CONSTRUAL LEVEL IS STABLE WITHIN-PERSON OVER TIME: A REPEATED-MEASURES STUDY OF CONSTRUAL LEVEL AND OUTCOMES

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ABSTRACT

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Construal level — essentially, whether you are focusing on the forest or the trees — has proven itself a consequential and highly-predictive variable in the workplace. This paper aimed to extend the construal level literature in two major areas. First, it attempted to develop and validate a new measure of construal level capable of capturing the four dimensions of psychological distance that underpin construal level. Second, this study aimed to understand individual differences in construal level more deeply by capturing a distribution of daily construal levels within-person, and testing whether patterns of stability and fluctuation in these distributions are associated with meaningful differences in work-related outcomes between-person. A new measure of psychological distance was constructed with four independent factors, and it was shown to predict several work-related outcomes relevant to construal level. However, the new measure did not correlate with existing measures of construal level. Next, in a repeated measures study, construal level measured with the Behavior Identification Form exhibited excellent within-person stability across five days. Average construal level was shown to positively predict visioning behaviors, and negatively predict avoidance motivation. Ultimately, this dissertation bolsters the case that there are stable individual differences in construal level between-person, and provides some initial evidence that these differences have work-related consequences.

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Introduction

An accountant who needs to focus on concrete details most of the time may on some days need to 'zoom out' and think abstractly to invent a new procedure or re-prioritize their work. Likewise, a CEO who typically needs to keep the 'big picture' in mind may also sometimes need to zoom-in to focus on the day-to-day realities on the ground. For both of these roles, the ability to successfully traverse an inner zoom lens in response to job demands (i.e., switching between the forest and the trees) may be as important to their overall performance as to whether they are particularly adept at focusing on either the forest or on the trees.

This inner zoom lens was termed *construal level* by Trope and Liberman (2010) and predicts meaningful outcomes across many different fields including marketing, clinical psychology, neuroscience, social psychology, and organizational science (Dar & Katz, 2005; Stephan et al., 2010; Stillman et al., 2017; White et al., 2011; Wiesenfeld et al., 2017). In the workplace, construal level relates to several crucial foci including leadership (Berson et al., 2015), power dynamics (Smith & Trope, 2006), strategy and tactics (Wiesenfeld et al., 2017), setting and pursuing goals (Davis et al., 2016), ethics (Tumasjan et al., 2011), communication (Reyt et al., 2016), and motivation. Construal-level's broad relatedness to work-psychological phenomenon may be due in part to its relationship with a fundamental tension in the workplace: between vision (which is high construal) and execution (which is low construal; Wiesenfeld et al., 2017). In a sense, successful work *is* the successful management of abstract ideas and concrete products, which suggests that the management of construal level is a significant contributor to job performance.

History of Construal Level

In their seminal paper, Trope and Liberman (2010) introduced Construal Level Theory (CLT). Construal level is proposed as the cognitive-psychological mechanism by which people

mentally ‘zoom out’ and see the abstract essence of something, or ‘zoom-in’ closer to focus on its concrete, detailed properties. It is assumed in Construal Level Theory that people frequently shift construal levels throughout the day, even moment-to-moment. Although this daily construal fluctuation has been under-studied, Trope and Liberman’s (2010) original series of studies did empirically identify the triggers that determine *when* we switch construal levels (i.e., what prompts us to zoom in or zoom out).

According to Trope and Liberman (2010), fluctuations in construal level are a function of fluctuations in psychological distance, which is defined as how close or far one perceives themselves to be from a target. Psychological distance is broken down into four dimensions: spatial distance, temporal distance, social distance, and hypotheticality. Where there is a shift in any of these dimensions (towards psychological closeness or farness), there is a shift in construal level towards more concrete or abstract processing.

How Construal Level is Manipulated

Researchers typically manipulate construal level by priming distance or closeness on one of the above dimensions, and then measuring the outcomes of the resulting high or low construal state. For example, Trope and Liberman (2000) manipulated construal level through Temporal Distance by asking participants to consider applying for a job either next week or a year from now. Fujita et al. (2006a) manipulated construal level through Spatial Distance by asking participants to consider helping someone rent an apartment either in their home city or a foreign city. Nenkov (2012) manipulated social distance by asking participants to consider buying a healthy drink either for themself or for a family member. Armor and Sackett (2006) manipulated hypotheticality by asking participants to estimate their performance on a task that they would (or would not) need to actually perform.

