the activity might be performed (Vallacher & Wegner, 1989). Participants in the present study were asked to imagine themselves performing a particular activity in the summer after graduating (e.g., donating blood) and indicated whether they felt it was best described by its meaning or purpose (helping to save lives), or specific details of what it might entail (having blood taken from your arm). Responses were provided on a seven-point scale, anchored by the broader meaning and concrete detail descriptions displayed in Table 2.3. Higher scores indicated a greater relative preference for describing the activity by its broader meaning.

Table 2.3

Activities and their concrete and abstract descriptions

	Activity description	
Activity	**Concrete details**	**Broader meaning**
Participating in a charity race	Running along the street	Supporting a worthy cause
Donating blood	Having blood taken from your arm	Helping to save lives
Helping a friend move house	Packing and carrying boxes	Being a good friend
Attending a job interview	Answering difficult questions	Advancing your career
Going to the gym	Using exercise equipment	Getting in shape
Travelling to another country	Getting on a plane	Seeing the world

A second item was administered to measure relative focus on broader meaning in a way that was not dependent upon participants endorsing the particular activity descriptions provided by the researchers (Nguyen et al., 2023). Participants were asked (for each of the six future activities), "When thinking about this activity, to what extent do you focus on the specific details (i.e., practical steps or processes) involved in performing the activity, or on the broader meaning (i.e., wider significance or purpose) of the activity?" Responses were given on a seven-point scale (1 = entirely focus on specific details; 7 = entirely focus on broader meaning). Averaging the two items across all six activities produced a composite 12-item measure with acceptable internal consistency (α = .74).

Affective Valence. Affective valence was assessed with four items, with participants indicating the extent to which they believed each activity was positive, desirable, unpleasant (reverse-scored), and enjoyable (Williams et al., 2014). Responses for each item were provided on a seven-point scale (1 = not at all, 7 = very much). Averaging responses across items for all activities produced a single scale with high internal consistency (α = .86).

Perceived Identity-Expressiveness. The extent to which participants believed particular future activities would express something about their identity was assessed with two questions based on Wakslak et al. (2008, Study 6). For example, "To what extent do you feel [activity] in the summer after graduating from university would say something about who you are as a person, such as your personality, goals, or values?" (1 = not at all say something about me as a person, 7 = very much say something about me as a person). For each activity, responses to the two items were combined into a single scale, where higher scores reflected greater perceived identity-expressiveness. Averaging responses across both items for all activities produced a 12-item scale with acceptable internal consistency (α = .78).

2.3.1.3. Self-Reported Psychological Connectedness

Self-reported psychological connectedness was measured using the same two items as Study 1, but with references to 'a year from now' replaced with 'after leaving university'. Future self-similarity (*M* = 63.25, *SD* = 19.41) and connectedness (*M* = 3.98, *SD* = 1.01) were again z-scored and combined into a single scale (α = .77).

2.3.1.4. Self-Concept Clarity

Campbell et al.'s (1996) 12-item measure of self-concept clarity was also included for possible use as a covariate. Example items are "My beliefs about myself seem to change very frequently" (reverse scored) and "In general, I have a clear sense of who I am and what I am." Responses to all 12 items were provided on a five-point scale from strongly disagree (1) to strongly agree (5). Items were combined into a single scale where higher scores indicate greater self-concept clarity (α = .90).

2.3.1.5. Implicit Theory of Change

For exploratory purposes, I administered Dweck's (1999) eight-item 'kind of person' scale to measure participants' lay beliefs about whether personal characteristics tended to be fixed or malleable (α = .91). Responses were provided on a six-point scale from strongly agree (1) to strongly disagree (6). Responses were recoded such that higher scores indicated a stronger belief that personal characteristics are fixed. An example item is, "People can always substantially change the kind of person they are." Correlations involving this measure are reported in Appendix C (Table 7).

2.3.1.6. Procedure

Participants were recruited through Prolific and paid £1.35 to participate in a short online study entitled 'Thinking about future experiences'. After providing informed consent, participants were randomly assigned to one of two psychological connectedness conditions using the randomisation feature in Qualtrics. Participants in the high-connectedness condition read that despite changes in day-to-day life and circumstances after leaving university, identity typically remains stable (e.g., "the weeks and months following graduation are sometimes considered a period of stability in identity, with people often reporting feeling like the same person compared to when they were at university”). Conversely, participants in the low-connectedness condition read that because of changes in day-to-day life and circumstances after leaving university, people typically experience changes in their identity (e.g., “the weeks and months following graduation are sometimes considered a transformative period in identity, with people often reporting feeling like a different person compared to when they were at university”). Participants were then asked to write about some important aspects of their identity that they expected to remain the same (high connectedness) or change (low connectedness) after leaving university. Verbatim wording is reported in Appendix B.

After the manipulation, all participants were asked the following attention check question: ‘Which of the following statements best describes what you were asked to write about in the previous task?’ Possible response options (presented in a random order) were: ‘How I may change after graduating from university’; ‘How I may stay the same after graduating from university’; ‘What I enjoy about university’, ‘What I don’t enjoy about university’. Participants were subsequently excluded for failing to provide the correct answer based on their experimental condition.

Participants were then informed that they would be asked to think about themselves participating in certain activities in the summer after graduating from university. The six future activities were presented to participants in randomised order. For each activity, participants responded to the relative focus on broader meaning items, followed by identity-expressiveness items, and then the affective valence items, before repeating these measures for the next activity.

After the future activities task, participants completed self-reported psychological connectedness, self-concept clarity, and implicit theory scales.

2.3.2. Results

2.3.2.1. Exclusions

Based on pre-registered exclusion criteria, participants were excluded from all analyses for providing a task-irrelevant response to the experimental manipulation (n = 5) or for failing the attention check question (n = 25). After exclusions, there were 279 participants (high connectedness condition: n = 130; low connectedness condition: n = 149). Pre-registered exclusions were also applied for specific analyses where participants did not respond to all items on a particular scale. On this basis, one participant was excluded from all analyses involving the relative focus on broader meaning measure and one participant was removed from all analyses involving the perceived identity-expressiveness measure.

Surprisingly, the 25 participants that failed the attention check question were all in the high connectedness condition. Since the first sentence of the manipulation text in both conditions mentioned *changes* in day-to-day life and circumstances after graduation, it is possible that (inattentive) participants in the low-connectedness condition who only read the beginning of the paragraph still correctly guessed that they had been asked to write about self-change. While this is potentially problematic for the assumption of between-groups equivalence in baseline characteristics of participants, adding back in these excluded participants did not change the significance of experimental effects.

2.3.2.2. Effects of Psychological Connectedness Manipulation

Manipulation Check. Independent samples t-tests (two-tailed) revealed that self-reported psychological connectedness was significantly lower for participants in the low connectedness condition (M = -0.11, SD = 0.91) compared to the high connectedness condition (M = 0.13, SD = 0.88), t(277) = 2.29, p = .023, d = 0.28, 95% CI [0.04, 0.51]. The manipulation therefore appeared to successfully influence psychological connectedness – but as in Study 1, the effect size was small. Note that SCC did not differ between the low (M = 3.10, SD = 0.87) and high (M = 2.98, SD = 0.81) connectedness conditions, t(277) = -1.19, p = .235, d = -0.14, 95% CI [-0.38, 0.09].

Relative Focus on Broader Meaning, and Affective Valence. 2 x 6 mixed ANOVAs were conducted on relative focus on broader meaning and affective valence, with experimental condition (high connectedness, low connectedness) as the between-subjects factor and activity type as the within-subjects factor. The ANOVA on relative focus on broader meaning revealed no significant difference between high-connectedness (M = 4.85, SE = 0.07) and low-connectedness conditions (M = 4.98, SE = 0.07), F(1, 276) = 1.67, p = .197, η_p^2 = .006. Of secondary interest, there was a main effect of activity type, indicating that participants thought about some activities in terms of their broader meaning (vs. concrete details) more than others (Appendix C, Table 9), F(5, 1380) = 20.60, p <.001, η_p^2 = .07. There was no significant interaction between experimental condition and activity type, F(5, 1380) = 1.24, p = .288, η_p^2 = .004.

The ANOVA on affective valence also revealed no significant difference between high-connectedness (M = 4.95, SE = 0.06) and low-connectedness conditions (M = 5.01, SE = 0.06), F(1, 277) = 0.56, p = .455, η_p^2 = .002. Of secondary interest, there was a main effect of activity type, indicating that participants viewed some activities more positively than others (Appendix C, Table 10), $F(5, 1385) = 174.88$, $p <.001$, $\eta_p^2 = .39$. There was no significant interaction between experimental condition and activity type, $F(5, 1385) = 0.44$, $p = .822$, $\eta_p^2 = .002$.

Perceived Identity-Expressiveness (Exploratory Analysis). A 2 x 6 mixed ANOVA on identity-expressiveness revealed no significant difference between high-connectedness ($M = 4.71$, $SE = 0.07$) and low-connectedness conditions ($M = 4.70$, $SE = 0.07$), $F(1, 276) = 0.02$, $p = .884$, $\eta_p^2 <.001$. The interaction between experimental condition and event type was also not significant, $F(5, 1380) = 0.41$, $p = .844$, $\eta_p^2 = .001$, with only a main effect of activity type, indicating that participants viewed some future events as more expressive of their identity than others, $F(5, 1380) = 11.89$, $p <.001$, $\eta_p^2 = .04$ (Appendix C, Table 11).

2.3.2.3. Correlations with Psychological Connectedness

Consistent with one of my pre-registered exploratory hypotheses, there was a significant negative correlation between self-reported psychological connectedness and perceived identity-expressiveness of future activities, indicating that participants who felt less similar to their future self were more likely to view future behaviours as expressing something about them as a person, $r(276) = -.14$, $p =.018$, 95% CI [-.26, -.03]. This relationship was not moderated by experimental condition ($b = -0.08$, $SE = 0.11$, $p = .474$) and correlations between psychological connectedness and perceived identity-expressiveness were consistent across activity type (Appendix C, Table 12). However, contrary to expectations, psychological connectedness was not correlated with relative focus on broader meaning or affective valence (Table 2.4).

Table 2.4

Correlations between psychological connectedness, SCC, and characteristics of future activity representations

Variables	1	2	3	4
1. PC scale	1			
2. SCC	.09	1		
3. Broader meaning	-.05	.29***	1	
4. Affective valence	-.06	.27***	.58***	1
5. Identity-expressiveness	-.14*	.18**	.55***	.58***

Note. PC = psychological connectedness; SCC = self-concept clarity.

All correlations are between-participants. Within-participant correlations between relative focus on broader meaning, affective valence, and identity-expressiveness are reported in Appendix C, Table 13.

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

Surprisingly, self-reported psychological connectedness was not significantly correlated with self-concept clarity (Table 2.4). However, correlations appeared to differ across experimental conditions, with greater SCC associated with higher psychological connectedness in the high connectedness condition, $r(128) = .26$, $p = .003$, 95% CI [.09, .41], but not the low connectedness condition, $r(147) = -.02$, $p = .782$, 95% CI [-.18, .14]. A multiple linear regression on self-reported psychological connectedness, with SCC, experimental condition, and their interaction, simultaneously entered as predictors confirmed that the effect of SCC was significantly moderated by experimental condition ($b = -0.30$, $SE = 0.13$, $p = .019$).

In contrast to psychological connectedness, self-concept clarity was *positively* correlated with perceived identity-expressiveness of future activities (Table 2.4). Multiple linear regression on perceived identity-expressiveness confirmed that SCC ($\beta = .19$, $p = .001$) and psychological connectedness ($\beta = -.16$, $p = .007$) had significant independent effects in opposing directions. SCC was also positively correlated with relative focus on broader meaning and affective valence (see Table 2.4).

2.3.3. Discussion

Consistent with one of my exploratory hypotheses, participants reporting lower psychological connectedness were more likely to believe their future actions would express something about them as a person, such as their personality traits and values. However, lower psychological connectedness was not associated with increased focus on broader meaning versus concrete details of future activities, or more positive affective valence - contrary to expectations. Although not entirely consistent with my hypotheses, this pattern of results in Study 2 is generally in line with Study 1, where lower psychological connectedness was associated with an increased focus on future self-identity but not broader meaning of the event itself. Furthermore, similar to Study 1, the experimental manipulation had a small but significant effect on self-reported psychological connectedness, but did not influence the tendency for participants to view future activities as expressive of self-identity, despite the significant correlation. I return to the absence of causal effects and the discrepancy between self-identity focus and broader meaning correlations across the two studies in the general discussion.

Extending results from Study 1, Study 2 also managed to rule out joint correlations with SCC as an explanation for the association between lower psychological connectedness and a tendency to analyse what future events expressed about self-identity. Indeed, in contrast to psychological connectedness, SCC was *positively* correlated with perceived identity-expressiveness of future actions - perhaps because a tendency to consider the identity implications of one's actions may contribute to a more clearly defined self-concept (Vallacher & Wegner, 1987). Additionally, attenuation of the correlation between SCC and self-reported psychological connectedness in the low-connectedness condition offers new insight into the relationship between these constructs. Specifically, while high SCC may contribute to increased psychological connectedness to a future self, this is perhaps diminished when an intervening event is expected to elicit self-change. In other words, in the presence of intervening life transitions or other change-eliciting events, individuals may have a highly consistent and stable current self-concept, while expecting to be a very different person in the future.

2.4. General Discussion

People sometimes imagine themselves being quite different in the future compared to what they are like now. But how does this perceived dissimilarity – or low psychological connectedness – between selves influence future thinking? Across two studies, I found that lower psychological connectedness to a future self was associated with an increased focus on what future events or actions would express about self-identity, but not a stronger tendency to think about future activities in terms of high-level meaning rather than specific details relating to direct experience. Specifically, participants reporting lower perceived similarity to a future self were more likely to analyse and evaluate what their behaviour in a future event would say about them as a person (Study 1), and to view future activities as expressing something about self-identity (Study 2). Conceptually related to this focus on self-identity and consistent with one of the pre-registered hypotheses, lower psychological connectedness was also associated with increased use of third-person mental imagery (Study 1), which may facilitate self-evaluation by enabling individuals to picture their future self from an observer's viewpoint (Frank & Gilovich, 1989; Niese et al., 2022). Conversely, lower psychological connectedness was not associated with reduced feelings of pre-experiencing (i.e., imagining an event as though being directly experienced) (Study 1), or increased emphasis on broader meaning versus concrete details in representations of future self-relevant activities (Study 2). Additionally, despite significant correlations with self-reported psychological connectedness, measures relating to self-identity focus and visual perspective were not influenced by experimental manipulations of psychological connectedness.

2.4.1. Focus on Self-Identity and Broader Meaning

While it is important to avoid making strong claims based on the absence of significant effects, it is interesting to consider why lower psychological connectedness may have been associated with an increased focus on self-identity, but not with focus on broader meaning versus concrete details. This discrepancy is puzzling, since mechanisms that could explain a focus on future self-identity also seem to predict increased focus on high-level meaning. In particular, if dissimilar future selves are perceived as more psychologically distant, this could account for an increased tendency to think about future behaviours in terms of what they express about self-identity (Wakslak et al., 2008), but would also be expected to increase relative focus on broader meaning (Liviatan et al., 2008). Additionally, motives to maintain self-coherence (Libby & Eibach, 2011a) or explore and evaluate possible future selves (Markus & Nurius, 1986) would seem to predict an increased tendency to represent future activities by their core meaning or purpose, since this conveys more information about the actor (e.g., goals, intentions) than concrete details and processes relating to direct experience (Vallacher & Wegner, 1987).

It is possible that the absence of an effect on relative focus on broader meaning can be explained by previous evidence suggesting that psychological distance on one dimension reduces sensitivity to psychological distance on a second dimension (Maglio et al., 2013). This means that events which are months or years away may already be considered psychologically distant, with perceived dissimilarity to the future self therefore having minimal incremental distancing effect. If this is the case, effects of psychological connectedness on relative focus on broader meaning versus concrete details may often be rather small, if they exist at all. However, effects could potentially be larger for more proximal events. For example, an individual facing a transformative life event tomorrow may construe future events taking place next week far more abstractly than they would in the absence of such an intervening transition.

2.4.2. Absence of Experimental Effects

There are several possible explanations for why the psychological connectedness manipulation did not influence focus on self-identity or visual perspective, despite significant correlations. One possibility is that focusing on self-identity when imagining future events decreases psychological connectedness, in contrast to the causal direction I proposed. In particular, focusing on the future self may invite comparisons with the present self, therefore highlighting potential self-change. However, contrary to this argument, focusing on traits and characteristics of an imagined future self could equally be expected to highlight similarities between present and future self-concepts (McCarroll & Cosentino, 2020).

Alternatively, it is possible that the trait-stability manipulation was not convincing to participants, with the impact on self-reported psychological connectedness potentially attributable to demand characteristics (though the manipulation has been successfully used in previous studies, e.g., Bartels & Urminsky, 2011; Schanbacher et al., 2024).

Another possibility is that the experimental manipulation inadvertently primed participants in both groups to focus on their future self in the subsequent future thinking task, perhaps attenuating between-group differences in self-identity focus. While plausible, this explanation suggests that the impact of individual differences in psychological connectedness on self-identity focus should also have been weakened, but these correlations were significant.

2.4.3. Limitations and Future Research

An important limitation of the present research is that the significant psychological connectedness relationships with visual perspective and self-identity focus were correlational. It is worth noting that it seems unlikely that these correlations can be explained by common-method variance (e.g., Podsakoff et al., 2003). This is because psychological connectedness was measured using two approaches (overlapping circles; 0-100 sliding scale), both employing a different scale format to the dependent variables, and correlations were negative, meaning associations did not reflect a general response bias towards providing high scores. Study 2 was also able to rule out joint correlations with a related construct - self-concept clarity – as an alternative explanation for the association between lower psychological connectedness and increased focus on what future events expressed about self-identity. Nonetheless, an important direction for future research is to establish experimental evidence. This could be tested with an alternative to the trait-stability manipulation of psychological connectedness used in the present research. For example, participants could be directly asked to imagine either a dissimilar or similar possible future version of the self engaging in particular events and activities. This would have the advantage of explicitly linking the imagination of future activities to a particular future self-representation, rather than relying on effects of the experimental manipulation carrying over between tasks.

An additional limitation of the present research is that all participants were young adults living in the UK. Given age-group differences in strength of psychological connectedness, and perhaps even the mechanisms underpinning these judgements (Rutt & Löckenhoff, 2016), the findings are not necessarily generalisable to middle-aged and older adults. Additionally, previous research has revealed a number of potentially relevant cross-cultural differences in psychological connectedness and characteristics of mental representations. For example, compared to Western participants, East Asian participants have reported greater connectedness to their future self (Ji et al., 2019), more concrete (vs. abstract) mental representations (Kim et al., 2018), and a decreased tendency to explain behaviour in terms of underlying traits and dispositions (Lee et al., 1996).

Finally, it may be interesting for future research to examine the relationship between psychological connectedness and the mental representation of events occurring at different temporal distances into the future. While I have assumed that psychological connectedness would specifically influence how individuals think about events relating to a future self, the findings do not rule out the possibility that low psychological connectedness would be associated with a general tendency to focus on self-identity – even for events occurring prior to anticipated self-change. For example, might a student who feels dissimilar to their future self after graduation next year also focus more on what future events *before* graduation express about their identity?

2.4.4. Practical Implications

It is possible that a more prominent focus on self-identity during future thinking would influence the relative weight that individuals attach to different attributes of future decision outcomes. For example, consider an undergraduate student deciding between possible graduate jobs. One job offers practical benefits, like flexible working hours and a short commute, but is at a company known for unethical and exploitative manufacturing processes. The other job involves difficult hours and a long commute, but the role offers the opportunity to have a positive impact on society. The present research suggests that a student may give greater consideration to what their future job would say about them as a person when present and future selves are perceived as dissimilar, perhaps therefore shifting their preference towards the role with more desirable identity implications. Similarly, it may be advantageous for advertising and other persuasive communications to emphasise identity-based rather than practical benefits when targeting individuals making decisions for a future self whom they are likely to feel low connectedness to (e.g., due to an important intervening event or life transition).

2.5. Conclusions

While further research is required to establish causality, the current research provides novel evidence that the future self may be a more prominent focus in mental representations of future events when expected to be dissimilar from the present self. These findings have implications for judgement and decision making, with individuals potentially attaching higher importance to future decision attributes which express something desirable about self-identity when anticipating intervening personal change.

Chapter 3 – Identity-Relevant Attributes of Future Decision Outcomes

3.1. Introduction

While certain decision attributes relate to practical or experiential benefits, like the fuel efficiency of a car, or the comfort of its seats (Dhar & Wertenbroch, 2000), other attributes are subjectively valued – at least in part - because they express, verify, or contribute to a desirable self-image (Katz, 1960). For example, purchasing pro-environmental or ethically sourced products may communicate admirable moral and prosocial values, working for a prestigious organisation may bolster an individual's sense of importance or status (Lievens & Highhouse, 2003), and subscribing to a science magazine may make one feel like an intellectual (Savary & Dhar, 2020). Building on findings in Chapter 2 that lower psychological connectedness predicted an increased focus on self-identity during future thinking, I hypothesised that people would assign higher importance to future decision attributes which expressed something desirable about self-identity when anticipating intervening self-change. Although, to my knowledge, this relationship has not been directly examined before, several further lines of research are consistent with the hypothesis.

Firstly, Bartels et al. (2013) found that participants induced to experience low (vs. high) psychological connectedness to a future self indicated they would be willing to donate more of a future study bonus to charity. Bartels et al. proposed that this is because people have less reason to prioritise the interests of a dissimilar (vs. similar) future self, resulting in more equitable allocations with others. However, the findings are also consistent with a broader impact of low psychological connectedness on motivation to act in ways which project a positive future self-image. Expressing generosity towards others through charitable donations may be one manifestation of this, but other identity aspects are also likely to be viewed as desirable, such as high social status and intelligence.

Secondly, Dixon and Mikolon (2021) found that low self-concept clarity (SCC), reflecting perceived uncertainty or inconsistency in the self-concept (Campbell et al., 1996), was associated with higher willingness to pay for pro-environmental (vs. standard) household products. The authors suggest that when individuals perceive their current self-concept as uncertain, they derive greater subjective value from actions that contribute to a positive self-image. This finding can be seen as consistent with the hypothesis that lower psychological connectedness would be associated with higher perceived importance of identity-based attributes. In particular, a dissimilar future self may be less certain and confidently defined than a highly similar future self, since the former likely contains more traits and characteristics that have yet to be verified by social experience (Markus & Nurius, 1986).

Thirdly, Kivetz and Tyler (2007) found that participants rated identity-based (vs. concrete) benefits as more important when considering temporally distant (vs. proximal) future outcomes. For example, when choosing between academic courses that would start in a few days, students rated practical considerations - such as whether the professor usually gave good grades - as particularly important to their decision. In contrast, when deciding between courses that would start next academic year, identity-relevant attributes - like being treated with dignity and respect - were considered more important. Kivetz and Tyler (2007) proposed that increased psychological distance to a future self makes one’s high-level values and principles more salient, resulting in increased preference for future decision attributes which align with these ideals. Since a dissimilar future self could potentially be viewed as more psychologically distant from the present self (Maglio, 2020), Kivetz and Tyler's (2007) theoretical framework is also consistent with the present hypothesis regarding psychological connectedness and identity-based attributes of future decision outcomes.

It is important to distinguish the present hypothesis from previous research by Hershfield et al. (2012, Study 1), who found that people reporting higher similarity to their future self in ten years responded more ethically to hypothetical business dilemmas pitting their own financial self-interests against a morally correct course of action (e.g., voting for a mining operation that would harm the environment and local communities but provide the decision-maker with a large bonus). Hershfield et al. interpreted this relationship within an intertemporal choice framework, suggesting that financial rewards may be considered relatively proximal, while the potential fallout from one's unethical actions are expected to be more temporally distant. Individuals who feel lower psychological connectedness to their future self may therefore see the financial reward as relevant to their present self, and the eventual moral reckoning for their actions as a concern for a dissimilar future self. In contrast, rather than the relative prioritisation of immediate and future rewards, the present research concerns whether people prioritise different attributes (i.e., concrete vs. identity-based benefits) of a future outcome depending on their perceived similarity to the future self that will experience that outcome.

3.1.1. Overview of Studies

Four studies in the present research tested associations between psychological connectedness and perceived importance of future travel and job attributes. I used job and travel choices as both of these domains can involve significant temporal separation between the point of making the decision and experiencing the outcome (e.g., an undergraduate deciding on a post-graduation job, or booking a holiday for one's 40th birthday in a year's time), therefore increasing the potential practical relevance of the findings. Additionally, previous research suggests that both practical and identity-relevant attributes are potentially important considerations for these choices (Lievens & Highhouse, 2003; Beall et al., 2021).

Study 1 examined correlations in the context of an intervening life transition, with undergraduate students reporting perceived similarity to their graduate future self and rating the importance of identity-relevant and concrete attributes of future job and travel choices. Study 2 aimed to establish causal evidence by manipulating psychological connectedness among first-year undergraduate students using a trait-stability task (e.g., Bartels & Urminsky, 2011). Unfortunately, due to a smaller-than-expected sample size, the study was underpowered to detect the hypothesised effects. Nonetheless, I report results here for transparency and to contribute to the collective evidence across studies. Study 3A and 3B were pre-registered replications and extensions of Study 1, intended to further establish the robustness of associations. Study 3A used a non-student sample and a calendar-based temporal interval, with participants considering their future self in a year's time. Study 3B closely corresponded to Study 1's method but also included additional decision types to examine generalisability beyond job and travel choices. I first report findings for each study, and then results of internal meta-analyses (e.g., Goh et al., 2016) to determine the robustness of collective evidence across these studies.

3.1.2.1. Ethics

Ethics approval for the present research was obtained from the University of Nottingham School of Psychology Ethics Committee (Studies 1, 3A, & 3B - ref. S1542; Study 2 – ref. S1548). Participants provided online consent in each study.

3.1.2.2. Pre-Registration and Transparency

Hypotheses and planned analyses for both studies were preregistered with the Open Science Framework (OSF). Links to pre-registration forms, datasets, and analysis code are shown in Appendix A.

3.2. Study 1

In Study 1, I tested the hypotheses that lower psychological connectedness to a post-graduation future self among current undergraduate students would be associated with higher perceived importance of identity-relevant attributes of future job and travel decisions

3.2.1. Method

3.2.1.1. Participants and Statistical Power

Participants were UK-based undergraduate students, due to begin their second or third year of university at the start of the upcoming academic year (data were collected between late August and early September 2023). Target sample size was determined based on statistical power analysis conducted in G*Power (Faul et al., 2007). The analysis indicated that 269 participants were needed to achieve 80% power to detect an effect of $r = .17$ in a two-tailed Pearson's correlation test ($\alpha = .05$). To account for potential exclusions, the target sample size was increased to 320. The assumed effect size was considered plausible based on similarly sized correlations between psychological connectedness and self-identity focus observed in Chapter 2.

The target sample size was not quite achieved, with 291 participants recruited before the start of the new academic year, at which point data collection had considerably slowed. After 45 participants were excluded for failing an attention check question (see Procedure), 246 participants remained, with a mean age of 20.3 (SD = 1.2). 105 participants reported their gender as male, 133 as female, seven as non-binary or other, and one preferred not to specify. 94 participants expected to graduate in 2024, 97 in 2025, 45 in 2026, and 10 in 2027. Most (n = 233) participants reported being in full-time study.

3.2.1.2. Materials & Measures

Psychological Connectedness. Psychological connectedness was measured with future self-connectedness and future self-similarity items (e.g., Bartels & Urminsky, 2011). For both items, participants were first asked to think about the important traits and characteristics that make them the person they are now. For the future self-connectedness item, participants then indicated how connected they felt to their graduate future self by selecting between six pairs of increasingly overlapping circles (labelled 'Person now' and 'Person after university'), where no overlap meant 'completely disconnected' and total overlap meant 'completed connected'. For the second item, participants indicated how similar they felt to their graduate future self on a numerical scale from 0-100, where 0 meant 'completely different' and 100 meant 'exactly the same'. As the two items utilised different response scales, the average of their z-scores was used to create a composite psychological connectedness measure (e.g., Bartels & Urminsky, 2011). Although internal consistency of the scale was not particularly strong (α = .67), both items had a similar pattern of relationships with attribute importance ratings in Study 1, and the composite measure was therefore retained.

Attribute Importance Ratings. Participants were presented with 12 attributes of future jobs and 10 attributes of future travel choices (see Appendix D), and asked to rate the importance of each attribute on a seven-point scale (1 = not at all important;

7 = very important). Half of the attributes were intended to express something positive about self-identity (*identity-relevant attributes*), including prosociality, social status, and open-mindedness. Examples of identity-relevant attributes for job choice were, “Working for a prestigious company/organisation” and “Having a positive impact on society”. Examples of identity-relevant attributes for travel choice were “Giving back to local communities” and “Learning about different customs and cultures”. The other half of the attributes provided practical or hedonic (*concrete attributes*) benefits (e.g., “Having flexible working hours” [job]; “Staying in comfortable and modern accommodation” [travel]). Attributes were presented in alternating order of identity-relevant and concrete attributes.

Mean importance ratings across attributes were used to compute scale measures of job identity-relevant ($\alpha = .70$) and concrete attributes ($\alpha = .71$), and travel identity-relevant ($\alpha = .68$) and concrete attributes ($\alpha = .72$). Additionally, *relative identity-attribute importance* measures were computed by subtracting participants’ concrete attribute ratings from their identity-relevant attribute ratings (separately for job and travel choices). Higher scores on these measure indicated greater perceived importance of identity-relevant attributes *relative* to concrete attributes.

Attribute Identity-Expressiveness Ratings. To validate my categorisation of attributes, participants were asked to indicate the extent to which they believed each attribute would express something positive about them as a person on a seven-point scale (1 = not at all; 7 = very much) (Savary & Dahr, 2020). Perceived identity-expressiveness scales for concrete and identity-relevant attributes of jobs and travel choices were computed based on mean ratings across attributes (α’s > .74).

Self-Concept Clarity. SCC was measured using Campbell et al.’s (1996) 12-item scale ($\alpha = .90$). An example item was, “My beliefs about myself seem to change very frequently”. Responses were provided on a five-point scale (1 = strongly disagree; 5 = strongly agree). Items were reverse-scored where required so that higher scores reflected greater SCC. SCC was measured as it was considered a potentially important covariate, based on previous evidence of an association between SCC and willingness to pay for pro-environmental products (Dixon & Mikolon, 2021).

Other Identity-Related Measures. For exploratory purposes, several other identity-related measures were administered, all employing a seven-point response scale (1 = strongly disagree; 7 = strongly agree). Holmes et al.’s (2019) three-item *student identity-centrality* scale was administered to measure the extent to which participants viewed being a student as central to their self-concept. An example item was, “In general, being a student is an important part of my self-image”. The scale had good internal consistency (α = .89). A two-item *perceived transition importance* scale (α = .74) was created, which aimed to measure the extent to which participants’ perceived graduation as a significant transition in their lives (e.g., “Leaving university will mark an important transition in my life”). Iyer et al.’s (2009) four-item *multiple group membership* scale was administered, which captures the extent to which students identify with multiple social groups (e.g., “I am currently a member of several different groups (α = .89). Correlations between these identity-related measures, psychological connectedness, and attribute importance ratings are reported in the Appendix E (Table 15).

Control Measures. The following measures were included as possible control measures: expected year of graduation, perceived temporal distance to graduation (1 = feels very near; 7 = feels very far away), certainty of future job plans (1 = not at all certain; 7 = completely certain), whether participants had already been offered a job for when they graduate, whether participants planned to travel after graduating, and whether participants were on a full-time or part-time course.