How Construal Level is Measured

Most of the construal level literature utilizes a unidimensional, forced-choice measure of construal level called the Behavior Identification Form (BIF; Vallacher & Wegner, 1989). Introduced eleven years prior to modern construal-level theory (later proposed by Trope and Liberman [2000]), the BIF presents a series of actions (e.g., picking an apple), and then asks individuals to choose between two interpretations of that action; one more abstract (e.g., getting something to eat), the other more concrete (e.g., pulling the apple from a branch). In this, it measures how abstractly one thinks about those actions.

As an outcome measure, the BIF is used to test novel manipulations of construal level. For example, Bähr and Marguc (2011) trained participants in mindfulness meditation, proposing that frequent meditation would alter construal level, and concluded that this hypothesis was unsupported when regular meditation failed to significantly change scores on the BIF. The BIF is also used as a manipulation check to ensure that manipulations aimed at shifting a particular psychological distance dimension are successful. A popular research design pattern is to manipulate one of the four psychological distance dimensions, verify its impact on overall construal level as shown by increased or decreased scores on the BIF, and then observe how that construal shift impacts valued outcomes. For example, Fujita et al. (2006b) used a series of exercises to manipulate construal level in order to test construal level's impact on self-control; they administered the BIF after each exercise to verify its impact on construal level.

In addition to responding to experimental manipulations, some evidence suggests that stable individual differences exist in construal level. Although Construal Level Theory was proposed to explain momentary fluctuations in abstract and concrete processing, the BIF was originally introduced as an assessment of stable individual differences in the tendency to process

actions either abstractly or concretely. Vallacher and Wegner (1989) argued that by capturing people's processing frame across different domains of actions (e.g., from picking an apple, to traveling by car, to having a cavity filled), their BIF measure assessed the generalizable tendency towards either abstract or concrete processing across situations. To test this, they administered their BIF measure twice to the same participants over a period of 2 weeks and found a test-retest reliability of .91, which supported within-person stability in construal level. This original study still stands as one of the few that administered the BIF to the same participants more than once, and is thus one of the few that provides a test-retest reliability estimate. Many studies since have theorized construal level as an individual difference, but have tended to operationalize 'stable' construal level with a single administration of the BIF.

Two Opportunities to Deepen the Literature

As a psychological construct, construal level has proven itself both highly generative and robust. Trope and Liberman's original (2010) paper introducing the concept has been cited over 3745 times, and although it was introduced by psychologists, construal level's core characteristics and effects have been reproduced across myriad fields including neuroscience (Stillman et al., 2017). Despite all of this predictive power and promise, there are at least two hindering limitations in the construal level literature that, if addressed, could propel construal level research forward in needed new directions and with a deeper understanding of its fundamental characteristics.

Opportunity #1: A Multidimensional Measure of Construal Level

First, in studying construal level, researchers are often measuring a multi-faceted construct (i.e., 4-dimensions of psychological distance produce construal level) using a unidimensional measure (the BIF). This limits the questions we can ask and the phenomena we

can observe precisely. Using the unidimensional BIF as a manipulation check or outcome measure for construal level presents unique problems that researchers currently spend effort trying to work around. First, the BIF can be too imprecise to use as a manipulation check in some studies. If a researcher wishes to manipulate a particular dimension of psychological distance in order to affect participants' construal level, there is no direct measure at the moment with which to assess the precise manipulation effect on the targeted psychological distance change. Instead, researchers must often create in-house measures designed specifically for individual studies, or use analogous measures that approximate their targeted dimension.

For example, recall Fujita et al.'s (2006a) study that manipulated spatial distance by asking participants to imagine helping a stranger pick out an apartment either close by in their hometown or in a foreign city (New York City). Fujita et al. (2006a) included a manipulation check in which participants were asked to rate their familiarity with New York City. The authors were concerned that familiarity with NYC could introduce unintended psychological closeness in the *hypotheticality* dimension (familiar targets are less hypothetical), thus suppressing the 'farness' they intended to create with their *spatial* distance manipulation. In addition to the hypotheticality dimension, this manipulation might have also triggered a social distance effect, as participants were choosing an apartment for a stranger (vs. themselves). Thus, in this example, three kinds of countervailing psychological distances may occur to prompt a change in construal level. These different distances may confound results. Until a multi-dimensional measure is developed to capture the different types of psychological distance separately, these confounding effects cannot be easily teased apart.

Without a multidimensional measure of construal level, researchers are also limited in the questions they can ask and the relationships they can investigate easily. For example, the

compatibility principle suggests that measures will have a stronger relationship with outcomes when the scope of the predictor and criterion are the same (Ajzen, 2005; Ajzen & Fishbein, 1977; Johnson et al., 2012a). That is, using a broad predictor to predict a narrow outcome can lead to a weaker relationship than matching the scope of the predictors and outcome (Ajzen & Fishbein, 1977; Johnson et al., 2012a).

In this vein, many studies that demonstrate outcomes of construal level represent a broad predictor predicting narrow outcomes which are often theoretically more related to one of the four dimensions of psychological distance than to construal level broadly. For example, Liberman et al. (2012) found a relationship between induced spatial distance and creativity. To the extent that being able to think of novel, fantastical ideas is an aspect of creative performance, it is possible that hypothetical distance may be more strongly related to creativity, but at present there is not an established way to measure hypothetical distance independently.

A multidimensional measure would also advance our understanding of construal level as an individual difference. For example, the personality trait Agreeableness may be unrelated to one's construal level broadly, but may be highly related to one's typical sense of social distance, and thereby to one's typical construal level of people. At the moment, we have no available measure with which to capture the social facet of psychological distance in isolation.

Opportunity #2: Longitudinal Measurement

The robustness of construal level as an individual difference is largely unknown by modern standards, as research on construal level uses a single administration measure to infer stability in a construct which should fluctuate wildly moment-to-moment. The modern approach to establishing individual differences, pioneered by Fleeson and Jayawickreme (2015), expects to observe a pattern of stability emerging over many observations. Our understanding of construal

level's role as an individual difference could be further extended by better understanding the extent to which construal level exhibits meaningful stability within-person.

Currently, some studies theorize construal level as a stable individual difference, while others consider it as a cognitive state that fluctuates often. As with most individual differences in psychology, the 'true' answer is probably that it is both. Fleeson and Jayawickreme's (2015) Whole Trait Theory proposes that individual differences should be established by finding evidence of stability within a pattern of fluctuation. According to this approach, we should collect an entire distribution of scores on a construal level scale over time *within*-person, and then show that, for example, the means of these distributions differ significantly between people. This approach has not yet been applied to construal level.

We know very little about how much construal level fluctuates (or is stable) within people over time. This hinders us from being able to assertively answer basic questions like "How robust is construal level as an individual difference?" as well as more intricate questions like "Might some people vary more than others in their construal level, and are their work-related consequences to that?" It is possible that important outcomes, like overall job performance, depend less on whether one is typically high or low construal, and more on one's ability to switch between the two (that is, the variability of one's construal level).

Goals of the Present Study

Construal level is a highly predictive and useful construct, but future research is restrained by the one-dimensional measurement instrument and single-administration measurement strategy that we have been employing thus far. Creating a new measure capable of capturing the full dimensions of psychological distance that inform construal level, and using

that measure to help uncover a more complete picture of individual differences in construal level could move construal research forward in new directions.

This paper aimed to advance construal level in two overarching studies: In the first, I developed and validated a new measure of construal level designed to capture the underlying four dimensions of psychological distance independently. Second, I employed this measure as well as the standard BIF in a repeated-measures study of construal level. In line with Fleeson and Jayawickreme's (2015) recommendations, this repeated-measures study assessed individuals' construal level multiple times over the course of several days, creating a distribution of construal level scores. These within-person distributions of construal level scores are used to predict construal-related work outcomes between-person. Average construal level was tested to predict between-person differences in creativity, detail orientation, organizational citizenship behaviors, visioning, task urgency, and preference for remote work. Total variability in construal level (construal flux) was tested for its ability to predict overall job performance and innovation.