3.2.1.3. Procedure

Participants were recruited via Prolific (https://www.prolific.co/) and paid £1.20 to complete a short online study titled 'General attitudes and judgements'; the title was kept intentionally vague so as not to draw attention to the purpose of the study. After providing informed consent, participants completed student identity-centrality, perceived transition importance, and psychological connectedness measures, followed by the attribute rating task for future jobs and then for future travel. After the attribute rating task, participants responded to an attention check question asking them to specify which two choices they had been asked to consider in the previous task, with houses, apartments, travel abroad, university courses, jobs, pets, and clothing listed as possible responses. Participants failing to indicate both correct responses (i.e., jobs; travel abroad) were subsequently excluded from all analyses. After the attention check, participants completed the SCC and multiple group membership scales, followed by the control measures (e.g., perceived temporal distance to graduation).

3.2.2. Results & Discussion

3.2.2.1. Validating Categorisation of Identity-Relevant Attributes

To verify that my classification of attributes matched participants' perceptions, paired samples t-tests were conducted to compare participant identity-expressiveness ratings for attributes categorised as identity-relevant and concrete. For future jobs, identity-relevant attributes (M = 5.23, SD = 1.04) received higher participant identity-expressiveness ratings than concrete attributes (M = 3.22, SD = 1.38), $t(245) = 20.71$, $p < .001$, $d = 1.32$. Similarly, for future travel, identity-relevant attributes (M

= 5.27, *SD* = 1.00) received higher participant identity-expressiveness ratings than concrete attributes (*M* = 3.33, *SD* = 1.41), $t(245) = 20.60$, $p < .001$, $d = 1.31$. Additionally, for both job and travel choices, every attribute classified as identity-relevant received a significantly higher participant identity-expressiveness rating than every attribute classified as concrete (Appendix E, Tables 16-17). Participants' identity-expressiveness ratings therefore aligned well with my categorisations.

3.2.2.2. Descriptive Statistics

Mean scores for psychological connectedness measures and attribute importance ratings are displayed in Table 3.1. Since the four studies in this chapter included similar measures, their descriptive statistics are reported together in Table 3.1 for conciseness.

In Study 1, both psychological connectedness items (connectedness and similarity) were close to the scale midpoints. Identity-attribute importance ratings were above scale midpoints for both job and travel choices, but not close to maximum values. Relative importance of identity-relevant attributes was negative for travel and positive for jobs, suggesting that identity-relevant attributes were rated more important than concrete attributes for future jobs, while the reverse was true for future travel.

Table 3.1

Means and standard deviations for measures across studies

Measure	Study 1		Study 2		Study 3A		Study 3B	
	M	***SD***	***M***	***SD***	***M***	***SD***	***M***	***SD***
Connected	3.60	0.95	3.90	0.94	3.97	1.11	3.61	1.04
Similarity	54.92	19.52	60.44	17.26	59.56	21.48	55.18	20.94
PC scale	0.00	0.87	0.00	0.88	0.00	0.91	0.00	0.86
Attribute importance measures								
Travel identity	4.88	0.95	5.00	0.93	4.76	0.89	4.99	0.92
Travel concrete	5.10	0.95	5.16	0.89	5.41	0.93	5.19	0.97
Travel RIAI	-0.23	1.16	-0.16	1.20	-0.65	1.25	-0.21	1.20
Job identity	4.83	0.95	4.25	1.07	-	-	4.82	1.05
Job concrete	4.50	0.92	4.23	0.90	-	-	4.62	0.97
Job RIAI	0.33	1.18	0.02	1.27	-	-	0.19	1.18

Note. Connected = future self-connectedness; Similarity = future self-similarity; PC = psychological connectedness (mean of similarity and connectedness z-scores). RIAI = relative identity-attribute importance.

Future self-connectedness measured on a six-point scale of increasingly overlapping circles.

Future self-similarity measured on a 0-100 numerical scale.

3.2.2.3. Correlations with Identity-Attribute Importance Ratings

Correlations between measures are displayed in Table 3.2. Consistent with hypotheses, lower psychological connectedness correlated with higher identity-attribute importance ratings for jobs, $r(244) = -.21$, $p < .001$, 95% CI [-.33, -.09], and travel choices, $r(244) = -.35$, $p < .001$ 95% CI [-.46, -.24]. Psychological connectedness correlations with perceived importance ratings were consistent across the five attributes within the identity-relevant travel scale and the six attributes within the identity-relevant job scale (Appendix E, Table 18). Also consistent with hypotheses, for travel choice, lower psychological connectedness was associated with higher relative identity-attribute importance scores, $r(244) = -.18$, $p = .004$, 95% CI [-.30, -.06]. For job attributes, visual inspection of the scatterplot between psychological connectedness and relative identity-attribute importance revealed an extreme bivariate outlier. This correlation was therefore analysed using Spearman's rank, which was not significant, $r_s(244) = -.08$, $p = .23$, 95% CI [-.20, .05]. The significance of the above correlations did not change after controlling for perceived or actual temporal distance to graduation (Appendix E, Table 19).

Table 3.2

Study 1 correlations between psychological connectedness, SCC, and attribute importance ratings

Variables	1	2	3	4	5
1. PC scale					
2. SCC	.04				
3. Job identity	-.21***	-.03			
4. Travel identity	-.35***	-.08	.49***		
5. Job concrete	-.01	-.09	.19**	.13*	
6. Travel concrete	-.13*	.13*	.34***	.26***	.44***

Note. PC = psychological connectedness (mean of similarity and connectedness z-scores); SCC = self-concept clarity.

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

3.2.2.4. Self-Concept Clarity Correlations

As with psychological connectedness, for travel choice, lower SCC was associated with higher relative identity-attribute importance, $r(244) = -.17$, $p = .007$, 95% CI [-.29, -.05]. However, psychological connectedness was not correlated with SCC (Table 3.2), and the partial correlation between psychological connectedness and relative identity-attribute importance – controlling for SCC – remained significant, $r_p(243) = -.18$, $p = .005$.

3.3. Study 2

Study 1 results were largely consistent with my hypothesis that lower psychological connectedness would be associated with higher perceived importance of identity-relevant attributes of future decision outcomes. In Study 2, I sought to establish causal evidence by manipulating how similar/connected first-year undergraduate students felt to their future self a year from now, using a trait-stability task based on previous research (Bartels & Urminsky, 2011; Sedikides et al., 2015; Schanbacher et al., 2024). I hypothesised that participants in the low (vs. high) psychological connectedness condition would report higher relative identity-attribute importance for future job and travel choices. Self-reported psychological connectedness was also measured to examine correlational evidence, as in Study 1. However, we were only able to recruit 60% of the target sample size, leaving the study substantially underpowered to detect hypothesised between-groups effects. Confirmatory hypotheses tests are reported here for transparency, alongside correlational analysis to contribute to collective evidence across studies.

3.3.1. Method

3.3.1.1. Participants and Statistical Power

Target participants were UK-based first-year undergraduates in their first term of university. I had intended to recruit a sample of 320 participants, based on target statistical power of 80% to detect an effect size of $d = 0.31$ in an independent samples t-test (one-tailed), with $\alpha = .05$ (Faul et al., 2007). This indicated a required a sample size of 260 participants, which was increased to 320 to account for possible exclusions.

However, by the *a priori* planned stopping date, only 189 participants had been recruited. After 34 participants were excluded for incorrectly answering an attention check question (same question as in Study 1), the final sample size was 155, with a mean age of 19.4 ($SD = 1.8$). 42 participants reported their gender as male, 108 as female, four as non-binary or other, and one preferred not to specify.

3.3.1.2. Materials and Procedure

Participants were recruited through Prolific and the University of Nottingham research participation scheme (RPS). Prolific participants were paid £1.35 to participate and RPS participants received partial course credit. After providing informed consent, participants were randomly assigned to one of two experimental conditions designed to lead them to anticipate change or stability in their identity-relevant characteristics throughout their first year of university. Participants in both conditions first read that during the first year of university, students "often have new experiences, meet a diverse range of people, form new relationships, and are exposed to different ideas and perspectives". Depending on condition, participants then read either that students typically report feeling like a different person by the end of their first year (low connectedness), or that their core identity remains stable despite their new circumstances (high connectedness) (Bartels & Urminsky, 2011; Sedikides et al., 2015). Participants then completed a short writing task in which they were asked to describe some of their own important traits and characteristics they thought might change (low connectedness) or remain stable (high connectedness) during their first year of university (e.g., Schanbacher et al., 2024). See Appendix D for verbatim wording of manipulation.

After the manipulation, participants were asked to think about what would be important to them if they were planning to get a part-time job or to go travelling in the summer after their first year of university. Attributes were similar to Study 1, with small changes designed to increase relevance to undergraduate students considering part-time work and travel between academic years (job identity-relevant attributes, $\alpha = .76$; job concrete attributes, $\alpha = .63$; travel identity-relevant attributes,

$\alpha = .69$; travel concrete attributes, $\alpha = .70$). Participants then completed the same attention check question as Study 1.

A psychological connectedness scale ($\alpha = .70$) was then administered based on the same items as Study 1, with references to 'after university' replaced with 'a year from now'. SCC was also measured in the same way as Study 1 ($\alpha = .85$). I additionally measured the extent to which the future self a year from now was expected to be positively valenced (1 = not at all positive, 7 = very positive), and idealistic versus pragmatic (1 = extremely pragmatic; 7 = extremely idealistic) (Kivetz & Tyler, 2007). See Appendix E (Table 20) for correlational results controlling for these measures.

3.3.2. Results & Discussion

3.3.2.1. Effects of Psychological Connectedness Manipulation

The effects of the experimental manipulation on perceptions of psychological connectedness and identity-attribute importance ratings were examined using independent samples t-tests. Cell means and standard deviations are displayed in Table 3.3. The manipulation appeared to successfully influence perceptions of psychological connectedness, with significantly higher scores in the high (vs. low) psychological connectedness experimental condition (Table 3.3). However, contrary to the confirmatory hypotheses, relative identity-attribute importance for future jobs and travel did not differ between high and low psychological connectedness conditions (Table 3.3).

Table 3.3

Means and standard deviations by high and low psychological connectedness condition

	High		Low				
Variables	***M***	***SD***	***M***	***SD***	***t*(153)**	***p***	***d* [95% CI]**
PC scale	0.22	0.88	-0.21	0.83	3.11	.002	0.50 [0.18, 0.82]
Job identity	4.29	0.85	4.21	1.25	0.51	.61	0.08 [-0.23, 0.40]
Travel identity	4.89	0.90	5.11	0.96	-1.44	.15	-0.23 [-0.55, 0.09]
Job RIAI	0.13	1.19	-0.09	1.34	1.05	.29	0.17 [-0.15, 0.48]
Travel RIAI	-0.12	1.18	-0.19	1.23	0.37	.71	0.06 [-0.26, 0.37]

***Note*.** PC = psychological connectedness (mean of similarity and connectedness z-scores); RIAI = relative identity-attribute importance.

3.3.2.2. Exploratory Correlation Analyses

Consistent with Study 1, for travel choice, lower psychological connectedness was associated with higher identity-attribute importance, $r(153) = -.16$, $p = .050$, 95% CI [-.31, -.0004]. The correlation with part-time job identity-attribute importance was in the expected direction but not significant, $r(153) = -.11$, $p = .16$, 95% CI [-.27, .05]. Contrary to Study 1, psychological connectedness was not associated with relative identity-attribute importance for future travel, $r(153) = -.03$, $p = .72$, 95% CI [-.19, .13], or part-time job choice, $r(153) = -.01$, $p = .90$, 95% CI [-.17, .15].

3.4. Study 3A and 3B: Pre-Registered Replications

Correlational results across Studies 1 and 2 were broadly consistent with expectations, but to further establish the robustness of relationships, two additional pre-registered replication studies were conducted. Study 3A used a non-student sample, where participants thought about future travel abroad a year from now. Study 3B aimed to more directly replicate Study 1, with undergraduate participants asked to think about their future self after graduation.

Since relationships across Studies 1 and 2 appeared to be stronger for travel attributes, confirmatory hypotheses tests in Study 3 focused on identity-attribute importance and relative identity-attribute importance for travel choice. However, job attributes were also included for exploratory analysis in Study 3B, alongside travel and two additional choice types (mobile phone purchase; use of leisure time).

Hypotheses for Studies 3A and 3B were that lower psychological connectedness would be associated with higher (1) identity-attribute importance and (2) relative identity-attribute importance (vs. concrete-attribute ratings) for future travel choice.

3.4.1. Study 3A

3.4.1.1. Method

Participants and Statistical Power. Participants were young adults in the UK (aged 18-25), who had not participated in either of the two previous studies. The planned sample size of 410 participants was based on an *a priori* power analysis conducted in G*Power (Faul et al., 2007), with the aim of achieving 80% power to detect an effect of $r = .15$ in a two-tailed correlation analysis ($\alpha = .05$) – which was slightly smaller than the observed correlation between psychological connectedness and relative identity-attribute importance for travel choice in Study 1. Power analysis indicated a required a sample size of 346 participants, which was increased to 410 to allow for exclusions.

410 participants were recruited as planned, with 400 remaining after 10 exclusions for failing an attention check question (see Materials and Procedure). The final sample had a mean age of 23.1 (SD = 1.8), with 193 participants reporting their gender as male, 193 as female, 13 as non-binary or other, and one preferred not to specify.

Materials and Procedure. Participants were recruited through Prolific and paid £1.05 to complete a short online study. After providing informed consent, participants reported psychological connectedness to their future self a year from now (α = .78), using the same similarity and connectedness items as Study 2, and then completed the travel attribute rating task from Study 1 (identity attributes, α = .61; concrete attributes, α = .73). Job attributes were not measured in this study.

After the attribute rating task, participants completed attention check questions asking them to specify the activity they had been rating in the previous section (job interview, travel abroad, moving house, buying clothes, exercising), and how far into the future they had been asked to imagine it happening (1 week, 1 month, 6 months, 1 year, 2 years, 5 years). As in the previous studies in this chapter, participants also completed the SCC scale (α = .88).

Additionally, as an exploratory measure, participants completed the dimensions of identity development scale (DIDS; Luyckx et al., 2008). DIDS contains 20 items assessing five sub-dimensions of identity development: (1) commitment making (e.g., "I have decided on the direction I want to follow in life"); (2) identification with commitment (e.g., "Because of the path of life I have mapped out, I feel certain about myself”; (3) exploration in breadth (“I think a lot about what to do with my life”); (4) exploration in depth (“I talk regularly with other people about the plans for the future I have made”); (5) ruminative exploration (“I keep looking for the direction I want to take in my life”). Responses to all DIDS items were provided on a five-point scale (1 = strongly disagree; 5 = strongly agree). It was expected that lower psychological connectedness would be associated with higher scores for identity exploration sub-scales.

3.4.1.2. Results

Confirmatory Hypotheses Tests. Means and standard deviations for psychological connectedness and attribute importance measures are reported in Table 3.1. Contrary to the pre-registered hypotheses, two-tailed significance tests did not reveal significant correlations between psychological connectedness and identity-attribute importance ratings, $r(398) = -.05$, $p = .36$, 95% CI [-.14, .05], or relative identity-attribute importance, $r(398) = -.07$, $p = .18$, 95% CI [-.16, .03].

Exploratory Analysis: Psychological Connectedness and Identity Status. Table 3.4 shows the correlations between psychological connectedness and sub-scales of DIDS (Luyckx et al., 2008). The psychological connectedness scale did not significantly correlate with any of the DIDS sub-scales. However, future self-similarity – but not connectedness – was significantly negatively correlated with exploration in depth and breadth. Interestingly, despite future self-similarity and connectedness being strongly positively with each other, $r(398) = .64$, $p < .001$, their associations with exploration in depth were not even in the same direction (Table 3.4). I return to the potential distinction between future self-connectedness and similarity throughout the rest of this chapter.

Table 3.4

Zero-order correlations between psychological connectedness measures and dimensions of identity development sub-scales

Measures	CM	IWC	EB	ED	RE
PC Scale	.04	.03	-.06	-.05	-.05
Connected	.09	.08	-.01	.02	-.03
Similarity	-.01	-.03	-.10*	-.11*	-.05
Mean	3.15	3.15	3.77	3.23	3.35
SD	0.99	1.02	0.83	0.88	0.86

Note. CM = commitment; IWC = identification with commitment; EB = exploration in breadth; ED = exploration in depth; RE = ruminative exploration; PC = psychological connectedness; connected = future self-connectedness; similarity= future self-similarity.

df = 398

* $p < .05$

3.4.1.3. Discussion

The absence of a correlation between psychological connectedness and travel identity-attribute importance was surprising given consistent evidence for an association between these measures in Studies 1 and 2. It is potentially relevant that in the first two studies, participants thought about future travel after a personally meaningful event or transition: graduating from university in Study 1, and finishing first year in Study 2. It is possible that the relationship between psychological connectedness and identity-attribute importance was somehow weaker in Study 3A due to the use of an arbitrary calendar-based interval of ‘a year from now’. For example, perhaps individuals are more strongly motivated to establish a desirable future self-identity when it relates to an autobiographically meaningful lifetime period. In Study 3B, I therefore aimed to directly replicate Study 1 using a new sample drawn from the same population (i.e., current undergraduate students) to establish the robustness of these initial findings.

3.4.2. Study 3B

Confirmatory hypotheses in Study 3B were the same as Study 3A, though I pre-registered an intention to use one-tailed significance tests. This was to maximise statistical power, and based on the consistent direction of effects observed in the previous three studies. For the purposes of exploratory analyses, I also extended the range of decision types that participants were asked to consider, and tested the association between psychological connectedness and this overall identity-attribute importance scale (travel, job, mobile phone, use of leisure time).

Furthermore, my theoretical rationale suggests that the relationship between psychological connectedness and the subjective value individuals ascribe to attributes with desirable identity implications should be dependent upon the temporal location of the outcome. In particular, lower psychological connectedness should be selectively associated with higher perceived importance of positive identity-expressive outcomes that would be experienced *after* undergoing self-change. To test this idea directly, after completing measures relating to the confirmatory hypothesis tests, participants were randomly assigned to report pro-environmental intentions relating either to the present or the future after graduating.

3.4.2.1. Methods

Participants and Statistical Power. Participants were undergraduate students in the UK, who were in at least their second year of study, and had not participated in any of the previous three studies. I aimed to recruit 400 participants, based on 80% power to detect an effect size of $r = .15$ in a Pearson's correlation test (one-tailed), where α

= .05. This analysis in G*Power (Faul et al., 2007) indicated a required sample size of 273, which was increased to 400 participants to account for exclusions and maximise statistical power.

400 participants were recruited, with 319 remaining after 81 were excluded for failing an attention check question (same question as Study 1). The final sample had a mean age of 21.3 (*SD* = 1.5), with 116 participants reporting their gender as male, 195 as female, and 8 as non-binary or other.

Materials & Procedure. Participants were recruited through Prolific and paid £1.35 to complete a short online study. After providing informed consent, participants completed the same student identity-centrality (α = .85), perceived transition importance (α = .73), and psychological connectedness measures as Study 1. However, the composite psychological connectedness scale did not have particularly strong internal consistency in Study 3B (α = .64), and separate analyses were therefore additionally performed for the individual future self-connectedness and similarity items. Participants subsequently completed the job (identity, α = .76; concrete, α = .75) and travel (identity, α = .64; concrete, α = .73) attribute rating task and attention check question used in Study 1. Participants then completed the SCC scale (α = .91), followed by a four-item self-continuity scale (α = .84) adapted from Hong et al. (2024), which was administered for exploratory purposes. An example item from the self-continuity scale was "There is continuity in my life – from present to the future after leaving university", with responses provided on a seven-point scale (1 = not at all; 7 = very much).

Participants were then presented with brief attribute rating tasks for two additional future choices (mobile phone purchase and use of leisure time), which aimed to examine the generalisability of findings beyond travel and job choices. Leisure time and mobile phone attribute measures each included two identity-relevant attributes (e.g., “Taking on challenges” [leisure time]; “Made from sustainable materials” [mobile phone]) and two concrete/experiential benefits (e.g., “Relaxing and unwinding” [leisure time]; “Large storage capacity” [mobile phone]). I averaged identity-relevant attribute ratings across decision types to create a 15-item overall identity-relevant attribute importance scale ($\alpha = .83$). An additional attention check was included after leisure time and mobile phone attribute measures, with participants asked which two things they had been asked to consider in the prior task, with mobile phones, apartments, leisure time, pets, clothing, and university courses listed as possible response options. In accordance with the pre-registered analysis plan, participants failing this second attention check question were excluded from any analyses involving leisure time and mobile phone attribute ratings.

As a further exploratory task, participants were randomly assigned to rate their intention to perform eight pro-environmental actions either in the present (“Thinking about yourself in the here-and-now, please rate how likely or unlikely you would be to perform each of the following actions”) or in the future after leaving university (“Thinking about yourself in the future after leaving university, please rate how likely or unlikely you would be to perform each of the following actions”). The purpose of this task was to examine if relationships between psychological connectedness and ethical behavioural intentions were moderated by temporal location. All behavioural intention items (e.g., “Boycott companies with poor environmental practices”) were rated on a seven-point scale (1 = very unlikely, 7 = very likely), and combined into a single scale (present sustainability: $\alpha = .91$; future sustainability: $\alpha = .89$).

Finally, participants reported perceived temporal distance to graduation, future work/travel plans, and whether they planned to continue in full-time education after graduating.

3.4.2.2. Results & Discussion

Confirmatory Hypotheses Tests. Means and standard deviations for psychological connectedness and travel attribute ratings are reported in Table 3.1. In accordance with the pre-registered analysis plan, one-tailed significance tests were used to examine confirmatory hypotheses that lower psychological connectedness would be associated with higher perceived identity-attribute importance and higher relative identity-attribute importance for future travel choice.

Contrary to expectations, the correlation between psychological connectedness and identity-attribute importance was not significant, $r(317) = -.08$, $p = .07$. However, since the psychological connectedness scale had fairly weak internal consistency, I also examined one-tailed correlations for future self-connectedness and similarity measures separately, using a Bonferroni adjustment for multiple comparisons ($\alpha = .025$). Results indicated that lower future self-similarity was significantly correlated with higher identity-attribute importance, $r(317) = -.12$, $p = .013$, while the correlation for future self-connectedness was not significant, $r(317) = -.02$, $p = .39$.

For the relative identity-attribute importance measure, correlations were not significant for either future self-similarity, $r(317) = -.05$, $p = .17$, or future self-connectedness, $r(317) = .05$, $p = .83$.

The significance of the correlations did not change after controlling for perceived or actual temporal distance to graduation (see Appendix E, Table 21).

Overall Identity-Attribute Importance Scale (Exploratory). I next examined relationships between psychological connectedness and the overall identity-attribute importance scale (jobs, travel, mobile phone, use of leisure time). Following the pre-registered analysis plan for exploratory analyses involving the mobile phone and leisure time attribute measures, I additionally excluded participants who failed the second attention check question (n = 15).

The mean score for the overall identity-attribute importance scale was 4.82 (SD = 0.81). Consistent with my exploratory hypothesis, two-tailed correlation tests revealed that lower psychological connectedness was associated with higher identity-attribute importance, $r(302) = -.13$, $p = .026$, 95% CI [-.24, -.02]. Furthermore, as with travel attributes, overall identity-attribute importance was negatively correlated with future self-similarity, $r(302) = -.15$, $p = .010$, 95% CI [-.26, -.03], but not future self-connectedness, $r(302) = -.07$, $p = .21$, 95% CI [-.18, .04].

I also examined associations between Hong et al.'s (2024) future self-continuity measure, future self-similarity and connectedness, and overall identity-attribute importance. Self-continuity was correlated with both future self-connectedness, $r(317) = .14$, $p = .008$, 95% CI [.04, .26], and future self-similarity, $r(317) = .18$, $p = .001$, 95% CI [.07, .29], though associations were fairly weak. Notably, self-continuity was *positively* correlated with overall identity-attribute importance ratings, $r(302) = .23$, $p < .001$, 95% CI [.12, .33], in contrast to the negative association observed for future self-similarity. Multiple linear regression analysis on overall identity-attribute importance, with future self-similarity and Hong et al.'s (2024) future self-continuity scale simultaneously entered as predictors confirmed that the two measures had significant independent effects in opposing directions (future self-similarity: $\beta = -.19$, $p < .001$; future self-continuity: $\beta = .26$, $p < .001$).

Pro-Environmental Intentions (Exploratory). Multiple linear regression analyses were conducted on pro-environmental intentions, with the between-groups temporal location condition (now; after graduation), future self-similarity/connectedness, and their two-way interaction simultaneously entered as predictors. Separate models were computed for future self-connectedness and similarity.

Results of the regressions are displayed in Table 3.5. For the future self-connectedness model there was a significant interaction between temporal location and future self-connectedness. Simple slopes analysis revealed that future self-connectedness was negatively associated with pro-environmental intentions in the future condition (b = -0.20, SE = 0.10, p = .049) but not the present condition (b = 0.11, SE = 0.10, p = .30). This is consistent with my theoretical rationale, with lower future self-connectedness associated with positive identity-expressive behavioural intentions in relation to future (and not present) actions. However, for future self-similarity, the interaction with temporal location was not significant (Table 3.5). Therefore, in contrast to associations with identity-attribute importance measures, for future vs. present pro-environmental intentions, the connectedness measure more closely corresponded with theoretical expectations than the similarity measure.

Table 3.5

Multiple regression analyses on pro-environmental behavioural intentions

Model/Variable	*b*	*SE*	*p*
Connected Model: $F(3, 315) = 1.71$, $p = .16$, $R^2_{adj} = .01$			
Connectedness (overlapping circles)	-0.04	0.07	.53
Temporal location (ref = present)	-0.06	0.15	.68
Connectedness x Temporal location	-0.31	0.14	.033
Similarity Model: $F(3, 315) = 1.09$, $p = .35$, $R^2_{adj} = .001$			
Similarity (0-100)	-0.01	0.004	.08
Temporal location (ref = present)	-0.06	0.15	.67
Similarity x Temporal location	0.002	0.01	.83

Note. Temporal location was a between-groups independent variable (sample sizes: n = 164 in the present condition and n= 155 in the future condition).

Connected = future self-connectedness; Similarity = future self-similarity.

Ref = reference category.

3.5. Internal Meta-Analyses

As the significance of hypothesised associations was not entirely consistent across studies, I conducted internal meta-analyses (Goh et al., 2016) on future travel and job attribute importance ratings to examine robustness of the collective evidence. Meta-analyses were performed using the *metafor* package in *R* (Viechtbauer, 2010), with random-effects models fitted using restricted maximum likelihood (REML) estimation (Langan et al., 2019).

3.5.1. Travel Attribute Importance Ratings

Table 3.6 shows future self-connectedness and future self-similarity correlations with identity and concrete-attribute importance ratings for future travel choices in each of the four studies. The correlation between future self-similarity and identity-attribute importance was in the expected direction in all studies, and statistically significant at $p < .05$ (two-tailed) in Studies 1, 2, and 3B. Conversely, the correlation between future self-connectedness and identity-attribute importance was only significant in Study 1. Results of internal meta-analyses for future self-similarity and connectedness correlations with travel attribute importance ratings are shown in Table 3.6. Consistent with expectations, lower future self-similarity was correlated with higher identity-attribute importance, and not concrete-attribute importance. Moreover, a meta-analysis of correlations between future self-similarity and *relative* identity-attribute importance revealed the hypothesised negative correlation – though only weakly, $r = -.08$, $p = .006$, 95% CI [-.14, -.02]. SCC also had a significant negative association with relative identity-attribute importance for travel choice, $r = -.10$, $p = .020$, 95% CI [-.18, -.02]. However, partial correlations between future self-similarity and relative identity-attribute importance – controlling for SCC - remained significant, $r = -.07$, $p = .018$, 95% CI [-.13, -.01]. In contrast to future self-similarity correlations, future self-connectedness was not significantly associated with travel identity-attribute importance, though there was significant heterogeneity in effect size across studies (Table 3.6).

Table 3.6

Internal meta-analysis of future self-connectedness and future self-similarity zero-order correlations with attribute importance ratings for future travel

Measure/Study	Identity attributes	Concrete attributes
Similarity (0-100)		
Study 1	-.27***	-.10
Study 2	-.21**	-.14
Study 3A	-.09	.02
Study 3B	-.12*	-.05
Random-effects model		
Effect size (r) [95% CI]	-.17*** [-.25, -.08]	-.05 [-.12, .01]
Heterogeneity: $Q(3)$	6.28, p = .10	3.79, p = .29
I^2	52.6%	22.8%
Connected (overlapping circles)		
Study 1	-.34***	-.12
Study 2	-.07	-.08
Study 3A	.01	.07
Study 3B	-.02	-.08
Random-effects model		
Effect size (r) [95% CI]	-.10 [-.27, .06]	-.05 [-.14, .04]
Heterogeneity: $Q(3)$	25.00, p <.001	6.87, p = .08
I^2	87.0%	55.4%

Note. Connected = future self-connectedness; Similarity = future self-similarity

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

3.5.2. Job Attribute Importance Ratings

Since job attributes were not measured in Study 3A, meta-analyses for these measures were based on Studies 1, 2, and 3B. Results of internal meta-analyses are shown in Table 3.7. Again, consistent with expectations, lower future self-similarity was correlated with higher identity-attribute importance, and not concrete-attribute importance (Table 3.7). However, in contrast to travel attributes, the correlation between future self-similarity and relative identity-attribute importance was not significant, $r = -.05$, $p = .40$, 95% CI [-.12, .02]. Future self-connectedness followed the same pattern of results as future self-similarity for job choice, with lower future self-connectedness associated with higher identity-attribute importance and not concrete-attribute importance (Table 3.7). The correlation between future self-connectedness and relative identity-attribute importance for future jobs was not significant, $r = -.08$, $p = .13$, 95% CI [-.17, .02].

Table 3.7

Internal meta-analysis of future self-connectedness and future self-similarity zero-order correlations with attribute importance ratings for future jobs

Measure/Study	Identity attributes	Concrete attributes
Similarity (0-100)		
Study 1	-.14*	-.004
Study 2	-.09	-.08
Study 3B	-.11	-.09
<u>*Random-effects model*</u>		
Effect size (*r*) [95% CI]	-.12** [-.19, -.04]	-.06 [-.13, .01]
Heterogeneity: *Q(2)*	0.33, p = .85	1.21, p = .55
I^2	0.0%	0.0%
Connected (overlapping circles)		
Study 1	-.23***	-.02
Study 2	-.11	-.13
Study 3B	-.09	-.05
<u>*Random-effects model*</u>		
Effect size (*r*) [95% CI]	-.15** [-.24, -.06]	-.06 [-.13, .02]
Heterogeneity: *Q(2)*	2.92, p = .23	1.23, p = .53
I^2	34.5%	0.0%

Note. Connected = future self-connectedness; Similarity = future self-similarity

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

3.6. General Discussion

People sometimes imagine their future self being quite different to their present self, with lower perceived similarity between selves associated with a reduction in future-oriented behaviour (e.g., Ersner-Hershfield et al., 2009a; Bartels & Urminsky, 2011). Extending previous work in this area, the present research provided novel evidence that people attach more importance to future decision attributes expressing something desirable about self-identity when they perceive their present and future selves as dissimilar. Importantly, correlations were not significant for concrete (i.e., practical/hedonic) benefits, suggesting against a low-effort response strategy whereby participants reporting lower future self-similarity simply rated all attributes as more important. These findings have potential implications for marketers and organisations seeking to shape or support individual decision-making during periods of anticipated self-change, such as life transitions.

3.6.1. Future Self-Similarity vs. Connectedness

While I had planned to analyse psychological connectedness using a composite of future self-similarity and connectedness items, internal consistency was relatively weak in two of the four studies, which led me to also examine correlations separately. Results indicated more robust associations for the future self-similarity measure, which significantly negatively correlated with job and travel identity-attribute importance across studies, as well as an overall identity-attribute importance scale encompassing job, travel, mobile phone, and leisure time choices (Study 3B). Other researchers have also recently found relatively low internal consistency for future self-connectedness and similarity items, as well as contrasting relationships with their outcome of interest, with higher connectedness and lower similarity associated with an increased intention to act upon self-improvement goals (Ganschow et al., 2024). Furthermore, exploratory correlations in the present research also indicated that future self-similarity – but not connectedness - correlated with exploration sub-scales of identity development status (Study 3A).

Taken together, emerging findings therefore suggest that future self-similarity and connectedness may tap into subtly different constructs. It might be suggested that rather than perceived similarity, connectedness taps into something akin to self-continuity; that is, a meaningful perceived connection between selves despite self-change (Vignoles et al., 2006). Data were not entirely consistent with this view, since Hong et al's (2024) self-continuity measure had similarly sized correlations with future self-similarity and connectedness items. However, somewhat analogous to Ganschow et al.'s (2024) findings, there was a striking contrast between future self-similarity and self-continuity, with the latter *positively* associated with identity-attribute importance ratings. Disentangling future self-similarity, connectedness, and continuity measures is an important topic for future research.

3.6.2. Alternative Explanations for Relationships

It may be argued that correlations observed in the present research could potentially be explained by joint relationships with another construct, or perhaps run in the reverse causal direction to what I have theorised. Partially counter to the former possibility, I was able to rule out several potentially confounding variables, including SCC, both actual and perceived temporal distance, and future self-positiveness. Regarding the issue of reverse causality, psychological connectedness measures were administered prior to the attribute rating task in three of the four studies, meaning the process of providing attribute ratings could not have influenced future self-similarity judgements. However, it could still be the case that a general propensity to prioritise outcomes which contribute to a desirable self-image leads people to experience more objective self-change over time, resulting in lower expectations of present identity remaining stable into the future.

I attempted to establish causal evidence in Study 2 using a version of a trait-stability manipulation (Bartels & Urminsky, 2011), in which participants wrote about anticipated change or stability in their personal characteristics throughout the first year of university. Though the manipulation did not significantly impact identity-attribute importance ratings, this may have been attributable to low statistical power due to a much smaller sample than anticipated. It is also possible that the manipulation inadvertently primed an increased focus on self-identity which carried over between tasks. This may have made identity implications of future outcomes salient even to participants in the high-connectedness condition, perhaps attenuating any between-groups differences caused by experimentally-induced differences in psychological connectedness itself.

3.6.3. Limitations

In addition to evidence being correlational, it is worth noting some other important limitations – particularly regarding the generalisability of findings. Firstly, participants were all young adults living in the UK. Perceived similarity/connectedness between present and future selves - and potentially even the mechanisms underpinning these judgements (Rutt & Löckenhoff, 2016) – vary by age, meaning the findings may not generalise to other age groups. Additionally, people from East Asian societies are more likely to conceptualise their identity in terms of interconnectedness with others, while those from Western societies view themselves more as distinct individuals, with a stable set of traits and dispositions across contexts (Markus & Kitayama, 1991). These differences in self-representations are likely to influence which attributes are viewed as expressing a desirable self-image (e.g., de Mooij & Hofstede, 2011), and perhaps the extent to which future decisions are viewed as expressive of self-identity at all, since East

Asians are less likely to make dispositional attributions than Westerners (Lee et al., 1996). Secondly, most of the studies only examined (hypothetical) future job and travel judgements. The extent to which findings generalise to other domains and real-life decisions is worthy of further investigation.

3.6.4. Implications & Future Research

The present findings have potential implications for how organisations, such as employers, travel agencies, and brands, can better communicate value to potential customers or job applicants. In particular, it may be beneficial to highlight identity-based benefits of future decision outcomes when individuals are likely to perceive lower similarity (though not discontinuity) between the present self making a decision and the future self that will experience the outcome. This may perhaps be the case when anticipating significant, but normative, life transitions, like graduating from university.

Furthermore, even less significant intervening events, like birthdays, have been found to decrease perceived similarity between present and future selves when made salient (Peetz & Wilson, 2013). Marketers might benefit from making such intervening events salient when promoting products or services with low concrete benefits but high identity-based value. For example, sustainable tourism, which perhaps involves less comfort and hedonic enjoyment than other types of holiday, but aims to benefit local communities and the environment, may seem more appealing when a decision-maker's intervening birthday is made salient.

Beyond how organisations may appeal to decision-makers, an important consideration is how decision-makers can be supported in making decisions that they will be satisfied with. For instance, a careers adviser dealing with an undergraduate who is highly embedded within student life, and therefore likely to see graduation as involving major self-change, should perhaps be particularly sensitive to ensuring that this student has considered the day-to-day realities of their planned career choice.

3.7. Conclusions

Evidence across four studies indicated that individuals tend to assign higher importance to future decision attributes that convey desirable self-characteristics when they perceive their present and future selves as dissimilar. While further research is required to establish causality, these findings have potential implications for individual decision-making during life transitions and other periods of anticipated self-change, and for marketers promoting products or services providing identity-based value but limited concrete benefits.

Chapter 4 – Postcards to a Future Self

4.1. Introduction

Research in this chapter adopted a more open-ended approach to examine how people conceptualise and relate to their future selves, and how this varies based on individual differences in psychological connectedness. To explore these topics, first-year undergraduates in their first week of university responded to psychological connectedness and future self-vividness measures, and completed a variation of a future self letter-writing task (e.g., van Gelder et al., 2013), in which they wrote a postcard to their graduating future self (Pownall, 2024). Pownall had previously developed this postcard writing task as an undergraduate induction activity, but did not report a formal analysis of postcard content, or administer psychological connectedness or future self-vividness measures. In describing her reflections on running the activity, Pownall notes that students often used their postcards to outline their goals and future plans, to reflect on past experiences, and to take stock of their current situation. A couple of illustrative postcard quotes reported by Pownall also hinted at a high degree of self-kindness and positive self-talk, with students complimenting themselves and expressing pride in their achievements.

Pownall's (2024) reflections indicate that the postcard task may generate valuable insight into how individuals conceptualise their future self and its link to present identity during a major life transition. While a number of other studies have also used future self letter-writing tasks, often as interventions to increase future-oriented behaviour (van Gelder et al., 2013; Rutchick et al., 2018; Quinten et al., 2020; Chishima & Wilson, 2021), these studies have rarely analysed letter contents - particularly in the context of a major life transition. In the present research, by analysing the content of students’ postcards and examining associations between postcard content and individual differences in psychological connectedness and future self-vividness, I aimed to contribute to the literature on psychological connectedness and life transitions in at least two ways. Firstly, by exploring how incoming undergraduates conceptualised their graduating future selves, I sought to establish further insight into the identity development and maintenance processes that are prevalent during the transition to university, such as they ways in which students may attempt to bolster self-continuity during this period of significant personal change. Importantly, the open-ended, relatively unstructured nature of the postcard-writing task allows students to express what is salient to them – unconstrained by researcher-imposed scales and theoretical frameworks. Secondly, linking postcard content to future self measures may provide new insight into what contributes to individual differences in psychological connectedness and future self-vividness during a major life transition, and how psychological connectedness may shape cognitive processes involved in thinking about the future.

In addition to theoretical relevance, this topic has potential practical implications. In particular, the transition to university (and other major life transitions) is associated with lower mental well-being, including increased stress, anxiety, and depression; and an increased propensity to engage in risky health behaviours (e.g., Deforche et al., 2015; Katz & Somers, 2017). If a future self postcard-writing task encourages expressions of kindness towards the self during a challenging period, or perhaps facilitates a form of self-reflective thinking that bolsters self-continuity (Habermas & Bluck, 2000; Habermas & Köber, 2015), it may be a useful intervention in supporting students’ transition to university.

Based on Pownall's (2024) reflections on running the postcard activity and wider theoretical considerations, below I further discuss three potential areas the present study may be expected to gain insight into: continuity and change through transition, future plans, and self-distancing and self-kindness.

1.1.1. Continuity & Change Through Transition

When starting university, students are often living away from home for the first time, leaving behind childhood friends, meeting new people from different backgrounds, and having novel experiences. These changes in day-to-life and circumstances can have significant implications for identity, with new and prospective undergraduates recognising university as an opportunity for a "fresh start", where unwanted past identities can be discarded and desirable new identities forged (Karp et al., 1998; Kiecolt & Mabry, 2000). While these changes seem largely desirable, they may nonetheless threaten perceived self-continuity - which individuals are strongly motivated to retain (e.g., Vignoles et al., 2006). Pointing to this potential ambivalence about self-change, in qualitative interviews of US high-school students preparing to leave for college, Karp et al. (1998) found that while students were excited about the chance to make new friends and redefine themselves, they were also apprehensive about leaving their old friends behind, and in some cases were concerned that they might change so much as a person that their family would not like who they had become.

While perceived or anticipated self-change may threaten one source of self-continuity (i.e. a sense of sameness or stability over time), this is not the only route through which self-continuity can be maintained (Chandler et al., 2003; Becker et al., 2018). People can also maintain a sense of continuity in identity, despite self-change, through the development of a narrative identity, which is a coherent, integrated story of how an individual became the person they today, and their expectations of who they might become in the future (Habermas & Bluck, 2000; Addis & Tippett, 2008; McAdams, 2008). Through *autobiographical reasoning* processes - a form of self-reflective thinking that entails contextualising and establishing meaningful links between important events, lifetime periods, and traits and characteristics of the self (Habermas & Bluck, 2000; Chandler et al., 2003), individuals can integrate perceptions of change into causally coherent self-narratives. For instance, self-change may be attributed to developmental trajectories (e.g., becoming wiser with age), or as a response to other autobiographical experiences (e.g., "I changed so much after going travelling") (Habermas & Bluck, 2000; Pasupathi et al., 2007)

Since major life transitions often involve significant self-change, autobiographical reasoning processes may be particularly important to maintaining self-continuity during these periods. Consistent with this idea, Habermas and Köber (2015) found that participants who had experienced more life transitions over the previous four years reported lower continuity between past and present selves, but this negative association was attenuated among individuals who engaged in more frequent autobiographical reasoning (e.g., explaining how previous events changed them as a person), suggesting a potential buffering effect (also see Dirghangi & Wong, 2022). Furthermore, in the context of the transition to university, Landau et al. (2014) found that first-year students who were primed to think about their progress through university as a physical journey reported a stronger sense of connection to their graduate future self (e.g., "I feel a strong connection between Today Me and Graduate Me"). Habermas and Bluck (2000) argued that metaphorically thinking of life as a journey can contribute to self-continuity by viewing self-change as congruent with a broader overarching trajectory. For example, thinking of life as a linear journey may connect the present self to an inferior past self (e.g., "I've come a long way since then"), and a desired future self (e.g., "I'm on the right path to being successful").

However, less is known about the autobiographical reasoning strategies that individuals may use spontaneously (i.e., not primed, *c.f.* Landau et al., 2014) *during* (i.e., not retrospectively assessed, *c.f.* Habermas & Köber, 2015) a major life transition, and how use of these strategies relates to psychological connectedness to a future self. One possibility is that lower psychological connectedness would be associated with an increased tendency to engage in autobiographical reasoning, in an attempt to restore self-continuity when it is threatened by anticipated self-change. However, it is also possible that individuals who have a greater propensity to engage in autobiographical reasoning are less likely to perceive significant dissimilarity to their future self to begin with. This is because this form of self-reflective thinking may highlight enduring personal traits and characteristics, such as particular high-level goals and values, therefore emphasising stable aspects of identity (Bluck & Habermas, 2000).

1.1.2. Future Plans

There are likely to be substantial individual differences in the extent to which incoming first-year students already have future plans for what they want to do after they graduate (e.g., a career, further education), and their level of commitment or certainty regarding these plans. Some students may be focused on their time at university, neglecting to consider what might come after. Others might not know what they want to do after university, but see figuring it out as an important task to be completed. Still others may have a clearly established career or post-graduate study goal, with their undergraduate course seen as a necessary step towards achieving that goal.

Salience or clarity of future plans after leaving university may contribute to individual differences in psychological connectedness. In particular, students with clear future plans may feel more similar to their future self, due to the sharing of important ambitions and motivations between selves. However, results from a study by Chishima and Wilson (2021) seem contrary to this suggestion. Chishima and Wilson asked adolescent participants to write a letter to their future self in three years, and to indicate on a three-point scale the extent to which they had written about various topics, including their current goals, and things they might be working on three years from now. Participants who reported writing more about what they might be working on in three years subsequently indicated a greater *reduction* in future self-connectedness compared to pre-test ratings a month earlier. One possible explanation for this is that reflecting on future plans and projects may highlight perceived discrepancies between present and desired future selves, therefore reducing perceived connectedness or similarity (e.g., Peetz & Wilson, 2013). However, since Chishima and Wilson (2021) did not look at participants' letters themselves (as students were assured that their letters would remain private), the precise nature of what students wrote about is not known. It is possible that students who wrote more about what they might be doing in three years were often reflecting on uncertainty and ambiguities about their life in the future, with this emphasis on an uncertain future perhaps decreasing perceived connectedness.

Away from psychological connectedness *per se*, the context provided by future plans may also facilitate a more vivid mental representation of a post-graduation future self. For example, a student who wants to be a primary school teacher can draw upon relevant semantic knowledge of this role to form a mental image relating to this future identity, such as themselves at the front of a classroom giving a lesson. Importantly, the context in which this future self is imagined makes the mental representation immediately recognisable as belonging to a post-graduation lifetime period. Conversely, students without clear future plans may lack a salient post-graduation context to imagine themselves in. Students could instead imagine themselves in a non-temporally specific context (e.g., eating at a restaurant), but – even if physical details of the self are vividly represented – this may lack a clear sense that it is the future self after graduation that is being pictured.

1.1.3. Self-Distancing & Self-Kindness

A notable aspect of writing a letter (or postcard) to an imagined future self is that it encourages individuals to refer to themselves using second-person pronouns (e.g., "you"). Kross and Ayduk (2017) propose that referring to the self in this way promotes a psychologically self-distanced perspective, with individuals thinking about the self as though it was a different person. If second-person pronoun use encourages people to conceptualise themselves as another person, this could perhaps explain the self-kindness and positive self-talk hinted at in Pownall's (2024) postcard-writing activity. In particular, if – as Neff (2023) suggests – people are often kinder and more compassionate to others than they are towards themselves, they may be more likely to express self-kindness (e.g., self-praise, non-judgemental), when writing about the self as though it was a different person.

In addition to second-person (or third-person) pronoun use in self-talk, Kross and Ayduk (2017) also conceptualise third-person mental imagery, where the self is pictured from the viewpoint of an outside observer (Nigro & Neisser, 1983), as a form of self-distancing. Indeed, studies examining self-distancing have frequently used visual perspective manipulations, with participants asked to recollect a past experience or imagine a future event using either third-person (self-distanced) or first-person (self-immersed) mental imagery (see Kross & Ayduk, 2017, for a review). Furthermore, pronoun use has been empirically linked to differing visual perspectives in autobiographical memory, with participants more likely to use third-person mental imagery after first reflecting on the event using second- or third-person (vs. first-person) self-talk (Kross et al., 2014).

Recall that in Chapter 2 of the present thesis, lower psychological connectedness was associated with increased use of third-person mental imagery during future thinking. Given the conceptual overlap between visual perspective in mental imagery and distanced self-talk (Kross & Ayduk, 2017), it therefore seems plausible that students would also be more likely to use second-person pronouns (e.g., “you”) when writing to a dissimilar (vs. similar) future self, and perhaps therefore more likely to express self-kindness. Interestingly, the only study I am aware of that has partly examined this question seemed to show evidence for the reverse association between psychological connectedness and pronoun use. Specifically, Quinten et al. (2020, Study 1) found that participants who referred to themselves in the second- or third-person (e.g., “Dear Future [name]”; “you”) when writing to their future self in 20 years reported higher future self-connectedness on a scale developed by the authors. However, a number of items in Quinten et al.’s novel eight-item future self-connectedness scale lacked face validity, making the observed association difficult to interpret. Example items in the connectedness scale were: “I am very concerned about myself 20 years from now”; “I feel responsible for myself 20 years from now”; “What I do now does not really affect myself 20 years from now”; “What I do now matters to myself 20 years from now”. The issue with the first two items is that they seem to tap into feelings of responsibility towards the future self rather than connectedness in terms of perceived similarity or overlap (or even a broader sense of self-continuity). The issue with the second two items is that it seems possible for individuals to recognise that their present behaviour will impact their future self without feeling a strong degree of connectedness to that self. For example, I may recognise that taking up smoking would affect my future health in 20 years while feeling entirely dissimilar and disconnected from this future self. Associations between more widely used psychological connectedness measures (Ersner-Hershfield et al., 2009a; Bartels & Urminsky, 2011), distanced self-talk, and self-kindness have yet to be examined.

1.1.4. The Present Study

The present research aimed to examine how students thought about their future self and its link to present identity during the transition to university, and how this varied based on individual differences in psychological connectedness and future self-vividness. This was examined by administering Pownall's (2024) postcard-writing task to a new intake of first-year Psychology undergraduate students, along with self-report measures of psychological connectedness and future self-vividness. I performed content analysis (Krippendorf, 2018) on students' postcards to examine content relevant to future self-representations and processes in identity development and maintenance. A hybrid of deductive and inductive approaches to content analysis was used (Fereday & Muir-Cochrane, 2006), with self-change, autobiographical reasoning, future plans, and self-kindness used as preliminary categories to be retained, revised or discarded (and new categories identified), based on the observed data. Additionally, automated text analysis was used to quantify how frequently participants used different types of pronouns (e.g., first-person singular, second-person). Associations were then examined between coded postcard content, pronoun use, and future self measures.

I hypothesised that lower psychological connectedness would be associated with decreased use of first-person singular pronouns and increased use of second-person pronouns – reflecting greater self-distancing (Kross & Ayduk, 2017). Additionally, exploratory hypotheses were proposed that participants who wrote about more concrete future plans would report higher psychological connectedness and future self-vividness, and participants reporting lower psychological connectedness would be more likely to express self-kindness (as a potential downstream consequence of greater self-distancing). The relationship between content relating to autobiographical reasoning and psychological connectedness was also of interest, though no direction was specified because negative and positive associations seemed equally plausible (as discussed in Section 4.1.1). Note that these hypotheses were exploratory because the *a priori* postcard content categories (i.e., autobiographical reasoning, future plans, self-kindness) were only preliminary, meaning I was not rigidly committed to retaining them (and therefore testing associations with self-report measures) if they had not seemed relevant in the observed data.

4.2. Method

4.2.1. Ethics

Ethics approval was obtained from the University of Nottingham School of Psychology Ethics Committee (ref. F1467).

4.2.2. Participants

Participants were first-year Psychology undergraduate students (n = 209) from the University of Nottingham, taking part in an induction session during welcome week.

Two participants were excluded from all analyses, one because their postcard was not written in English and another because their postcard contained no text – only a drawing. Of the remaining 207 participants, 176 reported their gender as female, 19 as male, 4 as non-binary or other, and 8 did not report their gender. 133 participants were White, 29 were Asian/Asian British, 15 were Black British Caribbean or African, 13 were mixed/multiple ethnicities, 9 as ‘other’, and 8 did not report their ethnicity. Ages ranged from 17-22 (*M* = 18.4, *SD* = 0.66).

4.2.3. Procedure and Materials

The study took place in a large lecture hall as part of an induction session for new undergraduate students. Each participant received an A6 sized postcard and a paper handout including a study information sheet for informed consent, instructions for the postcard task, demographic questions, and the future self measures.

The front side of the postcard had artwork depicting the University of Nottingham campuses and the reverse side was left blank for students to write a message to their future self. Following Pownall (2024), instructions for the postcard task stated that participants could write about whatever they wanted in their postcard to their graduating future self, with the following topics provided in case they were unsure what to write: (1) “What brings you to the University of Nottingham? Why Psychology?” (2) “What do you hope to do or achieve during your time at Nottingham?” (3) “Do you have goals and hopes for your time at university? What do these look like?” Students were asked to create a unique code using digits from their postcode, date of birth, and surname, and write this on their postcard so it could be returned to them in their final year. Students were told (in the information sheet and verbally) that if they consented to being part of the research study, they should place their postcard in one of the “post-boxes” that had been set up at the front of the lecture theatre. Participants were advised that if they did not consent to their postcard being used in the research project but still wanted to receive it back in their final year, they should give it directly to one of the staff members in the session, who would store it separately for them.

Future self-vividness was measured using two items from Bixter et al. (2020). Participants were asked "When you imagine your future self in three years, how vividly do you picture it?" (1 = Not at all vividly; 7 = very vividly) and "How easy is it for you to visualise a mental picture of your future self in three years?" (1 = very difficult; 7 = very easy). Responses to the two items were averaged into a composite measure of future self-vividness ($\alpha = .89$), where higher scores reflected greater perceived vividness.

Psychological connectedness to a future self was measured using future self-connectedness and similarity items (e.g., Bartels & Urminsky, 2011). For the future self-connectedness item, participants indicated how connected they felt to their future self in three years by selecting between six pairs of increasingly overlapping circles (labelled 'Person now' and 'Person in 3 years), where no overlap meant 'completely disconnected' and total overlap meant 'completed connected'. For the future self-similarity item, participants indicated how similar they felt to their future self in three years on a scale from 0-100 marked at 10-point intervals, where 0 meant 'completely different' and 100 meant 'exactly the same'. Participants who selected values in-between the 10-point intervals were assigned a score to the nearest five. As in Chapter 3, a composite measure of connectedness and similarity items did not have strong internal consistency ($\alpha = .62$), and items were therefore retained as separate measures.

Participants were given approximately 15 minutes to complete the postcard task and the future self measures.

4.3. Analytical Approach

4.3.1. Content Analysis

Students' handwritten postcards were manually transcribed. A hybrid inductive-deductive analytical approach to content analysis was used (Fereday & Muir-Cochrane, 2006), with several pre-conceived categories (self-change, autobiographical reasoning, future plans, self-kindness) guiding initial coding of the data, and additional codes and categories also identified and iteratively refined based on the observed data. After I had coded the entire dataset, an independent researcher (with no prior background to self-continuity and psychological connectedness literatures) was provided with a coding manual (Appendix F) containing the full list of codes, descriptions, inclusion/exclusion rules, and examples (Syed & Nelson, 2015). This independent researcher then performed second coding on a random sample of 50 postcards (~25% of the dataset) to assess interrater reliability. Cohen's kappa indicated substantial overall agreement ($\kappa = .75$). Reliability was notably weaker for an autobiographical reasoning category ($\kappa = .58$), though raw percentage agreement was high (91%). Discussion led to revision of the coding manual aiming to improve clarity by further subdividing codes within this category. The whole dataset was recoded on this basis and further second coding using a new set of 50 randomly selected postcards indicated improved interrater reliability ($\kappa = .80$) for the autobiographical reasoning category.

Each postcard was coded for the presence (1) or absence (0) of each code (i.e., postcards could be assigned multiple codes). The only exception to this dichotomous coding scheme was for a future plans category, where the coding scheme distinguished between postcards that did not mention future plans after university at all, and those expressing varying degrees of clarity or certainty about future plans (described in Section 4.4.1).

4.3.2. Postcard Pronoun Use Calculation

Pronoun use (first-person singular; second-person; first-person plural) was computed using Linguistic Inquiry and Word Count (LIWC; Boyd et al., 2022) software, which calculates the proportion of total words in an analysed text (i.e., a student's postcard) which belong to a particular category. LIWC output for the pronoun analysis therefore included three separate variables for each student, showing the proportion of total words in a postcard that were first-person singular (e.g., "I", "me"), first-person plural (e.g., "we", "us"), and second-person (e.g., "you") pronouns.

While in everyday usage, first-person plural pronouns typically refer to the self and another person, it was apparent from reading students' postcards that in this context they were most often used to collectively refer to present and future selves. To create a measure specifically capturing this type of use, all postcards containing first-person plural pronouns were reviewed to ensure that they referred to present and future selves rather than the self and others. Where a first-person plural pronoun referred to the self and others (e.g., "currently sat by [name] in our first lecture"), the participant's score was recalculated to exclude this usage. The final measure therefore indexed use of first-person plural pronouns in reference to present and future selves.

4.4. Results & Discussion

4.4.1. Content Analysis

Categories identified in the content analysis of the postcards to students' future selves, along with their description, illustrative quotes, and frequency are displayed in Table 4.1. The full list of codes within each category is shown in Appendix G.

Table 4.1

Summary of categories from content analysis

Categories	Sub-Categories	Description	Illustrative Quotes	*n*	%
Self-Continuity	Autobiographical Reasoning	Used metaphors describing progress through life as a journey; reflected on past experiences or wider autobiographical knowledge and how it relates to their present situation, goals, and expectations.	*"I know it's not going to be a linear journey but as long as I make it to the other side, I'm calling it a success"* *"And I know that seems impossible but I'm thinking of the little depressed girl I was back in prep, and I'm really impressed by how much I've grown."*	65	31
	Self-Stability	Expressed a hope or desire that goals, interests, values, relationships, or core identity would persist in a future self.	*"Never lose yourself and what is important"* *"Don't stop drawing, or give up on art"*	53	25
Growth & Self-Change		Expressed a desire for growth/self-improvement, or other expectations of self-change.	*"I hope I have had a good time and that I have worked on myself to be the best version of me"* *"I rlly wanna get better socially & I hope to feel more confident in social situations and in myself."*	79	38

Future Plans		Content relating to future plans after university (e.g., work or further education), and the concreteness of these plans. If present, coded as either no plans, tentative plans, or concrete plans.		90	43
	No plans	Mentioned that they do not know what to do after university	*"I also hope you have a plan of what you're gonna do after uni because right now I'm clueless."*	26	13
	Tentative	Mentioned a future plan that was vague, tentative, or described as liable to change.	*"Also, whats the plan now? Teacher? Therapist? or have you completed switched up."*	44	21
	Concrete	Mentioned a specific plan, without qualification or uncertainty.	*"This degree will help me achieve my future job which is a hospital clinical psychologist."*	20	10
Self-Praise/ Kindness		Praised or complimented themselves and their achievements, or expressed an intention to be kind to themselves in the future.	"*I hope you know how amazing you are."* *"So proud of you for doing it, after everything thats happened, you made it!"*	68	33

Goals & Expectations	Relationships & Belonging	Expressed an aim to make friends, fit in with others, and feel part of groups and communities, or feared failing to achieve these aims.	*"…get involved and be a part of societies. I will find my people, and make friends for life"* *"I hope you've found some great friends"*	119	57
	Enjoyment	Expressed hopes or expectations of making the most of the university experience, including having fun, novel experiences, and making memories.	*"It's my third day here at Nottingham, & I'm loving it so far. I really hope you had a great time here."* *"I hope I have made the most out of my years at Nottingham"*	97	47
	Achievement	Described goals to work hard and/or achieve success in academia, sport, or life beyond university.	*"Achieve a first class degree"* *"My dream as of right now is to work hard and put in the effort"*	89	43
	Campus & Nightlife	Mentioned nightlife, drinking, or the university campus/facilities	*"Hope you haven't been drunk every night because you were hungover writing this."*	45	22

Note. Numbers and percentages reflect how many postcards were coded for a category/sub-category. Percentages do not add up to 100 because each postcard could be coded for the presence of multiple content categories.

4.4.1.1. Self-Continuity

This category included two sub-categories of content corresponding with different ways in which individuals can maintain continuity in identity: autobiographical reasoning and self-stability (Habermas & Bluck, 2000; Chandler et al., 2003; Becker et al., 2018). The autobiographical reasoning category related to broader thematic or autobiographical connections between past, present, and anticipated future selves, with students describing progress through life metaphorically as a journey (Landau et al., 2014), or explaining their current circumstances, goals or expectations as causally linked to past experiences or their enduring traits and characteristics (Habermas & Bluck, 2000). The self-stability category reflected students' desire for important aspects of their current identity to persist into the future, perhaps attempting to maintain continuity by minimising expectations of significant personal change (Habermas & Bluck, 2000; Chandler et al., 2003).

Autobiographical Reasoning. Almost a third of postcards contained content coded for autobiographical reasoning. Most frequently in this category (n = 31), students wrote about their progress through university and beyond using the metaphor of a journey. For example, some students conceptualised their graduating future self as nearing the end of a journey that they were currently beginning (e.g., "*Today is the first day of university, 2nd I suppose. When you read this it will one of your last. Firstly, just by getting that far is incredible. Life throws shit at us but we still power through*" [P.170]). Others used journey metaphors when thinking about life beyond graduation, describing possible futures as paths they could choose to go down (e.g., "*I hope you…are confident in whatever path you have chosen to go down*" [P.171]), or that needed to be traversed in order to reach a goal (e.g., "*I want to [go] down the* *clinical psychologist route, very long and a lot of money but maybe it'll work out*" [P.43].

Some students reflected on past experiences and wider autobiographical knowledge to explain why they decided to come to Nottingham and study psychology, which was likely driven in part by the question prompts provided for the postcard-writing task (Section 4.2.3.1). These reflections sometimes involved relatively recent experiences (e.g., "*As soon as I got to campus, there was such a lovely atmosphere & I knew this was where I wanted to be (very cheesey)*" [P.39]), but occasionally stretched back much further back in time (e.g., "*It was always going to be Nottingham, from the time we first talked to dad about it in year 9 in a Costa and he told you 'oh that one's apparently really good'. And now here we are*" [P.56]). Similarly, some students viewed their decision to study psychology as a continuation of their long-standing interests (e.g., "*I chose to study psychology because it's a subject that has always interested me*" [P.47]). Reflections on past experiences were also occasionally used to inform future plans and expectations; for example, "*A first would be amazing but I dont want to put myself through A-levels again, definitely not worth it.*" [P.195].

Self-Stability. Around a quarter of students articulated a desire for stability in aspects of their identity, including goals and interests, values, important relationships, and a core sense of who they are as a person. These sentiments may reflect a motivation to maintain self-continuity by minimising expectations of significant personal change. This desire for self-stability was often expressed as a hope that aspects of current identity, such as key interests and ambitions, would persist in a future self (e.g., "*Right now we love psychology and hope that has stayed the same*" [P.102]). Other students were more forceful, conveying their desire for continuity as something more akin to a command ("*You better still be doing trampolining*" [Participant 185]). By expressing these hopes or commands, students seemed to recognise that their new life circumstances could bring about self-change that was not desirable from the perspective of the present self. Some students made this point explicitly, expressing a concern they might lose the core essence of their identity in an attempt to fit into their new environment (e.g., "*I hope I stay true to myself and not lose myself in an attempt to get people to like me*" [P.108]).

4.4.1.2. Growth & Self-Change

Despite the emphasis on a desire for stability described above, students also frequently expressed goals relating to growth and self-change. Students often wrote about their aim to become more confident (e.g., "*grow in confidence*" [P.177]), to improve their social skills (e.g., "*Hopefully your social skills have grown*" [P.121]), or become more independent (e.g., "*I hope my time at university builds upon my independence*" [P.178]). Outside of specific characteristics, some students mentioned a more general desire for self-growth (e.g., "*I really want to feel…like I've developed as a person during my time here*" [P.39]), or to move out of their "comfort zone". Highlighting the tension between a desire for change and continuity in identity during the transition to university (Karp, 1998), some students tempered their desire for self-growth with a caution about not changing so much that the core essence of who they are as a person is lost (e.g., "*I hope that I make friends for life and grow in self confidence whilst also never losing sight of myself*" [P.91]).

4.4.1.3. Future Plans

Over 40% of participants made some reference to their future plans after university. Some students said they did not know what they wanted to do (coded as 'no plans'). These students often expressed a hope that their future self will have figured it out, rather than being an issue they were actively attempting to address in the present (e.g., "*I also hope you have a plan of what you're gonna do after uni because right now I'm clueless*" [P.191]).

More frequently, students expressed a vague or tentative future plan (coded 'tentative plans'). Tentative future plans were often posed as questions to the future self (e.g., "*Have you decided whether you want to do Clinical or Educational Psychology?*" [P.1]). Additionally, students sometimes mentioned a particular plan but indicated they might change their mind (e.g., "*I want to do BSL + speech therapy after my degree but I will deffo change my mind. :)*" [P.207]).