These studies aimed to make three contributions to the literature on construal level: First, to create a new measure of construal level that could enable researchers to include more precise manipulation checks of construal level in their studies, and also ask new questions about how construal level operates that are difficult to investigate with current measures. Second, testing the relationship of average construal level with outcomes (versus single-assessment construal level) could advance our understanding of construal level's usefulness as an individual difference, and inform all future studies of construal level as an individual difference. Finally, demonstrating whether fluctuations in construal level can predict overall job performance and innovation could help cement the importance of managing construal level successfully (versus focusing merely on the benefits of either high or low construal).

Literature Review

"Ye see not your own ease. Ye can not see the wood for trees."
—John Heywood, 1546 CE

Humans have an innate tendency to shift their perspective from zooming-in on concrete details to zooming-out on abstract, essential characteristics. Trope and Liberman (2010) labeled this tendency *construal level*. In lay terms, at a low construal level, we focus on the trees; at a high construal level, we focus on the forest. An abstract construal level brings to mind the qualities of the target that are stable, superordinate, and generalized (Trope & Liberman, 2010). A concrete construal level brings to mind the qualities of the target that are changing, secondary, and context-sensitive (Trope & Liberman, 2010).

The processing frameshift from abstract to concrete construal is not random; it is predictable. Trope and Liberman (2010) identified psychological distance as the underlying trigger that determines *when* humans shift construal levels. That is, construal level shifts as a function of shifts in psychological distance.

A target is psychologically close or distant when one perceives it as part of (or removed from) their current experience of reality (Liberman et al., 2007). Psychologically close targets (e.g., one's hometown) are processed through a lower-level (concrete) construal level. Psychologically distant targets (e.g., a foreign country one has never visited) are processed at an abstract, high construal level. Trope and Liberman (2010) proposed four dimensions along which psychological distance can shift: temporal distance, spatial distance, social distance, and hypotheticality.

The Four Dimensions of Psychological Distance

In the following section, I will describe each dimension of psychological distance that determines construal level. Each of these represent different routes to the same end: increasing

construal level towards more abstract processing. These were central components of the measure I developed in Studies 1 and 2.

Temporal Distance

Temporal distance is the distance in time. Targets we perceive as existing in the past or future are psychologically distant and perceived through an abstract construal level. Targets we perceive as existing in the present (as in, part of our current experience of reality) are perceived through a concrete construal level (Trope & Liberman, 2010). The farther away in time a target feels, the more abstractly it is construed, and the closer the more concrete (Trope & Liberman, 2003).

Spatial Distance

Targets that are physically distant from oneself tend to be psychologically distant as well. For example, a city within a 15-minute drive is objectively closer and also *feels* closer than a city located across an ocean on another continent. Similarly, a coworker who moves from a neighboring cubicle to an office on another floor may also feel more psychologically distant, and thus be seen more abstractly than a coworker who remains seated close by.

Social Distance

The degree of social distance is determined by the amount of similarity to oneself (Kalkstein et al., 2016). Individuals that one feels a high degree of similarity to are perceived as psychologically close. This closeness draws focus to their concrete, low-construal characteristics such as daily moods and situational factors pressing on their behavior (Rim et al., 2009). Individuals that one perceives as highly dissimilar from oneself are perceived as psychologically distant, which brings into focus their abstract, high-construal characteristics such as permanent traits and dispositions (including stereotypes). If one is a computer programmer whose desk is

located equidistant between a fellow programmer seated on the left and a salesperson on the right, then that programmer likely feels much more psychologically close to their fellow programmer, despite the salesperson being equivalent in spatial distance.

Hypotheticality

A coworker one has met, a place one has visited, a past or present one has lived or is living through—all are concrete in the sense that they have objective and certain qualities. In this way, that which one experiences directly is typically more psychologically close (and thereby viewed at a lower, more concrete construal level) than that which one must imagine. Hypothetical targets — from a new coworker one has yet to meet to a place one has never visited to a fantasy world that will never exist — are comparatively psychologically distant, and thus they tend to be viewed through an abstract construal level.

History of Construal Level Theory

Trope and Liberman's (2010) Construal Level Theory of Psychological Distance integrates several preexisting, independent streams of research on abstract and concrete processing. Moeser (1974) observed that participants were better able to notice changes in concrete-worded sentences versus abstractly worded sentences. Mervis and Rosch (1981) found that the process of abstracting a concept involves creatively 'boiling it down' to its essential, superordinate qualities which can then be observed across examples of that concept.