Some students expressed a concrete, certain plan of what they wanted to do after university (coded as 'concrete plans'). These postcards often seemed to convey a greater sense of agency, with students stating what they planned to do rather than passively hoping their future self will have progressed these plans (e.g., "*I want to do a clinical psychology doctorate and be a clinical psychologist*" [P.40]).

4.4.1.4. Self-Praise/Kindness

As hinted at in work by Pownall (2024), a sense of self-praise and self-kindness was fairly common, mentioned by around a third of students. Students frequently praised their future self for graduating ("*Honestly big up for making to grad - kinda impressive of you - will give you that one*" [P.156]), and expressed pride in themselves (e.g., "*However well you did I'm proud of you. It's been your dream to study here & now you have*" [P.119]). Students also sometimes complimented themselves in general (e.g., "*You're amazin and you're gonna go far*" [P.8]), and reminded themselves that they are worthy of success and happiness (e.g., "*just remember you deserve all the best things in life*" [P.65]). Additionally, some students expressed an intention to show self-kindness and understanding in the future, not criticising themselves too harshly for their mistakes (e.g., “*I hope we arent too hard on ourself when we mess up*” [P.105]).

4.4.1.5. General Goals & Expectations

Students frequently mentioned personal goals regarding what they hoped their experience of university would be like. These were typically expressed as desired outcomes that the student hoped to achieve, but were also occasionally framed as a negative possible future that they hoped to avoid (e.g., “*I hope I find friends that I trust and am comfortable with, because ideally I don't want to be lonely or miserable! I just hope I do not drop out*” [P.73]).

Relationships and Belonging. The most frequently reported category in the content analysis, mentioned by 57% of students (Table 4.1) related to an aim to form relationships and to fit in with others and the wider university community – closely reflecting Vignoles et al.’s (2006) proposed identity motive of belonging, which refers to a desire to establish close relationships and feel accepted by others. Many students clearly expressed a desire to make friends or meet people, and to establish relationships that would endure beyond their time at university (e.g., “*I hope youve made some life long friends!*” [P.163]). Aside from specific relationships, students also mentioned that they wanted to feel at home in Nottingham (e.g., “*I hope you've found your people and feel at home here*” [P.166]), and to be a part of the university community, perhaps by getting involved in clubs and societies (e.g., “*I hope to meet lots of people here and get involved in as much as possible, especially within psych*” [P.107]).

Enjoyment. Many students emphasised that they wanted to enjoy the university experience. Students hoped to enjoy university in general (e.g., “*I hoped you enjoyed your time at UON and that it was all you wanted it to be*” [P.53]), and their course in particular (e.g., "*I hope to really enjoy the psychology degree*" [P.161]). Students also described a desire to "make the most it", "try new things", and to go through the full "university experience". Some students also expressed a hope that they would make important memories while at university (e.g., "*I hope you have enjoyed the years at uni and have lots of fun memories to look back on*" [P.197]).

Achievement. Content in the achievement category referred to students' goals of working hard and achieving personal success. Most commonly in this category, participants mentioned academic achievement, such as a specific grade they hoped to achieve (e.g., "*you better get a first*" [P.11]), which they sometimes linked to working hard ("*I hope to finish 1st. I wanna use my competitive side and I intend to work my arse off to be the best"* [P.124]). Some students instead hoped to achieve success in sporting activities (e.g., "*you better be in the netball first team by now*" [P.108]), while others had a less specific goal, hoping more generally that they would become rich in the future (e.g., "*You also better be rich in the future or I'll be very upset*" [P.201]). Additionally, several students appeared to view hard work as a goal in itself, rather than a means to achieve some other outcome (e.g., "*My goals are to be extremely hardworking throughout my time at university, putting effort into all work that I do*" [P.178]).

Campus and Nightlife. Over a fifth of students made reference to nightlife (e.g., "*Night off tonight because im hanging*" [P.76]; "*Do you prefer pubs or clubs????*" [P.29]), and to the campus and facilities at the university (e.g., "*I like the campus, facilities and also the course structure*" [P.158]).

4.4.2. Correlation Analyses

4.4.2.1. Coded Postcard Categories and Future Self-Measures

Correlations between future self-vividness, connectedness, similarity, and coded postcard categories are displayed in Table 4.2. Only the future self-vividness measure was significantly associated with any of the coded postcard categories. Amongst students mentioning future plans after university, more concrete plans were associated with a more vivid representation of the future self (Table 4.2). This could potentially reflect either that having clear plans for the future enables students to visualise their future self more vividly, or that being able to visualise a future self more vividly strengthens commitment to future plans (see McMichael & Kwan, 2023).

Additionally, students who engaged in autobiographical reasoning reported being able to imagine their future self more vividly (Table 4.2). There are several possible explanations for this relationship. Firstly, since journey metaphors were the most frequent code within the autobiographical reasoning category, the relationship could reflect that people with stronger mental imagery abilities are more likely to use metaphorical language. However, contrary to this view, previous research has shown no correlation between metaphor usage frequency and individual differences in vividness of mental imagery (Fetterman et al., 2016, Study 2). Secondly, stronger mental imagery abilities may facilitate narrative thinking by enabling individuals to recall past events and imagine future events with greater clarity. Thirdly, individuals may be able to more vividly imagine a future self that is causally linked to present identity through the development of overarching life narratives.

Note that significant future self-vividness correlations with coded postcard categories were largely unchanged after controlling for word count: autobiographical reasoning,

$r_p(195) = .17$, $p = .017$; achievement, $r_p(195) = .14$, $p = .052$; future plans, $r_p(81) = .29$, $p = .009$.

Table 4.2

Zero-order correlations between coded postcard categories and future self measures

Category	**Vividness** (n = 198)	**Connected** (n = 188)	**Similarity** (n = 190)
Self-Stability	.05	.09	.13
Autobiographical Reasoning	.19**	.05	.04
Growth & Self-Change	.03	-.06	-.01
Relationships & Belonging	.03	-.11	-.01
Achievement	.15*	.05	.10
Enjoy Yourself	-.01	-.07	.04
Future Plans[a]	.25*	.14	.20
Self-Praise/Kindness	.08	.07	-.05
Mean	3.53	3.34	51.84
SD	1.29	1.00	16.05

Note. Connected = future self-connectedness; Similarity = future self-similarity.

Except those involving the future plans measure, correlations reported are point-biserial, where postcard content categories were coded as 0 = absent, 1 = present.

[a] Future plans correlations based on the subsample of students coded as having no plan (0), a tentative plan (1), or a concrete plan (2). Samples sizes for these particular correlations were as follows: vividness: n = 84; connectedness: n = 82; similarity: n = 79).

* $p \leq .05$ ** $p \leq .01$

4.4.2.2. Pronoun Use Associations

Descriptive statistics for pronoun use variables and correlations with coded postcard categories and future self measures are displayed in Table 4.3. First-person plural pronouns (e.g., “we”, “us”) were relatively infrequent, used by only 46 students. 152 students used at least one second-person pronoun (e.g., “you”), and 193 students used at least one first-person singular pronoun (e.g., “I”, “me”). Pronoun use variables were highly skewed (especially the first-person plural measure), and significantly correlated with word count, with longer postcards associated with an increased proportion of first-person singular, $r_s(205) = .28$, $p < .001$, and first-person plural, $r_s(205) = .21$, $p = .002$, pronouns. Therefore, Spearman’s rank partial correlation coefficients are reported, controlling for word count (Table 4.3).

Presence of self-praise/kindness content was significantly associated with each of the pronoun use measures (Table 4.3), predicted by lower use of first-person singular pronouns and increased use of first-person plural and second-person pronouns. Additionally, students made greater use of second-person pronouns and less use of first-person singular pronouns in postcards expressing a desire for self-stability (Table 4.3), while first-person plural pronouns were also less frequent in postcards coded for growth/self-change and enjoyment categories (Table 4.3).

Table 4.3

Spearman's rank correlations between pronoun use, future self measures, and coded postcard categories (controlling for word count)

Category	1P Singular	1P Plural	2P
Coded Postcard Content			
Self-Stability	-.16*	.08	.23**
Autobiographical Reasoning	.06	.02	.06
Growth & Self-Change	.07	-.21**	.07
Relationships & Belonging	-.04	.001	-.04
Achievement	.08	-.04	.08
Enjoy Yourself	.10	-.15*	.10
Future Plans[a]	.03	.08	-.17
Self-Praise/Kindness	-.16*	.15*	.29***
Future Self Measures			
Vividness	-.11	.03	.03
Connectedness	-.15*	.15*	.12
Similarity	.09	-.14*	-.03
Descriptive Statistics			
Median	6.67	0.00	4.26
IQR	6.18	0.00	8.41
Range	18.18	10.26	16.83

Note. 1P = first-person pronouns, 2P = second-person pronouns, IQR = interquartile range; Connected = future self-connectedness; Similarity = future self-similarity.

n = 207 for correlations, except those involving the future plans category.

[a] Future plans correlations based on the subsample of students (n = 90) coded as having no plan (0), a tentative plan (1), or a concrete plan (2).

* $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$

Correlations with Future Self Measures. First-person singular pronoun use was negatively correlated with future self-connectedness, while the association with future self-similarity was positive, but not significant (Table 4.3). Conversely, first-person plural pronoun use had a significant negative correlation with future self-similarity, and a significant positive correlation with future self-connectedness. Neither future self-connectedness nor similarity were associated with second-person pronoun use.

The contrasting associations of future self-connectedness and similarity measures with first-person singular and plural pronoun use were surprising but adds to an emerging body of evidence that these measures have divergent relationships with certain constructs (Zhao et al., 2022; Ganschow et al., 2024). To more fully examine independent effects of future self-connectedness and similarity on pronoun use measures, I conducted multiple linear regression analyses[3].

Separate multiple linear regression analyses were conducted on first-person singular and first-person plural pronoun use measures, with future self-similarity, future self-connectedness, and word count (as a covariate) simultaneously entered as a predictors. For the regression on first-person singular pronoun use, the overall model was significant, $F(3, 179) = 10.06$, $p < .001$, adjusted $R^2 = .13$. Future self-connectedness had a significant negative association with first-person singular pronoun use ($b = -0.89$, $SE = 0.31$, $p = .005$), while future self-similarity had a significant positive association ($b = 0.05$, $SE = 0.02$, $p = .012$). Word count also had a significant positive association with first-person singular pronoun use ($b = 0.04$, $SE = 0.01$, $p < .001$).

For the regression on first-person plural pronoun use, the overall model was significant, $F(3, 179) = 4.21$, $p = .007$, adjusted $R^2 = .05$. In this model, future self-connectedness had a significant positive association with first-person plural pronoun

[3] The significance of results was not changed when examined using ordinal logistic regression.

use ($b = 0.38$, $SE = 0.15$, $p = .012$), while future self-similarity had a significant negative association ($b = -0.03$, $SE = 0.01$, $p = .006$). Word count was not a significant predictor ($b = 0.004$, $SE = 0.004$, $p = .23$).

Results therefore indicated that students who felt a stronger sense of connectedness with their future self were more likely to refer to present and future selves using first-person plural pronouns, and less likely to use first-person singular pronouns. Conversely, students who perceived their future self as highly similar to their current self tended to use first-person singular pronouns more frequently, and were less likely to refer to present and future selves collectively using first-person plural pronouns. One possible explanation for these findings is that perceived similarity may determine the extent to which individuals differentiate between present and future self-representations, while connectedness may reflect the extent to which a future self is seen as relevant to - and interconnected with - present identity (Peetz & Wilson, 2008; Oyserman, 2015). This aligns with the idea that close others may be viewed as part of the self-concept, even if they are perceived as dissimilar in terms of personal traits and characteristics (Aron et al., 1992; Peetz & Wilson, 2008). Linking this to pronoun use measures, when present and future selves are expected to be highly similar, they may be mentally represented as the same self, meaning there is no “we” to refer to, only a “me”. Conversely, when significant self-change is anticipated, people may hold distinct temporal self-representations that could potentially be represented as “we”, providing that the future self feels sufficiently interconnected and relevant to present identity.

4.4.3. Limitations

Several limitations of the present research are important to consider. Firstly, the sample consisted entirely of (primarily female) first-year Psychology undergraduate students at the University of Nottingham, who were in their first week of university. It is possible that the content of postcards would differ between universities and courses. For instance, students on courses that are more closely linked to a specific career (e.g., nursing) may have generally clearer future plans than the present sample. Additionally, students drawn to study psychology may be the type of individuals who are more likely to engage in self-reflective thinking, which may have contributed to the prevalence of certain categories, such as autobiographical reasoning or self-growth. Furthermore, it may be interesting for future work to compare the content of future self postcards across year groups. For example, if the expression of autobiographical reasoning content (e.g., journey metaphors) in students' postcards reflected an attempt to restore self-continuity during a major life transition, as I have suggested it might, this content should perhaps be less frequent among students at the beginning of their second year, as they are likely to be more embedded within university life by then.

Secondly, while novel associations were observed between first-person plural pronoun use and future self-connectedness and similarity measures, and between future self-vividness and engagement in autobiographical reasoning, these analyses were largely exploratory, and await confirmatory testing in an independent sample.

Thirdly, unfortunately time restrictions of the session did not permit the administration of a larger range of measures related to future thinking and self-identity, such as the self-concept clarity scale (Campbell et al., 1996) or specific self-continuity measures (Hong et al., 2024).

4.5. Conclusions

The present research indicated that while students first starting university often hope for change and self-growth, there are also ways in which they appear to seek continuity; either through a consciously expressed desire for important identity-relevant characteristics to persist in a future self, or by drawing narrative connections between different life stages – particularly using the metaphor of a journey to reflect on their progress through university and beyond. Novel evidence was provided that participants who engaged in such autobiographical reflections reported being able to imagine their graduating future self more vividly. Additionally, future plans beyond university were salient to many students, but expressed with varying degrees of clarity, with more concrete plans associated with more vivid future self-representations. Interestingly, future self-similarity and connectedness appeared to relate to different forms of perceived relationships between present and future self-concepts, with participants who felt highly *connected* but *dissimilar* to their future self less likely to write in the first-person singular ("I") and more likely to write in the first-person plural ("we"); adding to growing evidence that these future self measures may tap into distinct constructs in certain contexts.

Chapter 5 – Perspective-Taking in Intertemporal Trade-Offs

5.1. Introduction

In Section 1.5.2 of the literature review, I argued that if thinking about a future self sometimes resembles thinking about a different person (e.g., Pronin & Ross, 2006; Ersner-Hershfield et al., 2009b), social-cognitive processes (e.g., perspective-taking) that facilitate generosity towards others (e.g., Tusche et al., 2016) may also contribute to decisions which benefit the future self. I further proposed a novel hypothesis that individual differences in social-cognitive abilities may be especially relevant to future-oriented decisions when present and future selves are perceived as more dissimilar. In other words, processes that promote generosity towards others may facilitate a willingness to make sacrifices for a future self that is cognitively represented – to some degree – as an 'other' (Hershfield & Bartels, 2018). The present study tested these relationships by having participants complete a battery of measures including psychological connectedness, cognitive-behavioural and self-report measures of perspective-taking, and an intertemporal choice task.

In the remainder of the introduction, I first recap evidence from Section 1.5.2 which points to involvement of perspective-taking in intertemporal decision-making, and then elaborate on my hypothesis that individual differences in perspective-taking abilities may be more strongly associated with willingness to defer rewards when the beneficiary is a more dissimilar future self.

5.1.1. Perspective-Taking and Intertemporal Choice

Evidence for involvement of perspective-taking processes in intertemporal decision-making is currently based mainly on neuroimaging data. These neuroimaging studies have shown increased activity in the temporoparietal junction (TPJ) when individuals select delayed monetary rewards in intertemporal trade-offs (e.g., "would you prefer £50 today or £100 in a year?") (Soutschek et al., 2016, 2020; O'Connell et al., 2015; 2018), with the TPJ also believed to be crucial for perspective-taking of others (Saxe & Kanwisher, 2013). TPJ appears to be particularly important for perspective-taking when an individual attempts to mentally represent an alternative perspective that conflicts with their own perspective in the here-and-now (Saxe & Kanwisher, 2013; Quesque & Brass, 2019). For example, if I can see an object that is obscured from your field of view, to accurately represent what you see, I must set aside my own highly salient current self-perspective (Samson et al., 2010). Children under two have great difficulty with such tasks (Moll & Tomasello, 2006), and even adults find it challenging to entirely ignore their own viewpoint, with interference from the self-perspective referred to as *egocentric bias* (Epley et al., 2004; Samson et al., 2010).

In addition to intertemporal choice and perspective-taking, TPJ also appears to be involved in prosocial decision-making (Morishima et al., 2012; Strombach et al., 2015; Hutcherson et al., 2015; Tusche et al., 2016; Soutschek et al., 2016; Langenbach et al., 2022). For example, fMRI research by Tusche et al. (2016) had participants choose how much of a monetary endowment to donate to a charity, and to report the extent to which they engaged in perspective-taking while making their decision ("how much did you try to take the perspective of the beneficiaries of the charity?"). Results indicated that increased activity in TPJ correlated with more generous donations and higher self-reported perspective-taking during decision-making.

Establishing causal evidence for the role of TPJ across these multiple functions, Soutschek et al. (2016) found that after receiving inhibitory transcranial magnetic stimulation (TMS) to TPJ, participants were less patient in an intertemporal choice task, less generous in a self-other monetary allocation task, and more egocentrically biased in a visual perspective-taking task. Involvement of TPJ across these tasks has led some researchers to posit that this brain region contributes to an ability to switch away from the salient current self-perspective so that an alternative perspective can be represented (Strombach et al., 2015; Soutschek et al., 2016; O'Connell et al., 2018). According to this account, the ability to set aside the current self-perspective (i.e., to overcome an egocentricity bias) allows individuals to focus on receipt of rewards from the perspective of a psychologically distant agent – whether another person or a future version of the self (Soutschek et al., 2016).

However, despite accumulating neuroimaging evidence, there has been far less investigation into whether perspective-taking abilities and intertemporal decision-making are related at a behavioural level. In other words, do better perspective-takers make more future-oriented decisions? One study by Soutschek et al. (2016) did examine this question in a small sample (n = 59) alongside neuroimaging methods, finding supportive evidence that participants who had greater difficulty (i.e., were more error-prone) representing a visual perspective which conflicted with their own also displayed increased temporal discounting (i.e., a reduced preference for future vs. present rewards). However, low egocentric bias in Soutschek et al.'s (2016) measure could not be distinguished from high *altercentric bias*[4], which is the tendency for individuals to spontaneously consider the perspective of others, which interferes with judgements made from the self-perspective (Samson et al., 2010). Previous research has shown that higher altercentric bias is associated with increased

[4] Soutschek et al. (2016) reported a measure of egocentric bias based on a difference-in-difference score, reflecting the extent to which a participant was more egocentric than altercentric, not their egocentrism *per se*.

empathic concern (Nielsen et al., 2015), and increased empathic concern has been linked with lower temporal discounting (Sharma & Khan, 2022). Soutschek et al.'s (2016) findings could therefore potentially be explained by associations between altercentric bias and intertemporal decision-making (perhaps indirectly due to a joint correlation with empathic concern), rather than a greater ability to shift away from the current self-perspective to consider an alternative viewpoint.

Sharma and Khan (2022) interpreted the relationship between empathic concern and future-oriented decision-making as suggesting that individuals who experience more empathy towards other people are also more empathic towards their future selves, and therefore more likely to act in their future interests. It may similarly be expected that trait differences in perspective-taking tendencies would be associated with intertemporal choice, as individuals with a higher propensity for perspective-taking of others may be more likely to consider the perspective of their future self. Contrary to this idea, Sharma and Khan (2022) did not find a significant relationship between trait perspective-taking tendencies and temporal discounting, though this null finding may be considered inconclusive given the sample size of only 35 participants in this study.

5.1.2. Psychological Connectedness and Perspective-Taking

Relevant to my argument that individual differences in perspective-taking abilities may particularly contribute to future-oriented choices when present and future selves are perceived as dissimilar, neuroimaging research has shown greater TPJ activity when the beneficiary of a patient or generous decision is more psychologically distant from the present self. In particular, in an fMRI study, Strombach et al. (2015) had participants complete a social discounting task, in which they made a series of decisions about how much of a monetary reward to share with another person at varying degrees of social distance from the self (e.g., parent, best friend, colleague, stranger). Results showed higher activation in TPJ for generous vs. selfish decisions, particularly when decisions involved a more socially distant other. Strombach et al. suggest that cognitive processes involved in shifting focus from the self-perspective are more strongly recruited when the temptation to be selfish is greater, such as when the potential beneficiary of one's generosity is more psychologically distant. Extending this idea to intertemporal trade-offs, Soutschek et al. (2016) found that disrupting neural processing in TPJ particularly diminished future-oriented decisions for choices involving longer delays and therefore more temporally distant future selves.

Together, Strombach et al.'s (2015) and Soutschek et al.'s (2016) findings suggest the capacity to shift away from a current self-perspective particularly contributes to patient or generous decisions when the beneficiary is more psychologically distant from the here-and-now – either a more socially distant other or a more temporally distant future self. Since a dissimilar (or disconnected) future self could potentially be viewed as more psychologically distant from the present self (Maglio, 2020), these findings are consistent with the idea that perspective-taking abilities may more strongly contribute to future-oriented decisions among individuals reporting lower psychological connectedness.

5.1.3. Present Study

The aim of this study was to investigate whether individual differences in perspective-taking abilities contribute to intertemporal decision-making outcomes, and whether this relationship is moderated by psychological connectedness. Participants completed an intertemporal choice task involving hypothetical monetary rewards, a visual perspective-taking task assessing egocentric bias (Samson et al., 2010), and self-report measures of perspective-taking, empathic concern, and psychological connectedness. It was hypothesised that (1) higher perspective-taking abilities (reflected by lower egocentric bias, and higher self-reported perspective-taking and empathic concern) would be associated with lower temporal discounting (i.e., an increased preference for future rewards); (2) higher psychological connectedness to a future self would be associated with lower temporal discounting; and (3) higher perspective-taking abilities would be more strongly associated with an increased preference for future rewards among participants reporting lower psychological connectedness. Study hypotheses, sampling plan, and analyses were pre-registered with the Open Science Framework (https://osf.io/dyw5t).

5.2. Method

5.2.1. Ethics

Ethics approval was obtained from the University of Nottingham School of Psychology Ethics Committee (ref. S1458).

5.2.2. Participants and Statistical Power

An *a priori* power calculation was conducted in G*Power (Faul et al., 2007), based on an effect size of $r = .20$, alpha of .05, and target statistical power of .85, to detect an association between perspective-taking abilities and preference for future rewards in an intertemporal choice task. This yielded a required sample of 221 participants, which was increased to 240 to account for potential exclusions. Although Soutschek et al. (2016) had previously reported a correlation of $r = .30$ between visual perspective-taking performance and temporal discounting, this was based on a small sample, so the true effect size could substantially differ. Note that the target sample size in the present study also had over 95% power to detect a correlation between psychological connectedness and temporal discounting, based on effect sizes reported by Ersner-Hershfield et al. (2009a).

Data were collected from 235 participants (51% female), with an age range of 18-80 years (*M* = 40.6, *SD* = 13.5). Five additional participants completed the study, but their responses failed to save.

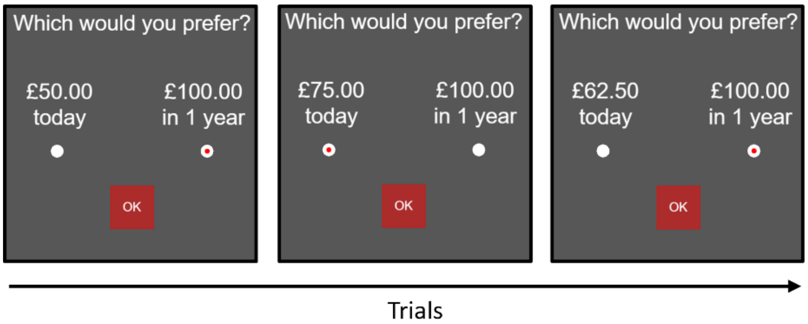
5.2.3. Measures

5.2.3.1. Temporal Discounting

Participants made hypothetical monetary choices between receiving a smaller amount of money today or £100 after a specified delay, with immediate reward value adjusted upwards or downwards on each trial depending on the participant's decision on the previous trial (Du et al., 2002). This procedure estimated the point at which a participant was indifferent between receiving an immediate or delayed reward at varying delay lengths (1 week, 1 month, 6 months, 1 year, 5 years) (see Fig. 5.1).

Figure 5.1

Intertemporal choice task example trials



Note. On the first trial of each block, participants were presented with a £50 immediate reward on the left-hand side of the screen and a £100 delayed reward on the right-hand side of the screen. The delayed reward value was fixed at £100 for each trial, whereas the immediate reward started at £50 for each block and was adjusted upwards if a participant selected the delayed reward and downwards if they selected the immediate reward. The first adjustment was £25, and subsequent adjustments were half of the previous adjustment amount. Participants made a total of six decisions for each delay block. All participants completed the delay blocks in the same order (1 week, 1 month, 6 months, 1 year, 5 years).

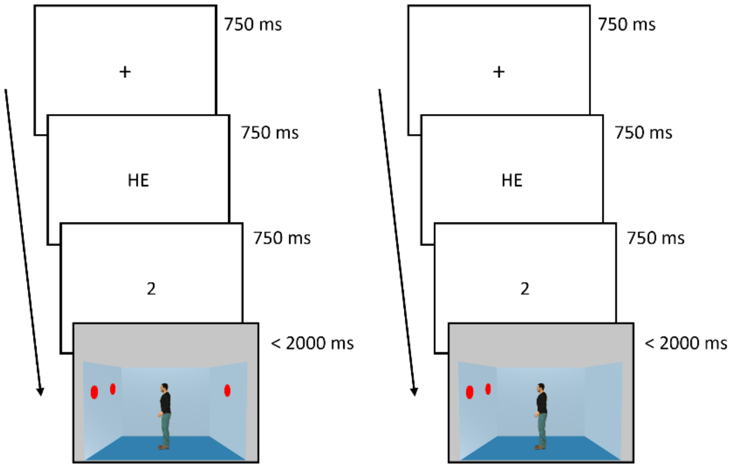
Indifference points for each delay were used to calculate an area under the curve (AUC) measure of temporal discounting. AUC is a theoretically neutral measure which does not make an assumption about the shape of the discount curve, and tends to produce normally distributed data (Myerson et al., 2001). A limitation of AUC is that it is disproportionately based on participants' indifference points at longer delays, so values reported here were calculated by applying an ordinal transformation to delay length, as advised by Borges et al. (2016). Higher AUC reflects *lower* temporal discounting; that is, greater patience or an increased preference for future rewards.

5.2.3.2. Visual Perspective-Taking

The dot perspective task was used to quantify egocentric bias (Samson et al., 2010), where lower egocentric bias reflects a greater ability to set aside the current self-perspective to adopt an alternative perspective. This task was used in related neuroimaging research by Soutschek et al. (2016) and correlates with other measures of perspective-taking (e.g., Kanske et al., 2015). The procedure for this task followed Samson et al. (2010), briefly summarised here. Participants were asked to verify the number of red dots visible in an image of a room, either from their own perspective (self-perspective trials) or the perspective of a human avatar standing in the centre of the room (other-perspective trials). On some trials the participant and avatar could see the same number of dots (consistent trials), while on other trials some of the dots were visible to the participant but not the avatar (inconsistent trials). Additionally, the number of dots visible from the target perspective either matched a number presented in a preceding cue (matching trials) or did not match (mismatching trials) (see Fig. 5.2). Participants completed 208 trials, split equally across four blocks. In a departure from Samson et al. (2010), block order was not counterbalanced across participants, based on recommendations for individual differences research (Goodhew & Edwards, 2019). Participants first completed 26 practice trials, with trial feedback given during this practice block but not during the four main blocks.

Figure 5.2

Trial structure of the visual perspective-taking task



Note. Participants were presented with a fixation cross, followed by a cue indicating whether they should respond from their own perspective or the avatar's. The number of red dots to verify was then presented, followed by the image of the room. Participants then had 2000 ms to press one of two keys to indicate whether or not the number of dots visible from the target perspective matched the previously cued number. Non-responses were coded as errors. **(Left)** Example of a matching (i.e., dots visible from the target perspective match the prior digit cue), inconsistent, other-perspective trial. (**Right)** Example of a matching, consistent, other-perspective trial.

Response time (RT) and error-rate measures of egocentric and altercentric bias were calculated, which represented inconsistency effects (i.e., inconsistent – consistent trials) for other-perspective and self-perspective trials, respectively (e.g., Tei et al., 2019). Following Samson et al. (2010), only matching trials were included in analyses, and only correct responses were used to calculate mean RTs. Egocentric bias on this task reflects interference from one's conflicting self-perspective when responding from the avatar's perspective, while altercentric bias is often taken as evidence for spontaneous perspective-taking, as it suggests that the avatar's perspective is calculated even when it is not task-relevant (Samson et al., 2010).

Table 5.1 shows the split-half reliabilities for egocentric and altercentric bias measures, computed using the *splithalf* package in *R*, based on a permutations-based approach with 5000 random splits of the data (Parsons, 2021). Split-half reliabilities were weak for both RT and error-rate measures. Trimmed RTs (see Table 5.1) produced substantially higher reliability estimates, albeit still not strong. The RT analyses reported here are based on untrimmed RTs, though using trimmed RTs did not alter the significance of the results.

Table 5.1

Spearman-Brown-corrected split-half reliability estimates

Measure	RT	ER	Trimmed RT
Egocentric Bias	.30 [.15, .44]	.46 [.32, .58]	.58 [.48, .67]
Altercentric Bias	.18 [-.01, .35]	.27 [.08, .44]	.46 [.32, .58]

Note. RT = response time; ER = error-rate.

Trimmed RT excludes trials ±2 *SD* from each participant's mean RT by condition.

95% confidence intervals in brackets.

5.2.3.3. Self-Reported Perspective-Taking and Empathic Concern

The interpersonal reactivity index (IRI) was administered as a self-report measure of perspective-taking and empathic concern (Davis, 1980). The IRI has 28 items, with seven items across each of four sub-dimensions (perspective-taking, empathic concern, personal distress, and fantasy – with the first two sub-dimensions of primary relevance here). Responses to each item were provided on a five-point scale (1 = does not describe me well at all; 5 = describes me very well) and scores were combined across relevant items to create perspective-taking and empathic concern scales (α = .84 and α = .83, respectively).

5.2.3.4. Psychological Connectedness

Participants indicated how connected and similar they felt to their future self 10 years from now, with both items measured on Ersner-Hershfield et al.'s (2009a) seven-point overlapping circles scale. Unlike studies in Chapter 3 and Chapter 4, similarity and connectedness measures had high internal consistency ($\alpha = .86$) in the present study and were therefore combined into a composite psychological connectedness scale.

5.2.3.5. Subjective Socioeconomic Status

A measure of subjective SES was taken from participant data held in Prolific. Upon signing up to Prolific, participants completed the MacArthur scale of subjective social status - indicating on a scale from 1-10 where they would place themselves on the socioeconomic ladder (Adler et al., 2000). This measure has demonstrated adequate test-retest reliability and has been linked to health outcomes even more closely than objective SES (Operario et al., 2004); perhaps because it captures an individual's social position more precisely than objective measures (Singh-Manoux et al., 2005), or because the *perception* of one's relative position in a social hierarchy itself influences individual decision-making and behaviour (Sheehy-Skeffington, 2020).

5.2.4. Procedure

Participants were recruited through Prolific (https://www.prolific.co/) and paid £4 to participate in a 30-minute study. Pre-screening criteria were a minimum approval rating of 90, and up-to-date information held in Prolific for household income and subjective SES. The balanced sample feature in Prolific was used to recruit an approximately equal number of male and female participants.

After providing informed consent, participants were directed to an online study created in PsychoPy (Peirce et al., 2019) and hosted on Pavlovia (https://pavlovia.org/). All participants completed the tasks in the following order: intertemporal choice, visual perspective-taking, IRI, future self-continuity. See Appendix H for specific wording of task instructions.

5.3. Results

5.3.1. Exclusions

Following pre-registered criteria, participants were excluded if their accuracy was below 75% in the visual perspective-taking task, if their indifference point for any given delay length in the intertemporal choice task was higher than their indifference point for the preceding (shorter) delay by more than 20% of the delayed reward value, or if they displayed no additional discounting at the maximum delay relative to the minimum delay (Johnson & Bickel, 2008). This resulted in 31 exclusions. Four participants were additionally excluded as they appeared to restart the study from the beginning part-way through, leaving a total of 200 participants.

5.3.2. Correlations and Descriptive Statistics

Correlations and descriptive statistics are reported in Table 5.2. Neither egocentric bias error-rate, $r(198) = -.14$, $p = .046$, nor egocentric bias RT, $r(198) = .02$, $p = .75$, were significantly correlated with the AUC measure of temporal discounting, after applying a Bonferroni correction for multiple comparisons (adjusted $\alpha = .025$). Furthermore, AUC was not associated with either self-reported perspective-taking or empathic concern sub-scales of the IRI. The psychological connectedness scale was also not significantly correlated with AUC (Table 5.2) (*c.f.* Ersner-Hershfield et al., 2009a), nor were the individual future self-similarity, $r(198) = .06$, $p = .41$, or connectedness measures, $r(198) = .08$, $p = .28$.

Table 5.2

Correlations and descriptive statistics

Variable	1	2	3	4	5	6	7	8
1. AUC	1							
2. Ego (RT)	.02	1						
3. Ego (ER)	-.14	.14	1					
4. Alter (RT)	-.11	.14	.23**	1				
5. Alterc (ER)	-.07	.10	.36**	.18*	1			
6. PC Scale	.07	.07	-.06	.05	-.09	1		
7.IRI-EC	-.07	.11	-.02	-.03	.03	.18**	1	
8. IRI-PT	.03	-.03	-.09	-.05	-.004	.25**	.45**	1
Mean	0.67	68.9	1.4	40.2	0.9	4.6	3.9	3.6
SD	0.20	74.9	2.0	76.2	1.9	1.7	0.6	0.7

Note. AUC = area under the curve; RT = response time (in milliseconds); ER = error-rate; PC = psychological connectedness; IRI = interpersonal reactivity index; EC = empathic concern; PT = perspective-taking.

$^{*}p < .05$ $^{**}p < .01$

5.3.3. Moderation by Psychological Connectedness

Multiple linear regression analyses were conducted to test the hypothesis that individual differences in perspective-taking would be more strongly associated with temporal discounting (AUC) among participants reporting lower psychological connectedness[5] to their future self. The following interactions with psychological

[5] The significance of relationships did not change when examining future self-similarity and connectedness measures separately.

connectedness were tested in three separate models: (1) egocentric bias (RT); (2) egocentric bias error-rate; (3) self-reported perspective-taking and empathic concern. For the egocentric bias models, egocentric bias scores, psychological connectedness, their two-way interaction, and altercentric bias, were simultaneously entered as predictors of AUC. For the self-reported perspective-taking model, perspective-taking and empathic concern, along with their two-way interactions with psychological connectedness and the main effect of psychological connectedness, were simultaneously entered as predictors of AUC. Coefficients and overall model statistics are displayed in Table 5.3. Contrary to the hypothesis, none of the psychological connectedness-by-perspective-taking interactions were significant.

Table 5.3

Multiple linear regressions on temporal discounting AUC, with psychological connectedness and perspective-taking measures as predictors

Variables	***β***	***b***	***SE***	***p***
Model 1				
PC Scale	.07	0.008	0.009	.35
Alter Bias (RT)	-.11	-0.0003	0.0002	.14
Ego Bias (RT)	.03	0.0001	0.0002	.64
PC Scale x Ego Bias (RT)	.06	0.0001	0.0001	.43
Model 2				
PC Scale	.06	0.007	0.009	.44
Alter Bias (ER)	-.02	-0.002	0.008	.81
Ego Bias (ER)	-.14	-0.014	0.008	.07
PC Scale x Ego Bias (ER)	-.07	-0.004	0.004	.33
Model 3				
PC Scale	.07	0.009	0.009	.35
IRI-PT	.07	0.021	0.025	.40
IRI-EC	-.12	-0.036	0.026	.16
PC Scale x IRI-PT	.03	0.004	0.013	.73
PC Scale x IRI-EC	-.03	-0.005	0.015	.72

Note. IRI = Interpersonal reactivity index; PC = psychological connectedness; PT = perspective-taking; EC = empathic concern; RT = response time (in milliseconds); ER = error-rate.

All variables were mean-centred.

Model 1, $F(4, 195) = 1.05$, $p = .38$, $R^2_{adj} = .001$; Model 2, $F(4, 195) = 1.41$, $p = .23$ $R^2_{adj} = .01$; Model 3, $F(5, 194) = 0.58$, $p = .72$, $R^2_{adj} = -.01$.

5.3.4. Exploratory Analysis: Moderation by Subjective SES

5.3.4.1. Perspective-Taking

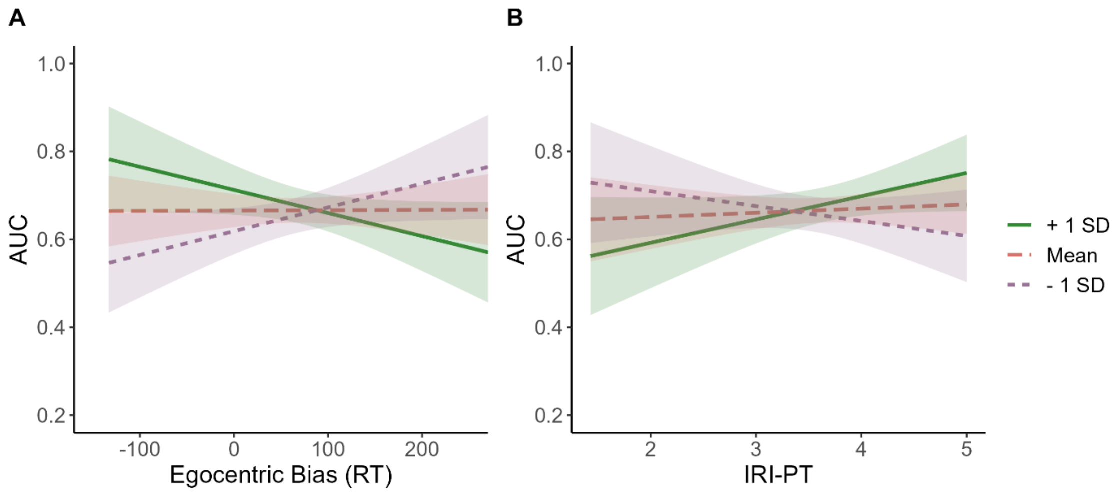
Bulley and Schacter (2020) argue that focusing on the future may not always increase preference for delayed rewards, and may even *decrease* patience in some circumstances; for example, if one's environment is perceived as unstable or difficult to control, as may be the case among people lower on the socioeconomic ladder (Pepper & Nettle, 2017). If perspective-taking abilities facilitate a greater focus on one's future perspective during intertemporal decision-making, the relationship with temporal discounting may depend upon the socioeconomic context of the decision-maker.

Multiple linear regression analysis was therefore conducted on temporal discounting AUC to determine whether subjective SES (M = 5.4, SD = 1.6) moderated associations between perspective-taking measures and temporal discounting. Separate regression models were computed to test RT and error-rate measures of egocentric bias. For each model, egocentric bias (either RT or error-rate), IRI perspective-taking, IRI empathic concern, and their two-way interactions with subjective SES were simultaneously entered alongside the corresponding main effect coefficients.

In the RT model, there was a significant interaction between egocentric bias and subjective SES, and a marginally significant interaction between self-reported perspective-taking and subjective SES (p = .051) (see Table 5.4). Lower egocentric bias (reflecting better perspective-taking performance) and higher self-reported perspective-taking were increasingly associated with a greater preference for future rewards at higher levels of subjective SES (Fig. 5.3).

Figure 5.3

Egocentric bias and self-reported perspective-taking associations with temporal discounting at lower, mean, and higher subjective SES



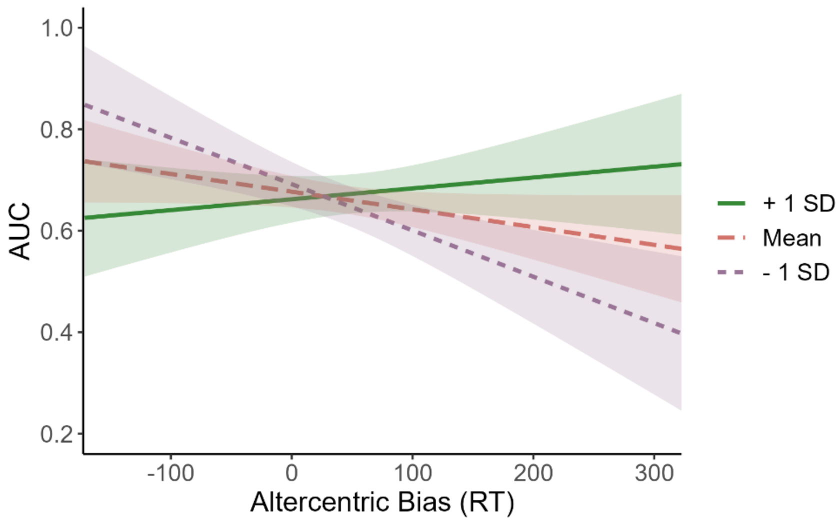
***Note*.** **(A)** Subjective SES x egocentric bias (RT). Simple slopes: -1 *SD* (b = 0.001, *SE* = 0.0003, p = .05); mean (b = 0.0000, *SE* = 0.0002, p = .97); +1 *SD* (b = -0.001, *SE* = 0.0003, p = .06). RT = response time (in milliseconds). **(B)** Subjective SES x self-reported perspective-taking. Simple slopes: -1 *SD* (b = -0.03, *SE* = 0.03, p = .30); mean (b = 0.01, *SE* = 0.02, p = .66); +1 *SD* (b = 0.05, *SE* = 0.03, p = .07). IRI-PT = interpersonal reactivity index: perspective-taking.

AUC = area under the curve. Bands reflect 95% confidence intervals.

The interaction between altercentric bias RT and subjective SES was also subsequently added to the model (Table 5.4). The purpose of this was to examine whether a broader ability to resolve conflict between inconsistent perspectives (perhaps facilitated by domain-general cognitive processes; Qureshi et al., 2010) might underlie the (moderated) relationship between egocentric bias and temporal discounting, rather than a specific capacity to overcome interference from one's current self-perspective. Contrary to this possibility, results indicated that while altercentric bias also significantly interacted with subjective SES, this was in the opposite direction to egocentric bias, with higher altercentric bias associated with a *decreased* preference for delayed rewards among lower-SES participants (Fig. 5.4). Possible reasons for these contrasting moderating effects are discussed in Section 5.4.1.

Figure 5.4

Relationship between altercentric bias and temporal discounting at lower, mean, and higher subjective SES



Note. Simple slopes: -1 *SD* (*b* = -0.001, *SE* = 0.0003, *p* = .001); mean *(b* = -0.0003, *SE* = 0.0002, *p* = .06); +1 *SD* (*b* = 0.0002, *SE* = 0.0002, *p* = .39). RT = response time (in milliseconds). AUC = area under the curve. Bands reflect 95% confidence intervals.

Table 5.4

Regression coefficients for perspective-taking measures and subjective socioeconomic SES on temporal discounting AUC

	Model 1				Model 2			
Variables	***β***	***b***	***SE***	***p***	***β***	***b***	***SE***	***p***
Subjective SES	.05	0.01	0.01	.47	.04	0.005	0.01	.58
IRI-PT	.03	0.01	0.02	.66	.03	0.01	0.02	.63
Egocentric bias RT	.003	0.00001	0.0002	.97	.03	0.0001	0.0002	.67
IRI-PT x Subjective SES	.14	0.03	0.01	.05	.12	0.02	0.01	.08
Egocentric bias RT x Subjective SES	-.19	-0.0003	0.0001	.01	-.21	-0.0004	0.0001	.003
Altercentric bias RT					-.13	-0.0003	0.0002	.06
Altercentric bias RT x Subjective SES					.22	0.0004	0.0001	.002

Note. IRI-PT = interpersonal reactivity index: perspective-taking; SES = socioeconomic status; SE = standard error of unstandardised coefficient; RT = response time (in milliseconds).

All variables were mean-centred.

Model 1, $F(5, 194) = 2.62$, $p = .03$, $R^2_{adj} = .04$; Model 2, $F(7, 192) = 3.84$, $p = .001$, $R^2_{adj} = .09$.

In the regression model based on error-rate, the interaction between subjective SES and egocentric bias was not significant, though in this model there was a significant interaction between subjective SES and self-reported perspective-taking ($\beta = .18$, $p = .01$) (see Appendix I, Table 26 for full model coefficients).

5.3.4.2. Psychological Connectedness

Given the surprising absence of an association between psychological connectedness and temporal discounting, I also examined whether this relationship was moderated by subjective SES. A multiple linear regression analysis was performed with psychological connectedness, subjective SES, and their two-way interaction simultaneously as predictors of temporal discounting AUC. Results showed a significant interaction between subjective SES and psychological connectedness, $b = 0.01$, $SE = 0.005$, $p = .031$, with follow-up simple slopes analysis indicating that higher psychological connectedness was associated with increased AUC (i.e., lower temporal discounting) for high-SES participants (+1 *SD*, $b = 0.03$, $SE = 0.01$, $p = .032$), but not mean ($b = 0.004$, $SE = 0.01$, $p = .68$) or low-SES participants (-1 *SD*, $b = -0.01$, $SE = 0.01$, $p = .50$). However, these exploratory findings should be treated with caution – particularly as the overall regression model was not significant, $F(3, 196) = 1.97$, $p = .12$, $R^2_{adj} = .03$.

5.4. Discussion

Contrary to recent theorising based on neuroimaging data (Soutschek et al., 2016; O'Connell et al., 2018), the present study did not find an overall association between perspective-taking abilities and intertemporal decision-making in a monetary choice task. Furthermore, my hypothesis that individual differences in perspective-taking abilities would be more strongly associated with future-oriented decision-making among participants who felt lower similarity/connectedness to their future self was not confirmed. Interestingly, contrary to previous research reviewed in Section 1.2.3 (e.g., Ersner-Hershfield et al., 2009a), there was also no significant overall correlation between psychological connectedness and temporal discounting.

However, exploratory analyses indicated more nuanced relationships, with higher perspective-taking abilities and psychological connectedness increasingly associated with future-oriented decisions among participants who perceived themselves as higher on the socioeconomic ladder. Most strikingly, a greater ability to shift focus away from the salient current self-perspective (i.e., lower egocentric bias) in visual perspective-taking predicted an increased preference for future rewards among high-SES participants, but a *decreased* preference for future rewards among low-SES participants. Although exploratory, these findings could have important implications as they suggest social-cognitive training interventions (e.g., Valk et al., 2017) may have the unintended consequence of decreasing patience in intertemporal decision-making among low-SES individuals.

5.4.1. Perspective-Taking and Subjective SES

While not hypothesised *a priori*, the moderating effect of subjective SES on perspective-taking abilities is compatible with the notion of “farsighted impulsivity”, which posits that thinking about the future may increase preference for immediate rewards in some contexts (Bulley & Schacter, 2020). Of relevance to the present findings, low-SES individuals are likely to occupy less stable environments (e.g., in terms of income and employment) and to experience lower perceived control over their future. This environmental instability and uncertainty about the future may increase preference for proximal rewards, rather than waiting for delayed rewards that may never materialise (Pepper & Nettle, 2017). It is possible that for some lower-SES individuals, a stronger ability to shift focus away from the current self-perspective may heighten salience of this future uncertainty, perhaps therefore further shifting preference towards immediate rewards (Bulley & Schacter, 2020).

Interestingly, the opposing relationship was found for altercentric bias, with higher altercentric bias associated with increased temporal discounting among lower-SES participants. Given that altercentric bias is often interpreted as evidence for spontaneous perspective-taking (Samson et al., 2010), one possible explanation for this finding is that high-altercentric individuals may have a greater propensity to shift their focus away from the here-and-now to imagine their future perspective during intertemporal decision-making. Similar to low-egocentric individuals, high-altercentric individuals may therefore display increased temporal discounting when the future is perceived as more uncertain, as may be the case among people from a low-SES background. Another possibility is that individuals with greater social-cognitive tendencies, perhaps reflected by an ability to shift focus from the current self-perspective (low egocentric bias) and a propensity to spontaneously consider the perspective of others (high altercentric bias), are more attuned to their position in social hierarchies. For low-subjective SES individuals, this may result in a pattern of decision-making that prioritises accumulation of resources in the present in order to improve relative social standing.

5.4.1.1. RT and Error-Rate Measures

It is worth emphasising that only RT measures of visual perspective-taking interacted with subjective SES, not error-rate. Although speculative, one possible explanation for this is that error-rate measures in this task may have been especially sensitive to attentional lapses, and therefore reflected a less pure measure of egocentric and altercentric biases than RT measures. This is because if participants missed a perspective cue, their probability of responding correctly on that trial was reduced to chance for inconsistent, but not consistent trials. This may be particularly problematic because error-rates were low, meaning a single attentional lapse could meaningfully contribute to an individual's overall score. Although lapses in attention would also increase RTs, they may do so more evenly across conditions (therefore contributing less substantially to inconsistency effects), and increased RT on any given trial would be averaged across all other correctly answered trials for that condition.

5.4.2. Psychological Connectedness and Intertemporal Choice

Given previous evidence for an association between psychological connectedness and temporal discounting (e.g., Ersner-Hershfield et al., 2009a), it is surprising that the present study failed to find a significant correlation. One possible reason for this is that the strength of the relationship may depend on task order. In the present study, participants completed psychological connectedness measures after the intertemporal choice task, whereas previous studies have sometimes administered psychological connectedness measures first (Ersner-Hershfield et al., 2009a, Study 2; Bartels & Rips, 2010; McCue et al., 2019), or not specified task order (Ersner-Hershfield et al., 2009a, Study 1; Sokol & Serper, 2020). It is possible that asking participants to report psychological connectedness prior to an intertemporal choice task makes perceived similarity or dissimilarity to one's future self more salient during decision-making, therefore exerting a stronger influence on relative prioritisation of present and future outcomes. However, Bartels and Urminsky (2011, Study 5) found a significant correlation between self-reported psychological connectedness and temporal discounting when the latter was measured alone three weeks later, and other studies have found significant associations when psychological connectedness and temporal discounting task order was counterbalanced (Joshi & Fast, 2013; Pietroni & Hughes, 2016).

Based on the moderating effect of subjective SES on psychological connectedness in the present study, another possibility is that previous research has overestimated the relationship between psychological connectedness and temporal discounting in monetary reward tasks due to the predominant – though not exclusive (e.g., Bartels & Urminsky, 2011, Study 5; Sokol & Serper, 2020) - use of undergraduate student samples, who perhaps have a generally higher subjective SES compared to online samples. For example, Ersner-Hershfield et al. (2009, Studies 1-2) used Stanford undergraduate students in their research. It seems plausible that many participants from this elite US university would have had a generally high perception of their social status. Although the present findings were exploratory, it makes some intuitive sense that perceived similarity or connectedness to a future self may only facilitate future-oriented behaviour when individuals feel they can actually afford to wait for delayed rewards. Future research into the relationship between psychological connectedness and temporal discounting of monetary rewards may benefit from use of more diverse samples and examination of SES measures to investigate these preliminary findings further.

It should also be noted that the timeframe for the psychological connectedness measures (10 years) did not match the timeframe for the temporal discounting delays (1 week – 5 years), which may have attenuated the association between measures. Still, this is consistent with Ersner-Hershfield et al.'s (2009a, Studies 1-2) approach, where perceived similarity to a future self in ten years predicted future-oriented decisions in a monetary choice task employing delays of just 10-75 days (also see Joshi & Fast, 2013; Pietroni & Hughes, 2016; Sokol & Serper, 2020). There was also no evidence in the present study that the relationship between psychological connectedness and temporal discounting was stronger at longer delay lengths (e.g., 5 years vs. 1 month; see Appendix I, Table 24).

5.4.3. Limitations

There are several limitations of the present study. Firstly, as executive function measures were not included, it may be argued that associations between visual perspective-taking measures and temporal discounting relate to common involvement of domain-general mechanisms such as inhibitory control, rather than specific social-cognitive capacities. However, executive function appears to be relevant to both egocentric and altercentric bias (Qureshi et al., 2010), so a domain-general explanation would not account for the observation that subjective SES had opposing moderating effects on these two measures.

Secondly, internal reliability of visual perspective-taking measures was poor, which may have attenuated correlations between measures. Low reliability can also increase the probability that observed associations are spurious (Parsons et al., 2019), though it is worth noting that for the interaction with subjective SES, a fairly consistent pattern of results was observed across behavioural and self-report measures.

Thirdly, hypothetical rewards were used in the intertemporal choice task. While previous studies have found that people generally make similar decisions for real and hypothetical rewards (Odum, 2011), this may not hold across all groups. In particular, it has been suggested that people who perceive themselves to be lower in a social hierarchy may be especially sensitive to the distinction between real and hypothetical outcomes (Sheehy-Skeffington, 2020). For low-SES individuals, perspective-taking abilities may facilitate overcoming the initial hypothetical distance to "immediate" rewards, therefore increasing their perceived value.

5.5. Conclusion

The hypothesis that better perspective-taking abilities would predict more future-oriented decision-making – especially among individuals who felt dissimilar to their future self - was not supported. However, exploratory analysis pointed to more nuanced relationships, whereby higher perspective-taking abilities and psychological connectedness were increasingly associated with a greater preference for future rewards among participants who perceived themselves to be higher on the socioeconomic ladder. Future research may aim to confirm these exploratory findings and examine whether social-cognitive training in perspective-taking influences intertemporal decision-making.

Chapter 6 – General Discussion

6.1. Summary of Main Empirical Findings

Research in Chapter 2, examining mental representations of future self-relevant events, provided novel evidence that lower psychological connectedness to a future self was associated with an increased focus on self-identity during future thinking; reflected by greater use of third-person (vs. first-person) mental imagery, and a tendency to analyse what future behaviours would express about the self. However, contrary to predictions, lower psychological connectedness was not associated with an increased focus on broader meaning vs. concrete details of future events, and experimentally manipulating psychological connectedness did not impact key dependent variables – a point which I return to later in this discussion (Section 6.2.3).

Building on findings from Chapter 2, in Chapter 3 I hypothesised and found that lower perceived similarity to a future self was associated with higher perceived importance of future decision attributes which expressed something desirable about self-identity (e.g., generosity, high social status, open-mindedness), as opposed to attributes relating to more concrete or hedonic benefits (e.g., comfort, convenience). A composite psychological connectedness measure comprised of future self-similarity and connectedness items surprisingly did not have high internal consistency for some studies in Chapter 3, and correlations with attribute importance ratings were more robust for future self-similarity than future self-connectedness.

In Chapter 4, I used a variation of a future self letter-writing task to explore how people conceptualised their future selves during a major life transition often associated with significant personal change, and how this may vary according to individual differences in perceived future self-similarity or connectedness. Incoming first-year students wrote a postcard to their graduating future self and completed measures of future self-similarity, connectedness, and vividness. Content analysis of postcard contents indicated that while students often hoped for change and self-growth during their time at university, they also appeared to seek to establish continuity; either explicitly expressing a desire for important identity-relevant characteristics to remain stable into the future, or drawing narrative connections between different life stages. Analysis of pronoun use also pointed to potential distinctions in how students' conceptualised *connectedness* and *similarity* with their future self. While previous research has often considered these items as capturing the same construct, results in Chapter 4 found contrasting associations for the two measures, with higher connectedness – but *lower* similarity – correlated with an increased tendency to refer to present and future selves as a collective (e.g., "we", "us"), and a decreased tendency to use first-person singular (e.g., "I") pronouns. Students also frequently expressed self-praise and kindness towards their future self, which was noteworthy given that people can often be relatively critical of themselves compared to others (Neff, 2003). This self-kindness may have been facilitated by the self-distancing nature of the task, with writing to the self as though it was a different person potentially triggering prosocial processes. Indeed, expressions of self-kindness and compassion were positively correlated with use of second-person (e.g., "you") and negatively correlated with use of first-person singular pronouns (e.g., "I"), with this pattern of pronoun use consistent with a more self-distanced, less self-immersed perspective (Kross et al., 2014).

Contrary to expectations, in Chapter 5, I found no evidence that individual differences in perspective-taking abilities more strongly contributed to future-oriented decisions when present and future selves were perceived as dissimilar. I also did not find main effects of perspective-taking measures or psychological connectedness on future-oriented decisions in an intertemporal choice task (*c.f.* Ersner-Hershfield et al., 2009a). However, higher perspective-taking abilities (using both self-report and cognitive-behavioural measures) and psychological connectedness were selectively associated with a stronger tendency to make future-oriented decisions among individuals reporting a higher subjective socioeconomic status.

6.2. Discussion of Main Theoretical Contributions

Results from this thesis extend previous work on psychological connectedness, psychological distance, future thinking, and the self-concept in a number of ways. Firstly, associations between lower psychological connectedness and increased use of third-person (vs. first-person) mental imagery, and a tendency to think of future behaviours in terms of underlying traits and dispositions (Chapter 2), point to parallels between thinking about dissimilar future selves and others. These novel findings in relation to psychological connectedness align with effects of temporal distance on cognitive self-representations (Pronin & Ross, 2006; Wakslak et al., 2008). Since psychological connectedness is correlated with temporal distance (e.g., Rutt & Löckenhoff, 2016), effects of these two constructs on mental representations of future self-relevant events may often be confounded. In the present research, psychological connectedness associations remained significant after controlling for temporal distance. On the other hand, previous studies investigating effects of temporal distance (Pronin & Ross, 2006; Wakslak et al., 2008) have not controlled for psychological connectedness. It therefore seems possible that decreased psychological connectedness may partly account for previously observed effects of temporal distance on self-representations (see D'Argembeau & Van der Linden, 2004, for a related argument). Future research investigating effects of temporal distance on self-representations may therefore benefit from also measuring psychological connectedness to disentangle their effects.

Still, effects of temporal distance on visual perspective in mental imagery and perceived identity-expressiveness of future behaviours are well-grounded in construal level theory (Wakslak et al., 2008; Libby et al., 2009). Since perceived dissimilarity to a future self could itself be conceptualised as a form of psychological distance, temporal distance and psychological connectedness associations with future self-representations could potentially both be underpinned by distance-dependent changes in construal level. However, while avoiding putting too much emphasis on null effects, it is interesting to note that lower psychological connectedness was not associated with increased focus on broader meaning (vs. concrete details) of future events, which departs from predictions of CLT.

Beyond the framework of CLT, other mechanisms could potentially account for associations between psychological connectedness and focus on self-identity during future thinking. For instance, people may be motivated to explore and evaluate possible future selves during periods of anticipated self-change, allowing them to orient present behaviour towards the realisation of desired identities and avoidance of undesired identities (Markus & Nurius, 1986; Hallford & D'Argembeau, 2022). Additionally, reflecting on high-level traits and characteristics of a dissimilar future self and comparing these with the present self may foster development of autobiographical links and narratives that can provide a subjective sense of continuity during periods of self-change (Habermas & Bluck, 2000; Libby & Eiabch, 2011a)

A second important contribution of the present work was the finding that lower future self-similarity was associated with increased prioritisation of identity-relevant attributes of future decision outcomes (Chapter 3). In addition to potential practical implications (see Section 6.3), these findings advance our theoretical understanding of psychological connectedness by demonstrating how perceived future self-similarity relates to individual decision-making processes beyond intertemporal trade-offs and related behavioural outcomes, which had been the primary focus of previous research on this topic (Urminsky & Bartels, 2019). I hope that these findings will therefore be generative of new research directions investigating how people prioritise and evaluate different goals and future outcomes when anticipating intervening personal change (e.g., around major life transitions).

Thirdly, there was some evidence in Chapter 4 and Chapter 5 that social-cognitive processes are engaged when thinking about and making decisions for future selves. In particular, consistent with neuroimaging research implicating perspective-taking processes in future-oriented decision-making (e.g., Soutschek et al., 2016), research in Chapter 5 found that higher perspective-taking abilities (assessed using self-report and cognitive-behavioural measures) were associated with an increased preference for future rewards in an intertemporal choice task – though unexpectedly this was only the case for individuals with a high sense of social status. Furthermore, the frequency with which participants expressed self-praise and kindness in a future self letter-writing task, particularly among those who spontaneously used second-person pronouns to refer to their future self (e.g., “you”), may indicate that a cognitively distanced perspective of the self triggers prosocial tendencies. However, it is important to note that - contrary to my expectations outlined in Section 1.5.2 – there was no indication that these relationships between social-cognitive processes and future thinking and decision-making were moderated by psychological connectedness.

Finally, while not an initial aim of the thesis, results pointed to a potentially important distinction between future self-connectedness, as measured using the overlapping circles scale (Ersner-Hershfield et al., 2009a; Bartels & Urminsky, 2011), and future self-similarity measures. In Chapter 3, correlations with perceived importance of identity-attribute importance ratings were less consistent for future self-connectedness than similarity, while in Chapter 4 – more strikingly – connectedness and similarity measures had contrasting associations with pronoun use in a future self letter-writing task. The tendency for participants reporting high connectedness but low similarity to refer to present and future selves collectively as "we" suggests they may view these selves as distinct but closely interconnected aspects of the self-concept.

6.3. Methodological Considerations for Future Research

6.3.1. Measurement: Connectedness & Similarity

While most previous studies have not conceptually distinguished between future self-connectedness and similarity measures (Ersner-Hershfield et al., 2009a; Bartels & Urminsky, 2011), two recent studies found that the two measures had contrasting relationships with self-improvement behavioural intentions (Zhao et al., 2022; Ganschow et al., 2024). Given these past results and findings in the present thesis, researchers should examine future self-connectedness and similarity items separately before combining to verify that the two items show a similar pattern of associations with study variables of interest. Further evidence of contrasting associations with other measures could be critical to developing a clearer theoretical understanding of the different ways people can conceptualise the link between present and future selves.

There was some indication that future self-connectedness and similarity items were less strongly associated for judgements concerning the future self after a life transition (Chapter 3 – Study 1 [$\alpha = .67$], Study 2 [$\alpha = .70$], Study 3B [$\alpha = .64$]; Chapter 4 [$\alpha = .62$]), compared to studies that did not involve an intervening transition (Chapter 2 – Study 1 [$\alpha = .79$]; Study 3A [$\alpha = .78$]). However, not all studies followed this pattern, with high internal consistency observed for similarity and connectedness judgements to a post-graduation future self in Chapter 2, Study 2 ($\alpha = .77$). Still, it seems intuitively plausible that perceived future self-similarity and connectedness may become less aligned in the presence of intervening life transitions. In particular, some individuals may envisage being a quite different person after a major life transition, while conceiving of this future self as highly relevant or interconnected with present identity. It would be interesting for future research to examine how the relationship between perceived connectedness and similarity judgements may differ across contexts.

Furthermore, since previous studies have typically measured both connectedness and similarity using the overlapping circles scale, internal reliability of items and consistency of their associations with other measures might be inflated by common method variance. Research in the present thesis overcame this issue by measuring future self-connectedness on the overlapping circles scale and future self-similarity on a 0-100 numerical rating scale (see Bartels & Urminsky, 2011, Study 5). However, further advancement in our understanding of perceived similarity and connection between present and future self-representations may also require more work to be undertaken on measure development and validation. A useful first step in this respect may be to use qualitative approaches to examine how people consciously interpret similarity and connectedness measures. For example, as part of their validation of the inclusion of other in the self scale, Aron et al. (1992) asked participants to describe in their own words what the overlapping circles diagram meant to them, and then performed a content analysis on their responses. By far the most frequent interpretation related to expressions of interdependence and integration between self and other (Aron et al., 1992). Conducting similar research for future self-connectedness and similarity items may help to shed light on how participants differently interpret these measures.