Independently of the above research, Vallacher and Wegner (1987, 1989) observed that people mentally frame their actions in either abstract or concrete terms. For example, some people think of the act of reading in concrete terms, as "following lines of text" while others tend to think of it more abstractly as "gaining knowledge." Vallacher and Wegner (1985, 1989) also observed that these differences in the abstract or concrete framing of actions seemed to hold

across types of actions and even across time, with the same participants exhibiting a tendency towards more concrete or abstract interpretations across two studies a week apart.

Finally, Liberman and Trope (1998) introduced the precursor to modern Construal Level Theory in their Temporal Construal Theory (TCT). Temporal Construal Theory showed in a series of studies that distant future events tended to be processed for their abstract qualities, whereas present and near-future events tended to be processed for their concrete qualities. In this, Temporal Construal Theory was essentially the investigation of *one* of the four dimensions of psychological distance that would eventually comprise modern Construal Level Theory.

In Construal Level Theory, Trope and Liberman (2010) expanded upon what they learned through Temporal Construal to introduce the notion of psychological distance, integrating Temporal Construal as one of four dimensions of psychological distance driving construal level. When Trope and Liberman (2010) introduced modern Construal level and the four dimensions of psychological distance that drive it, they also described the cognitive consequences associated with abstract and concrete construal level processing.

Low construal thinking calls to mind anything else that is also concrete (e.g., situational characteristics, secondary details), whereas high construal thinking brings to mind anything else that is also abstract (e.g., values, traits, goals). By manipulating construal level through psychological distance, we can trigger all of the abstract or concrete associations, attentional foci, and subsequent behaviors related to that construal level. A shifted construal level can drastically affect how we perceive ourselves and others, and what is attended to and remembered (Armor & Sackett, 2006; Eyal & Epley, 2010; Rim et al., 2009).

Workplace Outcomes of Construal Level

Abstract and concrete construal levels have each been shown to benefit different facets of work performance. Interestingly, abstract and concrete construal states are somewhat mutually exclusive (see Christoff et al., 2009, who found that abstract and concrete construal states activate different regions of the brain). Perhaps due to this mutual exclusivity, concrete construal's strengths often imply weaknesses of an abstract construal level, and vice-versa. For example, a person in an abstract construal state may be good at planning for the far future, but bad at planning for the immediate future (White, 2015). In a low construal state, the strengths and weaknesses would reverse: one could plan for today, but not tomorrow. Many studies have demonstrated this 'tradeoff' effect of construal level by testing two opposing outcomes. For example, Wakslak et al. (2006) found that high construal states were better at focusing on ends (goals), but worse at focusing on means (how to achieve that goal), while low construal states were better at focusing on means, but worse at focusing on ends.

Given these tradeoffs, it is important to note that there is no overall 'good' construal level. Abstract and concrete processing frames are both essential functions of cognition. It is more important, for optimal functioning, to match the right construal level to the right task or context. Vallacher and Wegner's (1989) Action Identification Theory proposed that when performing a task, the 'optimal' construal was generally the most abstract construal possible to still complete the task effectively, given its level of familiarity. That is, to perform an unfamiliar task well, people must be able to lower their construal level effectively. To perform a familiar task efficiently, one should remain at an abstract construal level (i.e., without overthinking it). Any deviation from this — thinking too abstractly while performing an unfamiliar task or too concretely during a familiar one — will result in performing the action less efficiently according

to Vallacher and Wegner (1989). One possible explanation for this is that considering too many procedural details on a familiar task acts as an additional cognitive burden that reduces task performance, while failing to consider procedural details on a novel task generates error (Thompson et al., 2009; Vallacher & Wegner, 1989).

Aside from task familiarity, the ideal construal level for a task also depends on the type of task. For example, the ideal construal level to adopt when communicating depends on who one is communicating with and to what end (Berson et al., 2015; Eyal & Epley, 2010). When trying to motivate strangers, an abstract construal level is more effective (Berson et al., 2015). When trying to motivate familiar others, a concrete construal level is more effective (Berson et al., 2015). When trying to establish trust, using concrete (low construal) language is typically more effective, although it is possible that abstract language may have a role in establishing interpersonal trust when used to disclose personal, abstract qualities of the self (Wakslak & Joshi, 2020).