6.3.2. Manipulating Psychological Connectedness

This thesis raises potential considerations for future research seeking to manipulate psychological connectedness. Studies in Chapter 2 ,which used Bartels and Urminsky's (2011) trait-stability manipulation, found significant effects on self-reported psychological connectedness (*d*'s = 0.26 - 0.28), but these were much smaller than observed in previous research (*d's* = 0.51 – 0.80) (Bartels & Urminsky, 2011 [Study 2 pretests]; Sheldon & Fishbach, 2015 [Study 2]; Bartels & Urminsky, 2015 [Study 3]. One potential reason for this is that in the present research, psychological connectedness was measured at the end of studies, after the dependent variables, in contrast to some previous studies which have measured psychological connectedness immediately after the experimental manipulation (Bartels & Urminsky, 2011; Bartels & Urminsky, 2015). It is possible either that the impact of the manipulation on psychological connectedness diminishes fairly quickly, or that effect sizes in previous studies were inflated by demand characteristics due to measuring psychological connectedness immediately after the experimental manipulation (and these two possibilities are not mutually exclusive). In any case, effect sizes reported in this thesis, based on pre-registered studies utilising larger sample sizes than in many previous related studies, provide valuable information for researchers in determining sample sizes required to obtain desired statistical power in future studies.

As researchers continue to move beyond intertemporal decisions tasks in examining effects of psychological connectedness, existing manipulations may need to be adapted or new manipulations devised to avoid unintentional priming of processes or concepts relating to the dependent variables. In particular, most psychological connectedness manipulations involve thinking and/or writing about changes or stability in identity-relevant characteristics, meaning self-identity is made salient to participants in both conditions. This may attenuate between-groups differences when outcome measures relate to a focus or interest in identity implications of future events – as was the case for several dependent variables in the present thesis. One option for dealing with this issue might be to include a filler task between the psychological connectedness manipulation and administration of the dependent measures, though the effect of the manipulation on psychological connectedness may also diminish during this intervening period. Alternatively, Peetz and Wilson's (2013) temporal landmark salience manipulation could be used, which has the benefit of not requiring participants to reflect on self-identity as part of the task. However, since it is not a direct manipulation of future self-similarity, but instead of temporal landmark salience, any effects on dependent variables would need to be mediated by future self-similarity to provide strong evidence that future self-similarity was a causally important mechanism.

6.4. Practical Implications

The effect sizes observed in this thesis were generally fairly modest, which may lead some to question whether they are of any practical importance. I believe that they could be, for two reasons. Firstly, even small effects can have meaningful impacts when applied to large populations. For example, if an advert is seen by a million people, a message frame that slightly increases its effectiveness can drive a large number of additional customers. Secondly, psychological connectedness is an emerging construct, and there is much to be learned about how it can most effectively be measured, and factors that may moderate the strength of relationships with other constructs. Further research may – for example – demonstrate particular contexts or populations where psychological connectedness is a stronger predictor of future thinking and decision-making processes and outcomes. In the remainder of this section, I outline some potential practical implications of the findings in this thesis.

6.4.1. Individual Decision-Making

Research reported in Chapters 2 and 3 suggests that individuals may particularly focus on identity implications of future decision outcomes when anticipating intervening self-change. This may have implications for how organisations, such as employers, travel agencies, and brands, can best communicate their value to potential customers or job applicants. In particular, it may be beneficial to highlight identity-based benefits of future decision outcomes when individuals are likely to perceive greater dissimilarity between the present self making the decision in the moment and the future self that will experience the outcome. This may be the case when decisions and outcomes are separated by a life transition, like graduating from university. For instance, an undergraduate deciding on a post-graduation job may be more swayed by the idea of working somewhere prestigious, or of contributing positively to society, rather than having a short commute to work and flexible hours. Even less significant intervening temporal landmarks, when made salient (Peetz & Wilson, 2013), may have similar effects.

Beyond how organisations can appeal to decision-makers, an important consideration is how decision-makers can be supported in making decisions that they will be satisfied with. The present findings may have important implications in this respect. In particular, individuals who feel dissimilar to their future self, and potentially therefore base decisions on identity-relevant attributes, may more often choose to do things that they end up not enjoying. For instance, someone who decides to book an ecotourism holiday because it conveyed a desirable future self-image may regret their decision when actually experiencing a lack of comfort and convenience during the trip. Conversely, it might also be the case that individuals who feel highly similar to their future self fail to adequately consider identity-based implications of future outcomes, perhaps therefore neglecting to make decisions which further contribute to a sense of meaning or purpose in life.

It would be interesting for future research using longitudinal approaches to examine how perceived similarity to a future self and prioritisation of identity-based vs. concrete attributes predicts future outcome satisfaction. If, for example, individuals who feel dissimilar to their future self and therefore prioritise identity-based considerations tend to ultimately end up less satisfied with their decision, it may be beneficial to encourage greater initial consideration of concrete attributes during decision-making for these individuals. For instance, a careers adviser dealing with an undergraduate who is highly embedded within student life, and perhaps therefore likely to see graduation as involving major self-change, should perhaps be particularly sensitive to ensuring that this student has considered the day-to-day realities of their planned career choice.

Findings from Chapter 5 also have potential implications for supporting individual decision-making. Evidence that better perspective-taking performance was associated with more future-oriented decisions for participants reporting a higher perceived socioeconomic status suggests that social-cognitive training that improves perspective-taking abilities could have beneficial impacts among such individuals. However, there was evidence of a contrasting association among participants reporting a lower perceived socioeconomic status, with better perspective-taking performance on a cognitive-behavioural task predicting increased preference for immediate rewards. This may reflect that, for lower socioeconomic status individuals, shifting focus away from the here-and-now may make perceived uncertainty about the future more salient, further shifting preference towards immediate rewards (Pepper & Nettle, 2017; Bulley & Schacter, 2020). These findings hint at the concerning possibility that social-cognitive training that improves perspective-taking abilities (e.g., Valk et al., 2017) may diminish future-orientation among individuals with lower perceived socioeconomic status, which is an important topic for future investigation.

6.4.2. Mental Well-Being During Periods of Self-Change

Results reported in Chapter 4 suggest that the future self letter-writing could potentially be a useful intervention for supporting individuals' well-being during major life transitions – particularly undergraduate students starting at university. The transition to university is generally recognised as a stressful time in the lives of young adults, and associated with a reduction in subjective well-being (Iyer et al., 2009). Reductions in well-being may be caused by disruptions to self-continuity

(Iyer et al., 2009), as well as the demands of forging new social networks and meeting academic demands (Dyson & Renk, 2006). The postcard-writing study reported in Chapter 4 may support mental well-being in at least two ways. Firstly, many students engaged in forms of autobiographical reasoning (Habermas & Bluck, 2000); writing about how past experiences have shaped their plans and expectations for the future, and metaphorically referring to their progress through life as a journey (Landau et al., 2014). These self-reflections linking together one's past, present, and future into a coherent narrative may help to bolster self-continuity (Habermas & Köber, 2015), potentially increasing subjective well-being (Sedikides et al., 2023). A second way the postcard task may positively impact well-being is by promoting self-distancing (Kross & Ayduk, 2017). A self-distanced perspective of the self may be prompted in this task both by thinking about the self several years into the future, and the nature of writing a postcard or letter, which encourages use of second-person pronouns (e.g., "you"). Perhaps facilitated by this self-distanced perspective, students frequently expressed self-praise and kindness in their postcards. Previous research has shown that greater self-kindness is associated with a reduction in adverse mental states, such as anxiety and stress – perhaps mediated by enhanced emotional regulation (see Neff, 2023, for a review). Of course, evidence in Chapter 4 does not demonstrate that a future self postcard-writing task positively impacts mental well-being (or self-continuity for that matter), only that there are plausible mechanisms through which it could. Further research would be required to confirm these ideas, perhaps using pre-post measures of mental well-being.

6.5. Limitations

There are several overarching limitations of the research presented in this thesis. Firstly, key findings summarised in Section 6.1 were correlational, and therefore do not allow causal claims about the effects of psychological connectedness. An important topic for further research seeking to extend the present findings is to establish causal evidence for effects, which may require the use of different psychological connectedness manipulations – as discussed in Section 6.2.3.

A second limitation concerns the generalisability of the findings. Aside from research reported in Chapter 5, all studies used samples of young adult participants. I believe that this methodological decision was justified based on the rationale that perceived similarity or connectedness to future selves may be more malleable (and therefore easier to experimentally manipulate) during young adulthood, while psychological connectedness may be uniformly high among middle-aged or older adults over the relatively short temporal intervals used for most studies in this thesis. Still, it is important to recognise that this methodological choice means that the findings may not be generalisable to other age groups. It is important to distinguish here between the potential generalisability of associations between underlying constructs and mechanisms suggested by the present findings, and generalisability of the empirical observations themselves. In terms of empirical observations, a lack of generalisability to middle-aged or older adults seems likely, if my concern is well-founded that psychological connectedness to relatively near-future selves among individuals in these age-ranges is generally high. Generalisability of associations between underlying constructs is less clear. For example, it may be the case that when middle-aged or older adults do experience lower psychological connectedness, they are more likely to use third-person mental imagery when imagining future events, but due to greater identity-stability in these age groups (Löckenhoff & Rutt, 2017), this experience of low psychological connectedness is relatively infrequent. However, there may be contexts in which even middle-aged or older adults feel a sense of dissimilarity between present and future selves, like when anticipating or experiencing major life transitions (e.g., retirement, divorce). An interesting avenue for future research may be to examine whether in such contexts, psychological connectedness relationships found in the present research can also be observed in these older age groups.

A third limitation is the limited range of temporal intervals used for studies in this thesis, with relationships mainly examined in the context of future events and decision outcomes that would occur within the next couple of years. Some research in the area of psychological connectedness has focused on much longer temporal distances, such as 20-year-old undergraduate students thinking about their 70-year-old future self (Hershfield et al., 2011). I believe that the relatively shorter temporal intervals used in the present research are justifiable, given that many of the hypothesised effects of low psychological connectedness (e.g., focus on broader meaning vs. concrete details, third-person mental imagery) also appear to occur when thinking about more temporally distant outcomes. I therefore expected that it may be easier to detect effects of psychological connectedness across more intermediate temporal distances, where events and outcomes were far enough away that people may anticipate some intervening self-change, but not so distant that mental representations would be highly abstract regardless of psychological connectedness, which seems likely to be the case when thinking decades into the future.

6.6. Conclusions

The aims of this thesis were to examine how perceived similarity (i.e., psychological connectedness) to a future self shapes how people think about future self-relevant events and outcomes, and the potential impacts this may have on their judgement and decision-making. Moving beyond relationships with intertemporal trade-offs and related behavioural outcomes, which had been the focus of much of the previous research on psychological connectedness, the present thesis demonstrated associations between lower future self-similarity and increased focus on identity implications of future behaviours, and higher perceived importance of future decision attributes which express something desirable about the self.

These findings contribute to a greater understanding of how people think about events and outcomes that they expect to be experienced by a dissimilar future self, with potential implications for organisations seeking to shape and support individual decision-making. For example, findings may be relevant to education practitioners in providing effective careers advice to undergraduates about post-graduation jobs, or to employers and marketers aiming to highlight the appeal of jobs, products, or services to individuals during periods of anticipated self-change, such as life transitions.

Admittedly, effect sizes reported in this thesis were generally quite small. However, empirical investigation into psychological connectedness is still in its infancy. Little is therefore known about factors that may moderate relationships between psychological connectedness, future thinking and decision-making processes. This is true both in relation to the associations observed in the present research, and relationships between psychological connectedness and intertemporal decision-making demonstrated elsewhere in the literature (Hershfield & Bartels, 2018). Examination of potential moderators is an important topic for future research, as it may identity particular contexts or populations where application of psychological connectedness empirical research may be particularly fruitful.

Another important area for future research in this field is conceptually distinguishing between future self-similarity, connectedness, and self-continuity (Hong et al., 2024). While these terms and measures have often been used interchangeably, research in this thesis indicated that they sometimes have contrasting associations with theoretically relevant constructs. I therefore propose the following recommendations for researchers examining psychological connectedness in future studies. (1) Clearly define whether hypotheses and underlying theoretical frameworks relate to perceived similarity or continuity (where the latter refers to a meaningful connection between present and future selves despite self-change). In other words, for a given research question, should we expect people to respond differently to a particular measure if they feel dissimilar to their future self, or only if they lack *any* form of strong meaningful connection to this future self? (2) Consider including both connectedness and similarity items (ideally using different scales from one another to minimise common method-variance), and a separate self-continuity measure (Hong et al., 2024), so that any divergent associations between these measures and variables of interest can be identified. I believe that following these recommendations would contribute to greater clarity in the literature, and a stronger theoretical understanding of the different ways individuals can conceptualise the relationship between present and future self-concepts.

In sum, research in this thesis has advanced our understanding of how people think about and make decisions relating to future events and outcomes that will be experienced by a dissimilar future self. I hope that these findings will be generative of new research examining the emerging construct of psychological connectedness, ultimately fostering a stronger understanding of how temporal aspects of self-identity influence future thinking and decision-making.

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Appendix A – Pre-Registration, Data & Analysis Code

Chapter 2

Study 1

Pre-Registration:

https://osf.io/7uqpd?view_only=4730e373a65f442da933a9a046ccd4f0

Data & Code: https://osf.io/a2pj5/?view_only=b1e8fcff6a0d4268a227e132e9af3b80

Study 2

Pre-Registration:

https://osf.io/z38rg/?view_only=6a3b7d6af29041d2b62534f7266ca307

Data & Code: :

https://osf.io/xg42p/?view_only=c2fcacda5f5344de908aa544125310fa

Chapter 3

Data & Code:

https://osf.io/gptxr/?view_only=c07be4039e874d3c95b8e89943599d55

Pre-Registration

Study 1 was not pre-registered. Pre-registration links for the remaining three studies are as follows:

Study 2: https://osf.io/jstnq/?view_only=6cfa45beab1046f5b8b8168cb77c3c19

Study 3A: https://osf.io/y8sma/?view_only=dfda3e2ccf6f441ca4b5f5ea00ea0e04

Study 3B: https://osf.io/f5hxc/?view_only=f7c061adb6854c3aa53808563807df13

Chapter 5

Pre-Registration: https://osf.io/dyw5t

Appendix B – Chapter 2: Materials & Measures

Study 1

Psychological Connectedness Manipulation

High Connectedness: In this study, we would like you to think about your life over the next few years. Day-to-day life events change considerably throughout the course of young adulthood, but what changes the least is a person's core identity. The characteristics that make you the person you are right now are established early in life and fixed by the end of adolescence. Several studies conducted with young adults have found that the important characteristics that make up personal identity remain remarkably stable over time.

Please briefly summarise the above paragraph, and describe one or two important aspects of your own personal identity that will remain very stable over the next year.

Low Connectedness: In this study, we would like you to think about your life over the next few years. Day-to-day life events change considerably throughout the course of young adulthood, but what changes the most is a person's core identity. The characteristics that make you the person you are right now are not fixed, and are likely to change substantially. Several studies conducted with young adults have found large fluctuations in the important characteristics that make up personal identity, even over the course of a few months.

Please briefly summarise the above paragraph, and describe one or two important aspects of your own personal identity that might change over the next year.

Episodic Future Thinking Task

Continuing to think about your life over the next few years, we would next like you to imagine two specific events that you might personally experience in the future, between one and three years from now (i.e., occurring at least one year from now, and no more than three years from now). By "specific event", we mean something that will happen at a particular time and place, and last no longer than a single day. The events you think of do not need to be things that you have already planned, but should be things that could plausibly happen. The events can be about whatever you like (e.g., work, relationships, personal goals, holidays, etc.,) and may be either positive or negative.

For each event, you will be asked to provide a brief description and then answer some questions about it.

Click continue to begin the task.

<u>Event 1</u>

Please take a moment to imagine in detail a specific event you might personally experience **one to three years from now.**

Please think about the event in as much detail as possible, and keep the event in mind as you continue to the next page to answer some questions about it.

(next page)

Please briefly describe the future event you are imagining.

Event 2

Please take a moment to imagine in detail a specific event you might personally experience **one to three years from now.**

Please think about the event in as much detail as possible, and keep the event in mind as you continue to the next page to answer some questions about it.

(next page)

Please briefly describe the future event you are imagining.

Dependent Variables

Pre-Experiencing. All questions on a 7-point scale [Not at all – Very much]. First two questions relate to "pre-experiencing", the other two relate to mental time travel. Each item based on mean response to this item across the two future events. Combine all four into one index of autonoetic awareness.

- While imagining this event, I feel that I am experiencing it.
- While imagining this event, I feel that I am experiencing the situation as if I was there.
- While imagining this event, I feel that I travel forward to the time when it will happen.
- While imagining this event, I feel that I travel forward in time and that I am right at the moment when this event will happen.

Visual Perspective. 7-point scale (Entirely through own eyes – Entirely as an observer). Based on mean response to this item across the two future events.

Questions starts with short paragraph explaining visual perspective in future thinking).

- When imagining future events, most people picture the event in one of two ways. One way people picture the event is as an outside observer, looking at the scene from an external vantage point, where the person can see themselves in the event. Another way people picture the event is through their own eyes, from roughly the same viewpoint it would be experienced.
  For the event you are imagining, to what extent does it come to you as though you are an outside observer or as though you are seeing it through your own eyes?

Possible Mediating Variables

Focus on Broader Autobiographical Meaning. All on a 7-point Likert scale (Not at all – Very much). Each item based on mean response to this item across the two future events. Combine into one index of Focus on Broader Autobiographical Meaning.

While imagining this event:

- I think about the broader meaning of this event in my life.
- I think about how this event relates to important themes in my life.
- I think about what my behaviour in this event says about my personality.
- I think about whether I like the person I am in this event.

Online Self-Concept Consistency. All on a 5-point Likert scale (Strongly disagree – Strongly agree). Each item based on mean response to this item across the two future events. Combine into one index of Consistency with Current Self-Concept.

- I feel like the person in this event is a different person than who I am today.
- I feel like I am the same person in this event as I am today.
- My behaviour in this event is consistent with my current personality.

- I act differently in this event to how I would act if I experienced the same event today.

Perceived Insight into Future Internal Experience. All on a 5-point Likert scale (Strongly disagree – Strongly agree). Each item based on mean response to this item across the two future events. Combine into one index of Insight into Future Mental States.

- I know what I will be thinking during this event when it happens.
- It's difficult to know how I will feel during this event when it happens.
- I know what emotions I will be experiencing during this event when it happens.

Pre-Experiencing Mental States. 7-point scale (Not at all – Very much). Each item based on mean response to this item across the two future events. Combine into one index of Pre-Experiencing Mental States

- While imagining this event, I experience the thoughts I would have during the event.
- While imagining this event, I experience the emotions I would feel during the event.

Secondary/Control Variables

Each item based on mean response to this item across the two future events.

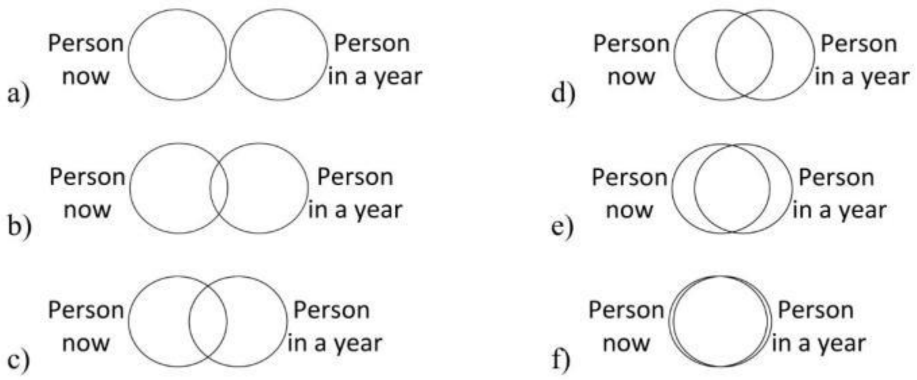
- While thinking of this event, the emotions I feel are: [7-point; Very negative – Very positive]
- While thinking of this event, the emotions I feel are: [7-point; Not at all intense – Very intense]

- The overall vividness of this event in my mind is: [7-point; Not at all vivid – Very vivid]
- This event involves an important theme or episode in my life: [7-point; Not at all important – Very important]
- I have experienced the same or a very similar event in the past: [7-point; Never – Very often]
- I have thought about this event often before: [[7-point; Never – Very often]
- How strongly do you believe this event will happen? [7-point; Not at all strongly – Very strongly]
- How strongly do you believe this event will happen exactly as you imagine it? [7-point; Not at all strongly – Very strongly]
- If this event occurs, when do you expect it to happen? [less than 6 months from now; 6-12 months from now, 1-2 years from now; 2-3 years from now; 3-5 years from now, over 5 years from now]

Self-Reported Psychological Connectedness

Responses across the two items will be z-transformed and then combined into a single scale of Perceived Psychological Connectedness.

- Please think about the important characteristics that make you the person you are now, and use the drop-down box below to select the diagram that best reflects the degree of connectedness you feel between the person you are now and the person you will be in a year, where no overlap means 'completely disconnected' and complete overlap means 'completely connected.'



- Thinking again about the important characteristics that make you the person you are now, please rate the degree of similarity you feel between the person you are now and the person you will be in a year, where 0 means 'I will be completely different' and 100 means 'I will be exactly the same'.

Psychological Characteristics of Future Self (Exploratory)

Similarity in Psychological Characteristics. All on a 7-point scale (Exactly the same – Completely different). Combine into one index of Similarity in Psychological Characteristics.

Compared to right now, how different do you expect the followings things about yourself to be one year from now?

- Personality
- Likes and dislikes
- Personal goals
- Values
- Beliefs

Uncertainty of Future Psychological Characteristics. All on a 5-point Likert scale (Strongly disagree – Strongly agree). Combine into one index of Uncertainty of Future Psychological Characteristics.

- I am uncertain as to what my personality will be like one year from now.
- I am uncertain as to what my likes and dislikes will be one year from now.
- I am uncertain as to what my personal goals will be one year from now.
- I am uncertain as to what my values will be one year from now.
- I am uncertain as to what my beliefs will be one year from now.

Study 2

Psychological Connectedness Manipulation

Low connectedness: "After graduating from university, young adults often experience significant changes in their day-to-day lives as they leave their student identities behind and take on new roles and responsibilities.

Because of these changes, the weeks and months following graduation are sometimes considered a transformative period in identity, with people often reporting feeling like a different person compared to when they were at university.

Thinking about the traits and characteristics that make you the person you are now, please write a few sentences about some of the important things about yourself that may change after you graduate from university. In other words, please describe some important differences between what you are like now and what you might be like in the future after graduating from university."

High connectedness: "After graduating from university, young adults often experience significant changes in their day-to-day lives as they leave their student identities behind and take on new roles and responsibilities.

Despite these changes, the weeks and months following graduation are sometimes considered a period of stability in identity, with people often reporting feeling like the same person compared to when they were at university.

Thinking about the traits and characteristics that make you the person you are now, please write a few sentences about some of the important things about yourself that may remain the same after you graduate from university. In other words, please describe some important similarities between what you are like now and what you might be like in the future after graduating from university."

Focus on Broader Meaning vs. Concrete Details

Please use the scale to indicate the extent to which you feel this activity is best described as either [Concrete description] or [Abstract description]. *(1 = Concrete description; 7 = Abstract description)*

- When thinking about this activity, to what extent do you focus on the specific details (i.e., practical steps or processes) involved in performing the activity, or on the broader meaning (i.e., wider significance or purpose) of the activity? (*1 = Entirely focus on specific details; 7 = Entirely focus on broader meaning)*

Affective Valence

To what extent do you think your experience of this activity would be:

- Positive

- Desirable
- Unpleasant (reverse-scored)
- Enjoyable

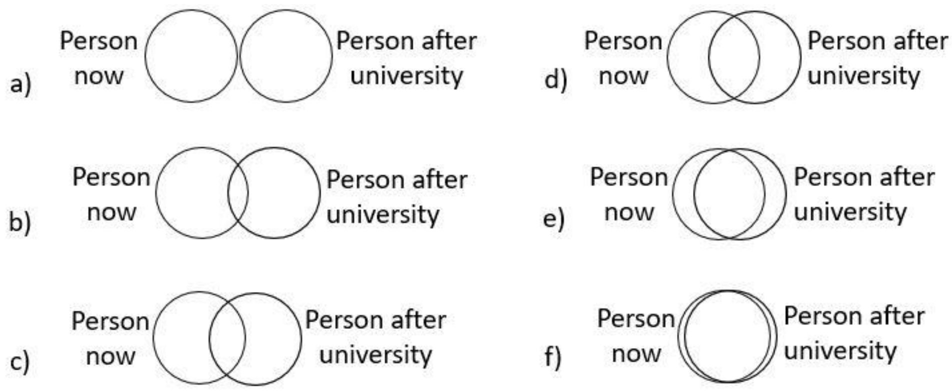
Response on 7-point scale (1 = Not at all; 7 = Very much)

Perceived Identity-Expressiveness

- To what extent do you feel that doing this activity would express something about your identity? *(1 = Would not at all express my identity; 7 = Would very much express my identity)*
- To what extent do you feel that doing this activity would say something about who you are as a person, such your personality traits, goals, or values? *(1 = Would not say anything about me as a person; 7 = Would say a lot about me as a person)*

Self-Reported Psychological Connectedness

- Please think about the important characteristics that make you the person you are now, and use the drop-down box below to select the diagram that best reflects the degree of connectedness you feel between the person you are now and the person you will be after leaving university, where no overlap means 'completely disconnected' and complete overlap means 'completely connected.'



- Thinking again about the important characteristics that make you the person you are now, please rate the degree of similarity you feel between the person you are now and the person you will be after leaving university, where 0 means 'I will be completely different' and 100 means 'I will be exactly the same'.

Self-Concept Clarity (Campbell et al., 1996)

All on 5-point scale (*1 = Strongly disagree, 5 = Strongly agree*).

- My beliefs about myself often conflict with one another. [RC]
- On one day I might have one opinion of myself and on another day I might have a different opinion. [RC]
- I spend a lot of time wondering about what kind of person I really am. [RC]
- Sometimes I feel that I am not really the person that I appear to be. [RC]
- When I think about the kind of person I have been in the past, I'm not sure what I was really like. [RC]
- I seldom experience conflict between the different aspects of my personality.
- Sometimes I think I know other people better than I know myself. [RC]
- My beliefs about myself seem to change very frequently. [RC]

- If I were asked to describe my personality, my description might end up being different from one day to another day. [RC]
- Even if I wanted to, I don't think I could tell someone what I'm really like. [RC]
- In general, I have a clear sense of who I am and what I am.
- It is often hard for me to make up my mind about things because I don't really know what I want. [RC]

Implicit Theory Scale (Dweck, 1999)

All on 6-point scale (*1 = Strongly disagree, 6 = Strongly agree*)

- Everyone is a certain kind of person, and there is not much that they can do to really change that. (reverse-scored)
- The kind of person someone is is something basic about them, and it can’t be changed very much. (reverse-scored)
- People can do things differently, but the important parts of who they are can’t really be changed. (reverse-scored)
- As much as I hate to admit it, you can’t teach an old dog new tricks. People can’t really change their deepest attributes. (reverse-scored)
- People can change even their most basic qualities.
- Everyone, no matter who they are, can significantly change their basic characteristics.
- People can substantially change the kind of person who they are.
- No matter what kind of person someone is, they can always change very much.

Control Variables

- Are you a full-time student? (Yes, No)
- When do you expect to graduate from university? (2024, 2025, 2026, 2027 or later)
- Are you a full-time student (Yes, No)
- Are you attending university online or in-person? (Online, In-person)

Attention Check

- Which of the following statements best describes what you were asked to write about in the previous task? (How I may change after graduating form university; How I may stay the same after graduating from university; What I enjoy about university, What I don't enjoy about university)

Appendix C – Chapter 2: Supplementary Analyses

Study 1

Table 1. *Zero-order correlations with similarity/uncertainty of future characteristics (mean of personality, goals, likes & dislikes, belief, values ratings)*

Measures	**Similarity**	**Uncertainty**
Psychological connectedness	.59***	-.42***
Visual perspective	-.20***	.15**
Pre-experiencing	.006	-.04
Broader meaning	-.02	-.04
Perceived insight	.26***	-.30***
Online self-concept consistency	.44***	-.41***

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

Table 2. *Zero-order correlations with self-reported psychological connectedness for subsample of participants reporting both events within 1-3 year window*

	Psychological connectedness		
Measures	***r*(223)**	***p***	**95% CI**
Pre-experiencing	-.06	.381	[-.19, .07]
Visual perspective	-.30	<.001	[-.42, -.18]
Broader meaning	-.20	.003	[-.32, -.07]
Perceived insight	.19	.004	[.06, .31]
Online self-concept consistency	.49	<.001	[.39, .59]
Meaning - Event	-.13	.047	[-.26, -.002]
Meaning – Self-identity focus	-.21	.002	[-.33, -.08]

Table 3. *Coefficients for multiple linear regression analyses on future thinking measures (shows no significant moderation by experimental condition*).

Predictors	***b***	***SE***	***p***
	Pre-experiencing		
Connectedness scale	-0.09	0.08	.201
Exp. condition	0.00	0.14	1.00
Interaction term	0.02	0.15	.916
	Visual perspective		
Connectedness scale	-0.29	-.09	.002
Exp. condition	-0.14	0.17	.400
Interaction term	0.11	0.19	.543
	Broader meaning		
Connectedness scale	-0.19	0.06	.002
Exp. condition	0.10	0.11	.367
Interaction term	0.06	0.13	.618
	Perceived insight		
Connectedness scale	0.13	0.04	.004
Exp. condition	0.02	0.08	.862
Interaction term	0.06	0.09	.481
	Online Self-Concept Consistency		
Connectedness scale	0.32	0.03	<.001
Exp. condition	-0.18	0.07	.011
Interaction term	-0.06	0.08	.397

Note. Separate regression model computed for each future thinking outcome variable

Study 2

Analyses for Separate Broader Meaning vs. Concrete Details Measures

Broader Meaning1 = mean of BIF-style items across activities (e.g., “Please use the scale below to indicate the extent to which you feel this activity is best described as either running along the street or supporting a worthy cause."

Broader Meaning2 = mean response to following item across activities ("When thinking about this activity, to what extent do you focus on the specific details (i.e., practical steps or processes) involved in performing the activity, or on the broader meaning (i.e., wider significance or purpose) of the activity?")

Table 4. *2 x 6 ANOVA on Broader Meaning1 measure*

Factors	***F***	**df**	***p***
Exp. condition	2.44	(1, 276)	.119
Activity type	18.68	(5, 1380)	<.001
Interaction term	0.90	(5, 1380)	.480

Table 5. *2 x 6 ANOVA on Broader Meaning2 measure*

Factors	***F***	**df**	***p***
Exp. condition	0.59	(1, 276)	.444
Activity type	15.98	(5, 1380)	<.001
Interaction term	1.50	(5, 1380)	.187

Table 6. *Zero-order correlations with Broader Meaning1 and Broader Meaning 2 measures*

Measures	**Broader Meaning1**	**Broader Meaning2**
Psychological connectedness	-.08	-.01
Self-concept clarity	.26***	.24***
Implicit theory	-.13*	-.03
Affective valence	.57***	.45***
Identity-expressiveness	.51***	.47***

* *p* < .05 ** *p* <.01 *** *p* <.001

Table 7. *Zero-order correlations with implicit theory of change scale*

	Implicit theory scale	
Measures	***r*(277)**	***p***
Psychological connectedness	.01	.835
Self-concept clarity	-.11	.077
Broader meaning	-.09	.153
Affective valence	-.07	.243
Identity-expressiveness	-.01	.822

Broader Meaning, Affective Valence, Identity-Expressiveness by Activity Type

Table 8. *Descriptive statistics by activity type*

	Broader meaning		Affective valence		Identity-expressiveness	
Activities	*M*	*SD*	*M*	*SD*	*M*	*SD*
Charity race	5.10	1.38	4.85	1.28	4.91	1.32
Donate blood	4.77	1.66	4.12	1.33	4.76	1.40
Help friend move	4.77	1.36	5.03	1.02	4.73	1.33
Job interview	4.62	1.36	4.40	1.24	4.40	1.41
Going to the gym	4.74	1.35	5.13	1.12	4.41	1.47
Travel abroad	5.51	1.21	6.38	0.75	5.02	1.42

Table 9. *Mean broader meaning pairwise comparisons between activities*

Activity		Mean diff	SE	p
Charity race	Donate blood	0.32	0.09	0.001
	Help friend move	0.32	0.10	0.002
	Job interview	0.47	0.10	<.001
	Going to the gym	0.35	0.11	0.001
	Travel abroad	-0.43	0.09	<.001
Donate blood	Charity race	-0.32	0.09	0.001
	Help friend move	0.00	0.11	0.982
	Job interview	0.15	0.11	0.180
	Going to the gym	0.03	0.12	0.795
	Travel abroad	-0.75	0.11	<.001
Help friend move	Charity race	-0.32	0.10	0.002
	Donate blood	0.00	0.11	0.982
	Job interview	0.15	0.11	0.170
	Going to the gym	0.03	0.11	0.765

	Travel abroad	-0.75	0.10	<.001
Job interview	Charity race	-0.47	0.10	<.001
	Donate blood	-0.15	0.11	0.180
	Help friend move	-0.15	0.11	0.170
	Going to the gym	-0.12	0.10	0.232
	Travel abroad	-0.90	0.10	<.001
Going to the gym	Charity race	-0.35	0.11	0.001
	Donate blood	-0.03	0.12	0.795
	Help friend move	-0.03	0.11	0.765
	Job interview	0.12	0.10	0.232
	Travel abroad	-0.78	0.10	<.001
Travel abroad	Charity race	0.43	0.09	<.001
	Donate blood	0.75	0.11	<.001
	Help friend move	0.75	0.10	<.001
	Job interview	0.90	0.10	<.001
	Going to the gym	0.78	0.10	<.001

Table 10. *Mean affective valence pairwise comparisons between activities*

Activity		Mean diff	SE	*p*
Charity race	Donate blood	0.73	0.09	<.001
	Help friend move	-0.19	0.09	0.032
	Job interview	0.45	0.09	<.001
	Going to the gym	-0.28	0.09	0.001
	Travel abroad	-1.53	0.08	<.001
Donate blood	Charity race	-0.73	0.09	<.001
	Help friend move	-0.92	0.09	<.001
	Job interview	-0.28	0.09	0.003
	Going to the gym	-1.01	0.09	<.001
	Travel abroad	-2.26	0.09	<.001
Help friend move	Charity race	0.19	0.09	0.032
	Donate blood	0.92	0.09	<.001

	Job interview	0.64	0.08	<.001
	Going to the gym	-0.09	0.08	0.248
	Travel abroad	-1.34	0.06	<.001
Job interview	Charity race	-0.45	0.09	<.001
	Donate blood	0.28	0.09	0.003
	Help friend move	-0.64	0.08	<.001
	Going to the gym	-0.73	0.08	<.001
	Travel abroad	-1.98	0.08	<.001
Going to the gym	Charity race	0.28	0.09	0.001
	Donate blood	1.01	0.09	<.001
	Help friend move	0.09	0.08	0.248
	Job interview	0.73	0.08	<.001
	Travel abroad	-1.25	0.07	<.001
Travel abroad	Charity race	1.53	0.08	<.001
	Donate blood	2.26	0.09	<.001
	Help friend move	1.34	0.06	<.001
	Job interview	1.98	0.08	<.001
	Going to the gym	1.25	0.07	<.001

Table 11. *Mean identity-expressiveness pairwise comparisons between activities*

	Activity	**Mean diff**	**SE**	***p***
Charity race	Donate blood	0.15	0.09	0.090
	Help friend move	0.17	0.10	0.082
	Job interview	0.50	0.10	<.001
	Going to the gym	0.49	0.10	0.000
	Travel abroad	-0.11	0.10	0.275
Donate blood	Charity race	-0.15	0.09	0.090
	Help friend move	0.03	0.09	0.778
	Job interview	0.36	0.11	0.001
	Going to the gym	0.34	0.11	0.002
	Travel abroad	-0.26	0.11	0.019

Help friend move	Charity race	-0.17	0.10	0.082
	Donate blood	-0.03	0.09	0.778
	Job interview	0.33	0.10	0.001
	Going to the gym	0.32	0.11	0.004
	Travel abroad	-0.29	0.10	0.004
Job interview	Charity race	-0.50	0.10	<.001
	Donate blood	-0.36	0.11	0.001
	Help friend move	-0.33	0.10	0.001
	Going to the gym	-0.01	0.10	0.911
	Travel abroad	-0.62	0.11	<.001
Going to the gym	Charity race	-0.49	0.10	<.001
	Donate blood	-0.34	0.11	0.002
	Help friend move	-0.32	0.11	0.004
	Job interview	0.01	0.10	0.911
	Travel abroad	-0.61	0.11	<.001
Travel abroad	Charity race	0.11	0.10	0.275
	Donate blood	0.26	0.11	0.019
	Help friend move	0.29	0.10	0.004
	Job interview	0.62	0.11	<.001
	Going to the gym	0.61	0.11	<.001

Identity-Expressiveness Correlations by Activity Type

Table 12. *Psychological connectedness zero-order correlations with identity-expressiveness for each activity type*

Activity	***r***	***p***
Charity race	-.12	.053
Donate blood	-.03	.637
Help friend move house	-.05	.398
Job interview	-.09	.148
Going to the gym	-.08	.200
Travel abroad	-.15	.011

A liner mixed regression analysis on identity-expressiveness ratings, with random effects for participant, and psychological connectedness and activity type as predictors, revealed no significant improvement in model fit when adding the psychological connectedness-by-activity cross-level interaction, $\chi^2(5) = 3.61$, $p = .607$.

Multilevel Correlations for Activity Measures

Table 13. *Multilevel correlations between broader meaning, affective valence, and identity-expressiveness*

Measures	Broader meaning	Affective valence
Broader meaning		
Affective valence	*r* =.42 [.38, .46]	
Identity-expressiveness	*r* =.42 [.38, .46]	*r* =.41 [.36, .45]

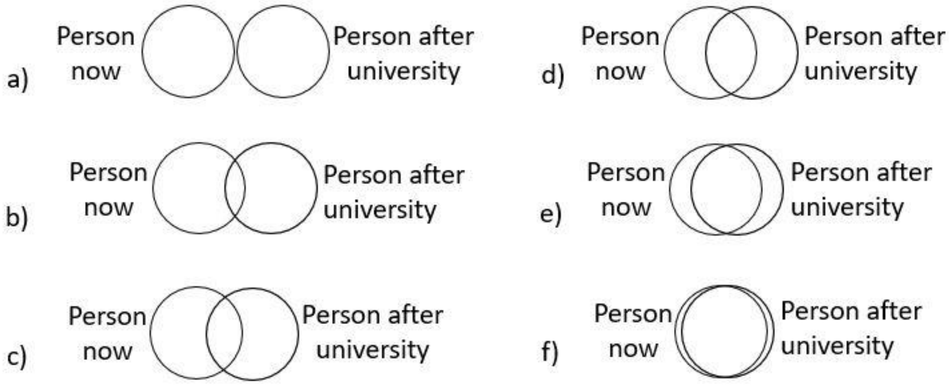
Appendix D – Chapter 3: Materials & Measures

Study 1

Psychological Connectedness

Responses across the two items will be z-transformed and then combined into a single scale of Psychological Connectedness.

- Please think about the important characteristics that make you the person you are now, and use the drop-down box below to select the diagram that best reflects the degree of connectedness you feel between the person you are now and the person you will be after leaving university, where no overlap means 'completely disconnected' and complete overlap means 'completely connected.'



- Thinking again about the important characteristics that make you the person you are now, please rate the degree of similarity you feel between the person you are now and the person you will be after leaving university, where 0 means 'I will be completely different' and 100 means 'I will be exactly the same'.

Attribute Importance Ratings

Identity-attribute importance scales = participant mean importance rating across identity attributes (separate job and travel scales)

Concrete-attribute importance scales = participant mean importance rating across concrete (i.e., practical/hedonic) attributes (separate job and travel scales)

Relative identity-attribute importance scales = identity-attribute importance scale minus concrete-attribute importance scale (separate job and travel scales)

Jobs

"Please rate how important each of the following things are to you in choosing a job after leaving university."

(All on 7-point scale, 1 = Not at all important, 7 = Very important)

- Having an influential role within a company/organisation. [identity]

- Having flexible working hours. [concrete]
- Working for a prestigious company/organisation. [identity]
- Being able to work from home. [concrete]
- Having a job that is considered important by other people. [identity]
- Having a generous holiday allowance. [concrete]
- Working for an ethical company/organisation. [identity]
- Receiving a good salary. [concrete]
- Having a positive impact on society. [identity]
- Having a job where the work isn't too challenging. [concrete]
- Making a positive difference to the lives of other people. [identity]
- Receiving perks and benefits, such as retail discounts/vouchers. [concrete]

Travel

"Now imagine you are planning to travel abroad after leaving university. Please rate how important each of the following things are for you to experience while travelling."

(All on 7-point scale, 1 = Not at all important, 7 = Very important)

- Ensuring you have no negative impact on the environment. [identity]
- Staying in comfortable and modern accommodation. [concrete]
- Giving back to local communities. [identity]
- Experiencing good weather. [concrete]
- Visiting places of historical and cultural interest. [identity]
- Spending time on nice beaches. [concrete]
- Learning about different customs and cultures. [identity]
- Staying in areas with nice places to eat. [concrete]

- Participating in adventurous activities. [identity]
- Spending time relaxing. [concrete]

Participant Identity-Expressiveness Ratings

(All on 7-point scale, 1 = Not at all, 7 = Very much)

Jobs

“Thinking again about future jobs after leaving university, please rate the extent to which you feel having a job with each of the following characteristics would say something positive about who you are as a person.”

- Having an influential role in a company/organisation would say something positive about who I am as a person. [identity]
- Having flexible working hours would say something positive about who I am as a person. [concrete]
- Working for a prestigious company/organisation would say something positive about who I am as a person. [identity]
- Being able to work from home would say something positive about who I am as a person. [concrete]
- Having a job that is considered important by other people would say something positive about who I am as a person. [identity]
- Having a generous holiday allowance would say something positive about who I am as a person. [concrete]
- Working for an ethical company/organisation would say something positive about who I am as a person. [identity]
- Receiving a good salary would say something positive about who I am as a person. [concrete]

- Having a job with a positive impact on society would say something positive about who I am as a person. [identity]
- Having a job where the work isn't too challenging would say something positive about who I am as a person. [concrete]
- Having a job where I make a positive difference to the lives of other people would say something positive about who I am as a person. [identity]
- Receiving perks and benefits, such as retail discounts/vouchers would say something positive about who I am as a person. [concrete]

Travel

"Thinking again about if you were to spend time travelling abroad after leaving university, please rate the extent to which you feel each of the following experiences while travelling would reflect positively on who you are as a person."

- Ensuring I have no negative impact on the environment while travelling would say something positive about who I am as a person. [identity]
- Staying in comfortable and modern accommodation while travelling would say something positive about who I am as a person. [concrete]
- Giving back to local communities while travelling would say something positive about who I am as a person. [identity]
- Experiencing good weather while travelling would say something positive about who I am as a person. [concrete]
- Visiting places of historical and cultural interest while travelling would say something positive about who I am as a person. [identity]
- Spending time on nice beaches while travelling would say something positive about who I am as a person. [concrete]

- Learning about different customs and cultures while travelling would say something positive about who I am as a person. [identity]
- Staying in areas with nice places to eat while travelling would say something positive about who I am as a person. [concrete]
- Participating in adventurous activities while travelling would say something positive about who I am as a person. [identity]
- Spending time relaxing while travelling would say something positive about who I am as a person. [concrete]

Student Identity-Centrality (Bowman & Felix, 2017)

(All on 7-point scale, 1 = Strongly disagree, 7 = Strongly agree)

- Being a student is an important reflection of who I am.
- In general, being a student is an important part of my self-image.
- Being a student is unimportant to my sense of what kind of a person I am. [reverse-coded]

Perceived Transition Importance

(All on 7-point scale, 1 = Strongly disagree, 7 = Strongly agree)

- Leaving university will mark an important transition in my life.
- My time during and after university feel like different chapters in my life.

Multiple Group Membership (Iyer et al., 2009)

(All on 7-point scale, 1 = Strongly disagree, 7 = Strongly agree)

- I am currently a member of several different groups.
- I have strong ties with several different groups.
- I join in the activities of several different groups.

- At the moment I am a member of only one group. [RC]

Control Variables

- Graduation perceived temporal distance (1 = feels very near; 7 = feels very far away)
- Expected graduation year
- Already have job/travel plans for after leaving university (yes/no)
- How certain are you about what job you will do after graduating (1 = not at all certain; 7 = completely certain)
- Full-time student (yes/no)

Study 2

Psychological Connectedness Manipulation

Low Connectedness

"In the first year of university, students often have new experiences, meet a diverse range of people, form new relationships, and are exposed to different ideas and perspectives.

The first year of university can therefore be transformative, with students often reporting feeling like a different person at the end of their first year compared to when they started.

Thinking about the traits and characteristics that make you the person you are now, please spend a few minutes writing about some important things about yourself that might change during your first year of university."

High Connectedness

"In the first year of university, students often have new experiences, meet a diverse range of people, form new relationships, and are exposed to different ideas and perspectives.

Despite these experiences, students often report a strong sense of stability in who they are as a person throughout their first year of university.

Thinking about the traits and characteristics that make you the person you are now, please spend a few minutes writing about some important things about yourself that you expect to remain the same throughout your first year of university."

Attribute Rating Task

Identity-attribute importance scales = participant mean importance rating across identity attributes (separate job and travel scales)

Concrete-attribute importance scales = participant mean importance rating across concrete (i.e., practical/hedonic) attributes (separate job and travel scales)

Relative identity-attribute importance scales = identity-attribute importance scale minus concrete-attribute importance scale (separate job and travel scales)

Jobs

"Imagine you are planning to work over the summer after your first year of university. Please rate how important each of the following things are to you in choosing a job."

(All on 7-point scale, 1 = Not at all important, 7 = Very important)

- Working for a prestigious brand/organisation [identity]
- Flexible working hours [concrete]
- Helping the local community [identity]
- Being able to work from home [concrete]
- Working for an ethical brand/organisation [identity]

- Generous holiday allowance [concrete]
- Having a positive impact on society [identity]
- A job where the work isn't too challenging [concrete]
- Making a positive difference to the lives of other people [identity]
- Receiving perks and benefits, such as retail discounts/vouchers [concrete]

Travel

"Now imagine you are planning to travel abroad over the summer after your first year of university. Please rate how important each of the following things are for you to experience while travelling."

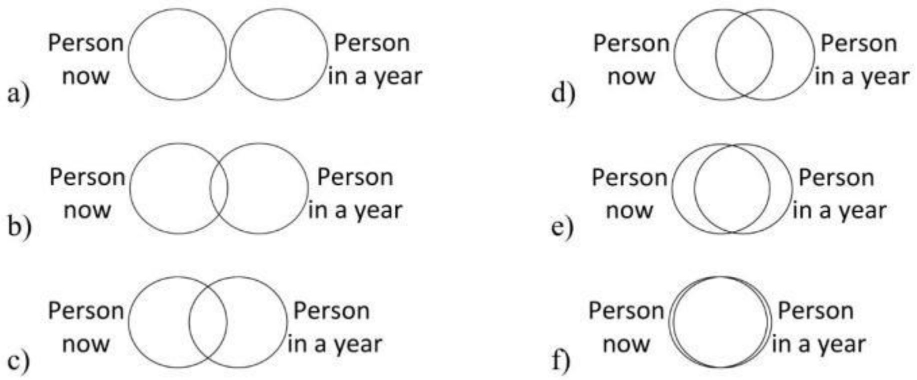
(All on 7-point scale, 1 = Not at all important, 7 = Very important)

- Ensuring you have no negative impact on the environment [identity]
- Staying in comfortable and modern accommodation [concrete]
- Giving back to local communities [identity]
- Experiencing good weather [concrete]
- Visiting places of historical and cultural interest [identity]
- Being close to supermarkets and other local amenities [concrete]
- Learning about different customs and cultures. [identity]
- Convenient local transport options [concrete]
- Participating in adventurous activities [identity]
- Spending time relaxing [concrete]

Self-Reported Psychological Connectedness

Responses across the two items will be z-transformed and then combined into a single scale of Perceived Psychological Connectedness.

- Please think about the important characteristics that make you the person you are now, and use the drop-down box below to select the diagram that best reflects the degree of connectedness you feel between the person you are now and the person you will be in a year, where no overlap means ‘completely disconnected’ and complete overlap means ‘completely connected.’



- Thinking again about the important characteristics that make you the person you are now, please rate the degree of similarity you feel between the person you are now and the person you will be in a year, where 0 means 'I will be completely different' and 100 means 'I will be exactly the same'.

Self-Concept Clarity (Campbell, 1996)

(All on 5-point scale, 1 = Strongly disagree, 5 = Strongly agree)

- My beliefs about myself often conflict with one another. [RC]
- On one day I might have one opinion of myself and on another day I might have a different opinion. [RC]
- I spend a lot of time wondering about what kind of person I really am. [RC]
- Sometimes I feel that I am not really the person that I appear to be. [RC]
- When I think about the kind of person I have been in the past, I’m not sure what I was really like. [RC]

- I seldom experience conflict between the different aspects of my personality.
- Sometimes I think I know other people better than I know myself. [RC]
- My beliefs about myself seem to change very frequently. [RC]
- If I were asked to describe my personality, my description might end up being different from one day to another day. [RC]
- Even if I wanted to, I don't think I could tell someone what I'm really like. [RC]
- In general, I have a clear sense of who I am and what I am.
- It is often hard for me to make up my mind about things because I don't really know what I want. [RC]

Ideal vs. Pragmatic Future Self

- "An idealistic person is someone who places principles and values before practical considerations, while a pragmatic person is someone who is strongly guided by practical considerations.

  When you imagine yourself a year from now, to what extent do you see yourself being a pragmatic person or an idealistic person?" [1= extremely pragmatic, 7 = extremely idealistic]

Future Self-Positiveness

- How positive do you feel about the person you expect to be a year from now? [1 = not at all positive, 7 = very positive]

Control Variables

- Are you living in student accommodation? [yes, no]
- Do you currently have plans to work over the summer after your first year of university? [yes, no]

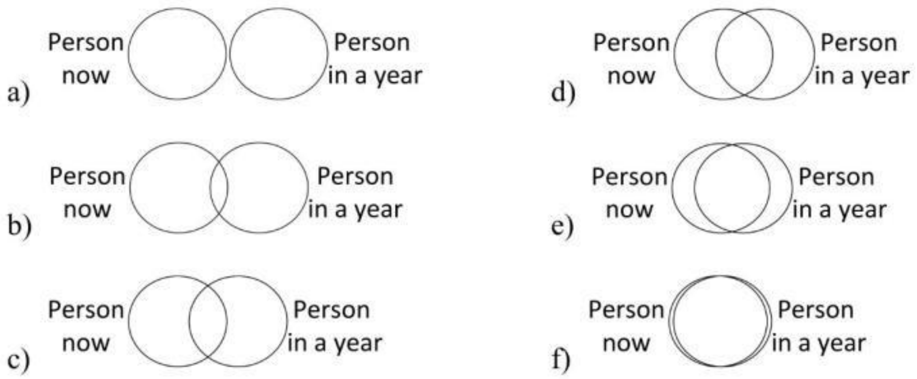
- Do you currently have plans to travel over the summer after your first year of university? [yes, no]

Study 3A

Psychological Connectedness

Responses across the two items will be z-transformed and then combined into a single scale of Perceived Psychological Connectedness.

- Please think about the important characteristics that make you the person you are now, and use the drop-down box below to select the diagram that best reflects the degree of connectedness you feel between the person you are now and the person you will be in a year, where no overlap means ‘completely disconnected’ and complete overlap means ‘completely connected.’



- Thinking again about the important characteristics that make you the person you are now, please rate the degree of similarity you feel between the person you are now and the person you will be in a year, where 0 means 'I will be completely different' and 100 means 'I will be exactly the same'.

Travel Attribute Rating Task

<u>Identity-attribute importance scales</u> = participant mean importance rating across identity attributes

Concrete-attribute importance scales = participant mean importance rating across concrete (i.e., practical/hedonic) attributes

Relative identity-attribute importance scale = identity-attribute importance scale minus concrete-attribute importance scale

"Imagine you are thinking of travelling abroad a year from now. Please rate how important each of the following things are for you to experience while travelling."

(All on 7-point scale, 1 = Not at all important, 7 = Very important)

- Ensuring you have no negative impact on the environment [identity]
- Staying in comfortable and modern accommodation. [concrete]
- Giving back to local communities. [identity]
- Experiencing good weather. [concrete]
- Visiting places of historical and cultural interest. [identity]
- Spending time on nice beaches. [concrete]
- Learning about different customs and cultures. [identity]
- Staying in areas with nice places to eat. [concrete]
- Participating in adventurous activities. [identity]
- Spending time relaxing. [concrete]

Attribute Perceived Identity-Relevance

(All on 7-point scale, 1 = Not at all; 7 = Very much).

"Thinking again about if you were to spend time travelling abroad a year from now, please rate the extent to which you feel each of the following experiences while travelling would say something about who you are as a person."

- Ensuring I have no negative impact on the environment while travelling would say something about who I am as a person. [identity]
- Staying in comfortable and modern accommodation while travelling would say something about who I am as a person. [concrete]
- Giving back to local communities while travelling would say something about who I am as a person. [identity]
- Experiencing good weather while travelling would say something about who I am as a person. [concrete]
- Visiting places of historical and cultural interest while travelling would say something about who I am as a person. [identity]
- Spending time on nice beaches while travelling would say something about who I am as a person. [concrete]
- Learning about different customs and cultures while travelling would say something about who I am as a person. [identity]
- Staying in areas with nice places to eat while travelling would say something about who I am as a person. [concrete]
- Participating in adventurous activities while travelling would say something about who I am as a person. [identity]
- Spending time relaxing while travelling would say something about who I am as a person. [concrete]

Self-Concept Clarity (Campbell, 1996)

(All on 5-point scale, 1 = Strongly disagree, 5 = Strongly agree)

- My beliefs about myself often conflict with one another. [RC]

- On one day I might have one opinion of myself and on another day I might have a different opinion. [RC]
- I spend a lot of time wondering about what kind of person I really am. [RC]
- Sometimes I feel that I am not really the person that I appear to be. [RC]
- When I think about the kind of person I have been in the past, I'm not sure what I was really like. [RC]
- I seldom experience conflict between the different aspects of my personality.
- Sometimes I think I know other people better than I know myself. [RC]
- My beliefs about myself seem to change very frequently. [RC]
- If I were asked to describe my personality, my description might end up being different from one day to another day. [RC]
- Even if I wanted to, I don't think I could tell someone what I'm really like. [RC]
- In general, I have a clear sense of who I am and what I am.
- It is often hard for me to make up my mind about things because I don't really know what I want. [RC]

Dimensions of Identity Development Scale (DIDS; Luyckx et al., 2008)

- I have decided on the direction I want to follow in life.
- I know what I want to do with my future.
- I have a clear view on my future.
- I have made a choice concerning some of my plans for the future.
- I know what I want to achieve in my life.
- My plans for the future offer me a sense of security.
- My future plans give me self-confidence.

- Because of the path of life I have mapped out, I feel certain about myself.
- I sense that the direction I want to take in life will really suit me.
- I value my plans for the future very much.
- I think a lot about the direction I want to take in my life.
- I think a lot about how I see my future.
- I try to figure out regularly which lifestyle would suit me.
- I think a lot about what to do with my life.
- I try to find out which lifestyle would be good for me.
- I think a lot about the future plans I have made.
- I talk regularly with other people about the plans for the future I have made.
- I work out for myself if the goals I put forward in life really suit me.
- I try to find out regularly what other people think about the specific direction I want to take in my life.
- I think a lot about the future plans I strive for.
- I keep looking for the direction I want to take in my life.
- I am doubtful about what I really want to achieve in life.
- I keep wondering which direction my life has to take.
- I worry about what I want to do with my future.
- It is hard to stop thinking about the direction I want to follow in life.

Visual Perspective

“When imagining future events, most people picture the event in one of two ways. One way people picture the event is as an outside observer, looking at the scene from an external vantage point, where the person can see themselves in the event. Another way people picture the event is through their own eyes, from roughly the same viewpoint it would be experienced.

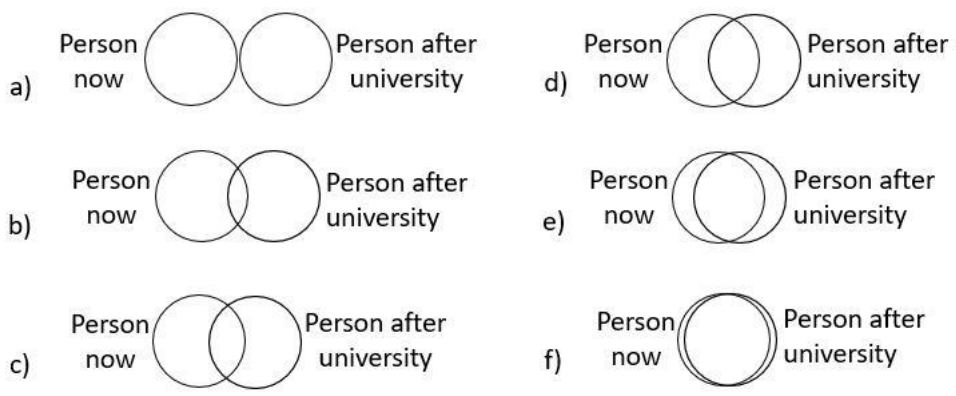
When you imagine yourself travelling abroad a year from now, to what extent does it come to you as though you are an outside observer or as though you are seeing it through your own eyes?" [1 = Entirely through own eyes; 7 = Entirely as an observer].

Study 3B

Psychological Connectedness

Responses across the two items will be z-transformed and then combined into a single scale of Psychological Connectedness.

- Please think about the important characteristics that make you the person you are now, and use the drop-down box below to select the diagram that best reflects the degree of connectedness you feel between the person you are now and the person you will be after leaving university, where no overlap means 'completely disconnected' and complete overlap means 'completely connected.'



- Thinking again about the important characteristics that make you the person you are now, please rate the degree of similarity you feel between the person you are now and the person you will be after leaving university, where 0 means 'I will be completely different' and 100 means 'I will be exactly the same'.

Attribute Importance Ratings

Identity-attribute importance scales = participant mean importance rating across identity attributes (separate job and travel scales)

Concrete-attribute importance scales = participant mean importance rating across concrete (i.e., practical/hedonic) attributes (separate job and travel scales)

Relative identity-attribute importance scales = identity-attribute importance scale minus concrete-attribute importance scale (separate job and travel scales)

Jobs

"Please rate how important each of the following things are to you in choosing a job after leaving university."
(All on 7-point scale, 1 = Not at all important, 7 = Very important)

- Having an influential role within a company/organisation. [identity]
- Having flexible working hours. [concrete]
- Working for a prestigious company/organisation. [identity]
- Being able to work from home. [concrete]
- Having a job that is considered important by other people. [identity]
- Having a generous holiday allowance. [concrete]
- Working for an ethical company/organisation. [identity]

- Receiving a good salary. [concrete]
- Having a positive impact on society. [identity]
- Having a job where the work isn't too challenging. [concrete]
- Making a positive difference to the lives of other people. [identity]
- Receiving perks and benefits, such as retail discounts/vouchers. [concrete]

Travel

"Now imagine you are planning to travel abroad after leaving university. Please rate how important each of the following things are for you to experience while travelling."

(All on 7-point scale, 1 = Not at all important, 7 = Very important)

- Ensuring you have no negative impact on the environment [identity]
- Staying in comfortable and modern accommodation [concrete]
- Giving back to local communities [identity]
- Experiencing good weather [concrete]
- Visiting places of historical and cultural interest [identity]
- Being close to supermarkets and other local amenities [concrete]
- Learning about different customs and cultures. [identity]
- Convenient local transport options [concrete]
- Participating in adventurous activities [identity]
- Spending time relaxing [concrete]

Participant Identity-Expressiveness Ratings

(All on 7-point scale, 1 = Not at all, 7 = Very much)

Jobs

"Thinking again about future jobs after leaving university, please rate the extent to which you feel having a job with each of the following characteristics would say something positive about who you are as a person."

- Having an influential role in a company/organisation would say something positive about who I am as a person. [identity]
- Having flexible working hours would say something positive about who I am as a person. [concrete]
- Working for a prestigious company/organisation would say something positive about who I am as a person. [identity]
- Being able to work from home would say something positive about who I am as a person. [concrete]
- Having a job that is considered important by other people would say something positive about who I am as a person. [identity]
- Having a generous holiday allowance would say something positive about who I am as a person. [concrete]
- Working for an ethical company/organisation would say something positive about who I am as a person. [identity]
- Receiving a good salary would say something positive about who I am as a person. [concrete]
- Having a job with a positive impact on society would say something positive about who I am as a person. [identity]
- Having a job where the work isn't too challenging would say something positive about who I am as a person. [concrete]

- Having a job where I make a positive difference to the lives of other people would say something positive about who I am as a person. [identity]
- Receiving perks and benefits, such as retail discounts/vouchers would say something positive about who I am as a person. [concrete]

Travel

"Thinking again about if you were to spend time travelling abroad after leaving university, please rate the extent to which you feel each of the following experiences while travelling would reflect positively on who you are as a person."

- Ensuring I have no negative impact on the environment while travelling would say something positive about who I am as a person. [identity]
- Staying in comfortable and modern accommodation while travelling would say something positive about who I am as a person. [concrete]
- Giving back to local communities while travelling would say something positive about who I am as a person. [identity]
- Experiencing good weather while travelling would say something positive about who I am as a person. [concrete]
- Visiting places of historical and cultural interest while travelling would say something positive about who I am as a person. [identity]
- Spending time on nice beaches while travelling would say something positive about who I am as a person. [concrete]
- Learning about different customs and cultures while travelling would say something positive about who I am as a person. [identity]
- Staying in areas with nice places to eat while travelling would say something positive about who I am as a person. [concrete]

- Participating in adventurous activities while travelling would say something positive about who I am as a person. [identity]
- Spending time relaxing while travelling would say something positive about who I am as a person. [concrete]

Overall Identity-Attribute Importance Scale

(All on 7-point scale, 1 = Not at all important, 7 = Very important)

Job and travel attributes as described above.

Leisure time task introduced as: “Thinking about your leisure time after graduating from university, please rate how important each of the following things are to you.”

Mobile phone task introduced as: “Imagine you are buying a new mobile phone after graduating from university. Please rate how important each of the following factors is in choosing which phone to buy.”

<u>Identity-attribute importance scale</u> = participant mean importance rating across identity attributes

<u>Relative identity-attribute importance scale</u> = identity-attribute importance scale minus concrete-attribute importance scale

Table 14. *List of attributes for overall scales*

Domain	**Identity**	**Concrete**
Job	Having an influential role within a company/organisation.	Having flexible working hours.
	Working for a prestigious company/organisation.	Being able to work from home.
	Having a job that is considered important by other people.	Having a generous holiday allowance.
	Working for an ethical company/organisation.	Receiving a good salary.
	Having a positive impact on society.	Having a job where the work isn't too challenging.
	Making a positive difference to the lives of other people.	Receiving perks and benefits, such as retail discounts/vouchers.
Mobile phone	Ethically manufactured.	Good camera quality.
	Made from sustainable materials.	Large storage capacity.
Leisure time	Taking on challenges.	Personal entertainment (e.g., Netflix, video games).
	Learning a new skill.	Relaxing and unwinding.
Travel	Ensuring you have no negative impact on the environment.	Staying in comfortable and modern accommodation.
	Giving back to local communities.	Experiencing good weather.
	Visiting places of historical and cultural interest.	Spending time on nice beaches.
	Learning about different customs and cultures.	Staying in areas with nice places to eat.
	Participating in adventurous activities.	Spending time relaxing.

Self-Continuity Scale (Hong et al., 2024)

(All on 7-point scale, 1 = Not at all, 7 = Very much)

- There is continuity in my life – from present to the future after leaving university.
- I feel connected to my future self after leaving university.
- I feel connected to who I will be in the future after leaving university.
- Important aspects of my personality will remain the same after leaving university.

Student Identity-Centrality (Bowman & Felix, 2017)

(All on 7-point scale, 1 = Strongly disagree, 7 = Strongly agree)

- Being a student is an important reflection of who I am.
- In general, being a student is an important part of my self-image.
- Being a student is unimportant to my sense of what kind of a person I am. [reverse-coded]

Perceived Transition Importance

(All on 7-point scale, 1 = Strongly disagree, 7 = Strongly agree)

- Leaving university will mark an important transition in my life.
- My time during and after university feel like different chapters in my life.

Control Variables

- Graduation perceived temporal distance (1 = feels very near; 7 = feels very far away)
- Expected graduation year
- Already have job/travel plans for after leaving university (yes/no)

- Staying in full-time education after finishing undergraduate degree (yes/no)
- Current course degree apprenticeship (yes/no)
- Full-time student (yes/no)

Pro-Environmental Intentions Task (Exploratory)

Participants randomly assigned to either rate intentions to perform pro-environmental actions in the present ("Thinking about yourself in the here-and-now, please rate how likely or unlikely you would be to perform each of the following actions") or the future after leaving university ("Thinking about yourself in the future after leaving university, please rate how likely or unlikely you would be to perform each of the following actions"

Responses to following items all provided on 7-point scale (1 = very unlikely, 7 = very likely).

Combined into single scale by taking mean response across the 8 items.

- Recycle old electronics (such as batteries and mobile phones).
- Recycle old clothes.
- Boycott companies with poor environmental practices.
- Participate in a protest about an environmental issue.
- Volunteer for an environmental or wildlife protection charity.
- Donate to an environmental or wildlife protection charity.
- Pay more for environmentally friendly products.
- Make a special effort to buy products made from sustainable materials.

Appendix E – Chapter 3: Supplementary Analyses

Study 1

Table 15. *Correlations with Student Identity-Centrality, Perceived Transition Importance, and Multiple Group Membership Scales*

Measures	SIC	TI	MGM
PC Scale	-.17**	-.29***	-.07
Connectedness	-.11	-.24***	-.02
Similarity	-.18**	-.27**	-.11
Job Attribute Importance Ratings			
Identity	.25***	.18**	.18**
Practical	.11	-.02	-.14*
Travel Attribute Importance Ratings			
Identity	.06	.24***	.18**
Hedonic	.11	.17**	-.03

SIC = Student identity-centrality; TI = transition importance; MGM = multiple group membership; PC = psychological connectedness

df = 244

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

Table 16. *Paired comparisons of participant identity-expressiveness ratings for job attributes (paired- samples t-tests)*

Attribute Comparison	***t***	***p***
Influential - Flexible	10.826	<.001
Influential - Homeworking	13.024	<.001
Influential - Holiday	11.855	<.001
Influential - Salary	3.936	<.001
Influential - Not challenging	12.821	<.001
Influential - Perks/benefits	15.875	<.001
Prestigious - Flexible	9.776	<.001
Prestigious - Homeworking	11.651	<.001
Prestigious - Holiday	11.12	<.001
Prestigious - Salary	2.648	.009
Prestigious - Not challenging	10.857	<.001
Prestigious - Perks/benefits	14.191	<.001
Important - Flexible	11.141	<.001
Important - Homeworking	13.448	<.001
Important - Holiday	12.197	<.001
Important - Salary	5.28	<.001
Important - Not challenging	13.084	<.001
Important - Perks/benefits	16.105	<.001
Ethical - Flexible	15.901	<.001
Ethical - Homeworking	18.325	<.001
Ethical - Holiday	17.157	<.001
Ethical - Salary	10.471	<.001

Ethical - Not challenging	18.491	<.001
Ethical - Perks/benefits	20.217	<.001
Positive society - Flexible	18.862	<.001
Positive society - Homeworking	21.737	<.001
Positive society- Holiday	19.916	<.001
Positive society - Salary	13.407	<.001
Positive society- Not challenging	22.046	<.001
Positive society - Perks/benefits	23.435	<.001
Positive diff. others - Flexible	19.155	<.001
Positive diff. others - Homeworking	21.64	<.001
Positive diff. others - Holiday	19.751	<.001
Positive diff. others - Salary	13.019	<.001
Positive diff. others - Not challenging	21.772	<.001
Positive diff. others - Perks/benefits	23.142	<.001

df = 245

Table 17. *Paired comparisons of participant identity-expressiveness ratings for travel attributes (paired- samples t-tests)*

Attribute Comparison	***t***	***p***
Environment - Accommodation	15.153	<.001
Environment - Weather	17.282	<.001
Environment - Beaches	17.157	<.001
Environment - Food	13.787	<.001
Environment - Relaxing	11.962	<.001
Communities - Accommodation	18.442	<.001

Communities - Weather	19.952	<.001
Communities - Beaches	20.611	<.001
Communities - Food	16.637	<.001
Communities - Relaxing	15.328	<.001
Hist & Cult Interest- Accommodation	13.506	<.001
Hist & Cult Interest - Weather	16.723	<.001
Hist & Cult Interest - Beaches	16.216	<.001
Hist & Cult Interest - Food	11.568	<.001
Hist & Cult Interest - Relaxing	9.593	<.001
Learning customs - Accommodation	18.218	<.001
Learning customs - Weather	20.234	<.001
Learning customs - Beaches	21.015	<.001
Learning customs - Food	16.522	<.001
Learning customs - Relaxing	14.659	<.001
Adventure - Accommodation	10.438	<.001
Adventure - Weather	13.584	<.001
Adventure - Beaches	13.802	<.001
Adventure - Food	9.579	<.001
Adventure - Relaxing	7.362	<.001

df = 245

Table 18. *Identity-relevant attribute correlations with psychological connectedness Scale*

Choice	Identity-Based Attribute	Connectedness Scale
Travel	Environment	-.25**
	Communities	-.30**
	Hist & Cult Interest	-.20**
	Learning customs	-.24**
	Adventure	-.19**
Job	Influential	-.14*
	Prestigious	-.15*
	Important	-.11
	Ethical	-.10
	Positive society	-.18**
	Positive diff. others	-.14*

df = 244

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

Table 19. *Psychological connectedness partial correlations with job and travel attribute importance, controlling for graduation year and perceived temporal distance to graduation*

Future Self Measures	Attribute Importance					
	Travel			Job		
	Identity	Hedonic	Relative	Identity	Practical	Relative
PC Scale	-.35***	-.12	-.19**	-.21***	-.01	-.07
Similarity	-.27***	-.10	-.14*	-.14*	-.001	-.06
Connected	-.34***	-.11	-.19**	-.22***	-.02	-.10

PC = Psychological connectedness

df = 242

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

Study 2

Table 20. *Psychological connectedness partial correlations with job and travel attribute importance, controlling for future self-positiveness and idealism vs. pragmatism*

Future Self Measures	Attribute Importance: Travel			Job		
	Identity	**Hedonic**	**Relative**	**Identity**	**Practical**	**Relative**
PC Scale	-.15	-.12	-.03	-.09	-.10	-.01
Similarity	-.20*	-.14	-.05	-.07	-.09	.00
Connected	-.07	-.07	.00	-.09	-.09	-.01

PC = Psychological connectedness

df = 149

* $p < .05$

Study 3B

Table 21. *Future self-similarity and connectedness & similarity partial correlations with travel attribute importance, controlling for graduation year and perceived temporal distance to graduation*

Future Self Measures	Travel Attribute Importance: Identity	Hedonic
Similarity	-.13*	-.05
Connectedness	-.02	-.08

df = 315

* $p < .05$

Appendix F – Chapter 4: Content Analysis Codebook

Table 22.

Code	Scoring	Descriptions	Example 1	Example 2
Clarity of future plans	0 = Not mentioned 1 = Not sure what to do 2 =Possible/vague plans 3 = Concrete/clear plans	• Code as 0 if postcard does not mention anything about future plans after university. • Code as 1 if postcard explicitly mentions not being sure about what to do with their life/what career they want to do, hoping to figure out what they want to do in life, needing to decide on a job/career path • Code as 2 if postcard mentions a possible future job/education plans, but is noncommittal (e.g., recognises they might change their mind, or qualifies with "perhaps", "maybe", phrases it as a question to their future self), or mentions several possible	Coded 0: To future me, I hope you graduate and enjoy uni more than school. Hopefully you learnt to hack the nights out. I wonder how many lectures i will sleep through. Hopefully you can make some good friends. Coded 1: Dear [name], I hope you had a fun time at uni and graduated with a good degree. I also hope you made good friends for life and that you are still with [name]. I also hope you actually know what job you want to do in your life lol. love from [name]	Coded 0: Dear [name], I hope you have made some friends and are enjoying the course. hope you find some good house mates. Coded 1: Dear Future Self, I hope you are more familiar + at ease with the whole uni experience and the work. Right now I have no idea what its going to be like which is scary. I chose to study here because I liked the uni at the open day + didn't want to go to Leeds because all my friends were going there so I wanted a fresh start. I don't know what I wanna do after uni so I

		jobs/future plans. • Also code as 2 if the plan is broad/general (e.g., get a job in psychology) • Code as 3 if postcard mentions a single specific future job (e.g., clinical psychologist) or other plan (e.g., get my masters) without qualification. • Also code as 3 if postcard mentions that they have a plan (without qualifying it) but does not say what it is (see Example 2)	Coded 2: Well, you know that what brings me to UoN was the fencing. Tbf, I'm hoping that by now you're actually doing internationals babes. Psychology is just cool, I'm thinking maybe you might go into clinical psychology or maybe forensics. Who knows? You still wanna do a first responder course? Well, tbf I hope that I actually get to make some friends that are long-time love :). Hopefully, I graduate (fingers crossed) and I actually allowed myself to go through the whole uni experience. you go [name], you rock! Love, past-time [name] Coded 3: Dear [name], Why am I at this uni you may ask? It is a great	hope this helps me figure that out and I can just have a fun few years. I just hope I don't feel too overwhelmed with everything and I know bits will be challenging but that it will all work out okay. Coded 2: To me, Do you still love psychology? Have you decided what you want to do with your degree yet? Forensic or clinical psychologist? I hope you've found a job to stick to throughout university. Right now, I will aim to get a first at the end of the studies. I also hope [name] has grown bigger! We also better still be with [name], he's the best! Love from me! xxxxxx Coded 3: To my future self: Hey! I'm so tried

			campus with quite nice people and the open day sold me. Why Psychology? It's nice to connect with your mind and understand why we are the way we are. In this degree, I wanna pass with a first. This degree will help me achieve my future job which is a hospital clinical psychologist. Love from, your year one future self	rn. Anyways, I'm here at Nottingham to study psychology and become rich +famous (jk). I just really like psychology + Nottingham is pretty. I hope to get a good degree + some invaluable experiences and learn + grow into a better woman. I have plans for what I want to do after my degree so I hope I stick with it and work hard but also have a fun time! My socks are wet and my coat is drenchhed so please buy an umbrella!!! love you (I think?) (ps I'm proud of you)
Maintain current goals or interests	0 = Not present 1 = Present	• Expresses a desire or hope for goals or interests not to change. • Wants to continue to pursue current goals, interests, or hobbies. • Hopes that they will continue to enjoy things that they currently enjoy.	Right now we love psychology and hope that has stayed the same	Also I hope you pursued music in some way because you're good and more importantly, you love it.

		• Do not code here if postcard only expresses a desire for a goal to be achieved (e.g., "better get a 1st") - it is about the individual's desire to still want the same goal or to have the same interests.		
Maintain existing relationships	0 = Not present 1 = Present	• Expresses a hope or desire for current relationships (e.g., with friends, family, or romantic partner) to be maintained. • Can refer to direct expressions of desire for relationships to be maintained, or a desire/reminder to do activities which are important for maintaining relationships (e.g., visit friends, calling parents often, etc.). • Don't code here if postcard merely mentions a relationship or questions whether future self still has same relationship - must	I hope we tried lots of things met lots of people and kept calling mum & dad lots.	I hope you've stayed in contact with all your school friends and gone to Manchester and Portsmouth to visit.

		express a motivation or desire for relationship to continue		
Stay true to myself	0 = Not present 1 = Present	• Expresses a desire not to change as a person, not to lose oneself	I hope I stay true to myself and not lose myself in an attempt to get people to like me because I love myself and others will too	Try something new but stay true to myself
Maintain lifestyle or values	0 = Not present 1 = Present	• Other desire to maintain values, beliefs, and general lifestyle e.g., maintain religious beliefs and moral values, continuing to be a hard worker. • Only code here if postcard refers to maintaining these things. For example, "I hope to work hard" would not alone be sufficient to code here, but "keep up my work ethic" would be.	Remember not to pursue the money - the purpose is to help people, and be humble enough to trust God to provide.	I hope you continue to cook well + eat well and look after yourself.
Life journey metaphors	0 = Not present 1 = Present	• Uses a metaphor to describe their progress through life as a journey. • May refer to how far	I'm sure you won't forget but keep reflecting on your past	I want to be patient with myself on this journey of self

		they have come, next steps, a journey, routes, paths, etc.,	and how far you've come	discovery and self growth
Reflection on A-levels/school	0 = Not present 1 = Present	• Describes something about what they felt/thought about their experiences of A-levels, GCSE, school. • May refer to something they enjoyed, found difficult, something they learned etc. • Don't code here unless they describe something about their experience of A-levels (e.g., saying "I did psychology at A-level" is not sufficient to be coded here, but saying "I enjoyed psychology at A-level" is)	really loved it at A-level so I do hope that continues	I also hope that uni was nowhere near as stressful and traumatic as A-levels were, surely you've recovered from the trauma by now!
Other autobiographical reflection	0 = Not present 1 = Present	• Makes reference to things that have happened to them in their past or specific past events they have experienced. • May refer to specific events (Example 1) or their past more generally	It was always going to be Nottingham, from the time we first talked to dad about it in year 9 in a Costa and he told you 'oh that one's apparently really good'. And now here we are.	So proud of you for doing it, after everything thats happened

		(Example 2). • Note - don't code here if the same section of text has been coded in "Refers to their experience of A-levels/school".		
Relates current situation or future expectations to enduring aspects of the self	0 = Not present 1 = Present	• Explains or contextualises current situation by referring to a relatively enduring aspects of the self or what it is like to be them (e.g., their traits, characteristics, tendencies, interests) (Example 1). • Explains or contextualises expectations for the future by referring to relatively enduring aspects of the self or what it is like to be them (e.g., traits, characteristics, tendencies, interests) (Example 2). • By "enduring", it means something they've always liked or been interested in, traits or characteristics	I chose to study Psychology because I've always wanted to learn more about the reasoning behind people's actions	I would hope that you're graduating with a first but I know it's not always so easy for us so as long as you tried your best

		they've always had, or what things are usually like for them. Must contain some reference to being enduring/persistent. For example, "I find psychology really interesting" is NOT sufficient to be coded here// but "I've always been interested in psychology" is. • Note - don't code here if the same section of text has been coded in "Refers to their experience of A-levels/school". • Note -in contrast to codes within the 'Desire for Stability in Self' category, this code isn't about a desire or hope that something about the self will remain the same in the future. It is about contextualising one's present situation or future expectations within a broader autobiographical		

		framework of knowledge/beliefs about the self.		
Increase self-confidence or social skills	0 = Not present 1 = Present	• Hopes or expects to increase their self-confidence - both socially and generally becoming more sure of themselves • Improve their social skills, become less nervous in talking to people • More sure of self, confident in own abilities and capacities	I rlly wanna get better socially & i hope to feel more confident in social situations and in myself.	I hope you finally make some friends and stop being shy and nervous
More independent	0 = Not present 1 = Present	• Hopes or expects to become more independent	I hope my time at university builds upon my independence,	You chose notts because its not too close to home that you couldnt be the independent person you wanted to be (are right now?)

Improve self/grow	0 = Not present 1 = Present	• Expresses a general hope/expectation to grow or improve as a person. • May mention growing as a person, self-growth, becoming a better me, working to improve oneself, etc.	I want to be patient with myself on this journey of self discovery and self growth, I want to love the person I will become and be proud of her because I know I am worth it, I have worked for it and I deserve it. I will become the best version of myself and I will build the successful, happy future that I deserve.	My aims, goals, and hopes for my time at university are to perform exceedingly well, succeed, but really learn from all kinds of lessons and experiences, and finally be a stronger, better version of me.
Leave comfort zone	0 = Not present 1 = Present	• Mentions stepping out of their comfort zone/what they are comfortable with	I hope to have expanded my interests and stepped more out of my comfort zone in particular contexts	Be kind to everyone & be brave enough to step out of what Im comfortable with.
Physical appearance	0 = Not present 1 = Present	• Hopes/expects their physical appearance to change (e.g., change body through exercise) • Wonders about possible changes in appearance (note - these may be perceived as undesirable changes, see Example 2)	Can't wait to see how you look without braces!! (if they still are on that's embarrassing).	Hopefully you actually went to the gym and haven't doubled in size XD

Improve mental health	0 = Not present 1 = Present	• Hopes their mental health will improve - become less anxious, less stressed, or general improvement in mental health	You've been in Nottingham since Saturday, and you're still a bit debilitatingly anxious. I hope you feel better by the time you're reading this.	I hope that you're graduating happy and slightly more mentally stable
Other self-growth or change	0 = Not present 1 = Present	• Mentions other self-change or self-improvement that doesn't fit in other categories (e.g., become kinder, more organised)	I hope you're better at decision making	I hope you are more organised now and don't miss every deadline
Self-pride	0 = Not present 1 = Present	• Says they are proud of themselves or want/expect to be proud of themselves in the future. • Only code for self-pride here - not making others proud.	I'm proud of you & I love you	If you stayed, I'm so proud of your strength.
Self-worth	0 = Not present 1 = Present	• Describes self as deserving or worthy of success/friends/love/being treated well.	Just remember you deserve all the best things in life and you deserved your place at Uni of Nottingham.	I want to love the person I will become and be proud of her because I know I am worth it, I have worked for it and I deserve it. I will become the best version of myself and I will build the successful,

				happy future that I deserve
Compliment self	0 = Not present 1 = Present	• Praises themselves for who they are as a person or for their achievements/progress	Firstly, just by getting that far is incredible. Life throws shit at us but we still power through.	You're amazin and you're gonna go far.
Be good to yourself	0 = Not present 1 = Present	• Wants to look after themselves well, be kind to themselves, not to put too much pressure on themselves	I want to look after myself effectively,	I hope everything has gone well and we are about to graduate with a good degree (and that you haven't put too much pressure on yourself over the years)
Make friends/friendship groups	0 = Not present 1 = Present	• Wants to/wonders about making friends or being involved in a friendship group	I hope you've found your people	I hope to make some really strong friendships.
Meet people	0 = Not present 1 = Present	• Wants to meet people or make connections with others. • Talks about finding nice people, meeting interesting people etc. • Not specified as making friends or finding a friendship group.	Hoping to meet lots of new people,	make connections to people
New romantic partner	0 = Not present 1 = Present	• Wonders whether they will meet a romantic partner, or says that they	Do you have a boyfriend??	Also hope your not single still

		hope to meet a partner • Don't code here if postcard references an existing relationship (e.g., are you still with [name]?)		
Get involved in clubs & societies	0 = Not present 1 = Present	• Wants to join clubs/societies and get involved in communities • Don't code here if postcards references only playing sport (rather than joining a sports club/team), or if postcard references a desire to make it on to a particular team (e.g., play for the 1st team) - instead code this under "Sporting success" in the "Achievement-oriented" category	get involved and be a part of socities	I hope I've joined some sports clubs - rowing? netbal? badminton?
Feel at home	0 = Not present 1 = Present	• Wants to feel settled/at home at Nottingham	I hope you've found your people and feel at home here.	I hope we have settled in to the city
Academic success	0 = Not present 1 = Present	• References to academic success - mentions a specific grade (e.g., get a 1st), wanting to do well in their degree, achieve a good degree, etc	I have come to uni to get a first class degree in psychology	I hope to become successful in my studies

Sporting success	0 = Not present 1 = Present	• Mentions a sporting goal, like making it into a sports team	I picked the uni because of its great reputation sportwise (you better be in the netball first team by now)	I hope to achieve a first in my degree and fence on the women's 1s and 2s at uni for BUCS!!
Work hard	0 = Not present 1 = Present	• Plans to work hard	I wanna use my competitive side and I intend to work my arse off to be the best.	Just be happy & work hard :)
Get rich	0 = Not present 1 = Present	• Mentions wanting to make money or be rich	I can't wait for the day I graduate (hopefully with a first) and finally get a job that pays a lot of money	You also better bet rich in the future or I'll be very upset.
Have fun/enjoy it	0 = Not present 1 = Present	• Postcard mentions having fun, a good time, or enjoying oneself, or related phrases. • May refer to having fun/enjoying uni in general, or enjoying the course/modules.	I really hope you had a great time here	I am going to Nottingham because I want to have fun
Novel experiences	0 = Not present 1 = Present	• An interest in having new experiences, trying things out.	I would like to try new things	just generally open myself up to new experiences
Make memories	0 = Not present 1 = Present	• Wants to make memories	made memories to last a life time.	I hope you have some good memories

Experience student/uni life	0 = Not present 1 = Present	• Mentions experiencing student life, having the full university experience	Hopefully, I graduate (fingers crossed) and I actually allowed myself to go through the whole uni experience	I hope you gunna have an unforgettable studying experience
Make the most of it	0 = Not present 1 = Present	• Wants to make the most of the opportunity/their time at university	I am hoping you will have taken advantage of the opportunities that you have been given. Make the most of it!	take it slow and take time to enjoy it here while i'm still here. make most of it
Nightlife & alcohol	0 = Not present 1 = Present	• References to the nightlife, hangovers, or alcohol	found a subject I loved and a place with cheap beer	and because the social aspect/ nightlife is supposed to be good in Notts.
Like the campus/facilities	0 = Not present 1 = Present	• Mentions liking the campus or facilities	I came to Nottingham because I loved the campus on an open day	It is a great campus
Explore Nottingham	0 = Not present 1 = Present	• Mentions an interest/desire in exploring Nottingham	I bet you explored all of Notts to a T (:))	I came to Nottingham to explore cities other than London.

Appendix G – Chapter 4: Content Analysis Code Frequencies

Table 23.

Category/Sub-Category	Code	*n*	%
Self-Stability		**53**	**25**
	Goals & interests	30	14
	Relationships	16	8
	Values	9	4
	Stay true to self	7	3
Autobiographical Reasoning		**65**	**31**
	Life journey metaphors	31	15
	School/A-levels reflection	19	9
	Enduring self-aspects	11	5
	Other autobiographical reflection	10	5
Growth & Self-Change		**79**	**38**
	Self-confidence and social skills	37	18
	Improve/grow as a person	21	10
	Change in physical appearance	10	5
	Independence	9	4
	Leave comfort zone	7	3
	Improve mental health	7	3
	Other self-change	10	5
Relationships & Belonging		**119**	**57**
	Make friends	89	43
	Meet people	31	15
	Get involved/join clubs & societies	27	13
	Feel at home	10	5
	New romantic partner	9	4
Achievement		**89**	**43**
	Academic success	68	33

	Work hard	22	11
	Get rich/make money	9	4
	Sporting success	6	3
Enjoyment		**97**	**47**
	Have fun/enjoy it	71	34
	Novel experiences	18	9
	Make the most of it	11	5
	Make memories	8	4
	Explore the city	6	3
	Experience student life	5	2
Future Plans		**90**	**43**
	Uncertain/no plan	26	13
	Possible/vague plan	44	21
	Concrete plan	20	10
Self-Praise/Kindness		**68**	**33**
	Expression of pride	43	21
	Self-praise/compliment	36	17
	Be kind to yourself	9	4
	Self-worth	8	4
Campus & Nightlife		**45**	**22**
	Nightlife & alcohol	24	12
	Campus/facilities	23	11

Appendix H – Chapter 5: Materials & Measures

Visual Perspective-Taking Task Instructions

"The following task will require you to respond quickly and accurately. Please make sure you are free from any distractions. Each trial of this task will feature a room like this [example image displayed on screen], with a person standing in the centre and some red dots on the wall. Your task is to verify the number of red dots that are visible, either from your own perspective (the entire room) or from the perspective of the other person in the room. Before seeing each image, you will either be shown the word HE or the word YOU, and then a number (e.g., 1). When shown the word HE, your job is to verify whether the number of dots the other person can see matches the previously shown number. When presented with the word YOU, your job is to verify whether the number of dots that you can see matches the previously shown number. If the number of dots visible from the target perspective (HE or YOU) matches the previously shown number, press C on the keyboard. If it doesn't match, press the N on the keyboard.

MATCHES = C on the keyboard

DOES NOT MATCH = N on the keyboard

e.g., for the image currently on screen, if you had just seen the word HE and the number 1, you would press C on the keyboard, because the other person can see 1 red dot. Whereas if you had just seen the word YOU and the number 1, you would press the N on the keyboard, because you can see a different number of dots. Please try to be as fast as possible with your responses while still being accurate. The task will begin with some practice trials to get you used to the task.

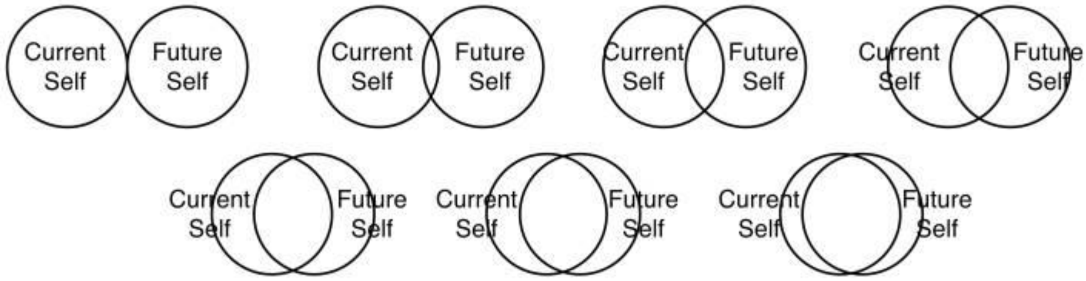
Press spacebar or enter to begin the task. Or press R if you want to read the instructions again."

Psychological Connectedness

"Please take a moment to think about the person you will be ten years from now."

"Please click on the pair of circles that best reflects how connected you feel to your future self ten years from now."

"Now please click on the pair of circles that best reflects how similar you think your future self ten years from now will be to yourself now."



Interpersonal Reactivity Index

FS= Fantasy; EC = Empathic concern; PT = Perspective-taking; PD = Personal distress

(1 = Does not describe me well; 5 = describes me very well)

1. I daydream and fantasize, with some regularity, about things that might happen to me.

(FS)

2. I often have tender, concerned feelings for people less fortunate than me. (EC)

3. I sometimes find it difficult to see things from the other person's point of view.. (PT) (reverse scored)

4. Sometimes I don't feel very sorry for other people when they are having problems. (EC)

(reverse scored)

5. I really get involved with the feelings of the characters in a novel. (FS)

6. In emergency situations, I feel apprehensive and ill-at-ease. (PD)

7. I am usually objective when I watch a movie or play, and I don't often get completely

caught up in it. (FS) (reverse scored)

8. I try to look at everybody's side of a disagreement before I make a decision. (PT)

9. When I see someone being taken advantage of, I feel kind of protective towards them.

(EC)

10. I sometimes feel helpless when I am in the middle of a very emotional situation. (PD)

11. I sometimes try to understand my friends better by imagining how things look from

their perspective. (PT)

12. Becoming extremely involved in a good book or movie is somewhat rare for me. (FS) (reverse scored)

13. When I see someone get hurt, I tend to remain calm. (PD) (reverse scored)

14. Other people's misfortunes do not usually disturb me a great deal. (EC) (reverse scored)

15. If I'm sure I'm right about something, I don't waste much time listening to other

people's arguments. (PT) (reverse scored)

16. After seeing a play or movie, I have felt as though I were one of the characters. (FS)

17. Being in a tense emotional situation scares me. (PD)

18. When I see someone being treated unfairly, I sometimes don't feel very much pity for

them. (EC) (reverse scored)

19. I am usually pretty effective in dealing with emergencies. (PD) (reverse scored)

20. I am often quite touched by things that I see happen. (EC)

21. I believe that there are two sides to every question and try to look at them both. (PT)

22. I would describe myself as a pretty soft-hearted person. (EC)

23. When I watch a good movie, I can very easily put myself in the place of a leading character. (FS)

24. I tend to lose control during emergencies. (PD)

25. When I'm upset at someone, I usually try to "put myself in his shoes" for a while. (PT)

26. When I am reading an interesting story or novel, I imagine how I would feel if the events in the story were happening to me. (FS)

27. When I see someone who badly needs help in an emergency, I go to pieces. (PD)

28. Before criticizing somebody, I try to imagine how I would feel if I were in their place. (PT)

Appendix I: Chapter 5 Supplementary Analyses

Correlations with Indifference Point at each Delay Length

Table 24. *Psychological connectedness correlations with intertemporal choice indifference point at each delay length.*

	Psychological Connectedness	
Delay Length	***r***	***p***
1 week	.01	.93
1 month	.01	.88
6 months	.10	.15
1 year	.09	.22
5 years	.04	.59

Table 25. *Egocentric bias error-rate and RT correlations with intertemporal choice indifference point at each delay length.*

Egocentric Bias	**1 Week**		**1 Month**		**6 Months**		**1 Year**		**5 Years**	
	r	***p***	***r***	***p***	***r***	***p***	***r***	***p***	***r***	***p***
Error-rate	-.17	.01	-.17	.02	-.10	.18	-.11	.12	-.08	.29
RT	.02	.74	-.06	.42	.05	.50	.03	.68	.09	.20

RT = response time

Perspective-Taking x Subjective SES Interactions – Error-Rate Model

Table 26. *Regression coefficients for perspective-taking measures and subjective socioeconomic status on temporal discounting (AUC).*

Variables	Model 1				Model 2			
	β	***b***	***SE***	***p***	***β***	***b***	***SE***	***p***
SES	.06	0.01	0.01	.42	.01	0.01	0.01	.36
IRI-PT	-.01	-0.002	0.02	.93	-.01	-0.002	0.02	.91
Egocentric Bias ER	-.15	-0.02	0.01	.03	-.15	-0.02	0.01	.05
IRI-PT x SES	.18	0.04	0.01	.01	.18	0.04	0.01	.01
Egocentric Bias ER x SES	.04	0.003	0.01	.61	.01	0.01	0.01	.38
Altercentric Bias ER					-.02	-0.002	-0.02	.81
Altercentric Bias ER x SES					-.11	-0.01	0.01	.11

Note. IRI-PT = interpersonal reactivity index: perspective-taking; SES = subjective socioeconomic status; SE = standard error of unstandardised coefficient; ER = error-rate. Variables involved in interactions were mean-centred. *Model 1,* $R^2_{adj} = .03, F(5, 194) = 2.16, p = .06.$ *Model 2,* $R^2_{adj} = .03, F(7, 192) = 1.91, p = .07.$