In the following sections, I will enumerate the key characteristics of high and then low construal levels. To reiterate, there is no 'best' construal level overall, and each has its trade-offs. It should become apparent from the following sections that high and low construal levels both bring distinct advantages and are necessary for healthy human functioning. Conversely, each construal level brings distinct shortcomings that the other fills.

Key Outcomes of High Construal Level

When viewing a person, place, object, or other target at an abstract, 'high' construal level, people focus on the superordinate, stable characteristics of that target (Trope & Liberman, 2000). This abstract processing frame brings to mind abstract qualities such as the meaning, purpose, and desirability of a target (Trope & Liberman, 2000). This abstract-orientation can

have positive consequences, like a greater emphasis on ethical, value-based decisions, but also negative consequences like missing necessary details (Armor & Sackett, 2006; Wetherell, 2015).

Greater Focus on Goals and Intrinsic Motivation. In a high construal state, the end is more salient than the means. People in a high construal frame are quicker to attend to goal-related stimuli and keep goals in mind, even during conflict (Belayachi & Van der Linden, 2017; Yip-Bannicq, 2018). They attend more readily to broad goals (e.g., finish my Ph.D.) over short-term goals (e.g., finish this sentence), and may even feel less engaged towards concrete goals (Janke & Dickhäuser, 2019; Labroo & Patrick, 2008). This extends to how people view others as well. When viewing others through a high construal frame, we focus on *their* abstract goals; who they are, and what they are trying to do. Finally, in a high-construal state, individuals tend to be more motivated by intrinsic, psychological rewards (e.g., meaning) over more tangible extrinsic rewards, by broader values over situational pressures, and by approach-related goals over avoidance goals (Eyal et al., 2009; Nan, 2007; Pilarska, 2020).

Creativity. High construal states seem to facilitate creative performance. Liberman et al. (2012) found that raising construal level through a spatial distance manipulation resulted in increased creative performance (both creative fluency and rated originality). In a similar finding, Förster et al. (2004) found that increasing construal level through a temporal distance manipulation also increased insight and creative cognition.

One potential explanation for these findings is the relationship between high construal states and the brain's Default Mode Network (Baetens et al., 2013). In a study of construal level from neuroscience, Baetens et al. (2013) presented evidence that abstract, high construal states activate different areas of the brain than concrete, low construal states. In particular, high construal states activate an area of the brain called the dorsal-medial prefrontal cortex (dmPFC).

The high-construal dmPFC area is located within the brain's Default Mode Network (DFN), which has been linked to creative performance (Godwin et al., 2017).

Disadvantages of High Construal Level. A high construal state helps people see patterns, draw inductive insight, perform better in creative tasks, consider their values before making decisions, and stay focused on their goals (Eyal et al., 2009; Liberman et al., 2012; Trope & Liberman, 2010). It is a crucial process for us to be able to 'zoom out' and consider the big picture. However, over-emphasizing an abstract construal to the exclusion of concrete details can have negative consequences as well.

In a high construal state, people can focus on the abstract characteristics of a target so much that they may gloss over its feasibility, function, and contextual features (Armor & Sackett, 2006; Badalà et al., 2008; Trope & Liberman, 2010). Missing (or rather, not focusing on) secondary details may result in over-confidence about the ease of achieving goals, even a sense of ease in life overall. People who more typically held an abstract construal level rated their lives as easier than their low-construal counterparts (Vallacher & Wegner, 1989). In another study, Armor and Sackett (2006) found that in a high construal state participants were more confident in their predictions about the future, but less accurate. High construal states are also associated with greater risk-taking, which may be related to the underestimation of difficulty and obstacles that can occur at higher construals (Lermer et al., 2015; Vallacher & Wegner, 1989).

Key Outcomes of Low Construal Level

A concrete, "low" construal level can help people execute the visions and achieve the goals imagined in a high construal state (Belayachi 2017; Fujita et al., 2006b; Vallacher & Wegner, 1989; Weisenfeld et al., 2017). At a low construal level, people better assess *how* something can be accomplished (versus why), and are more engaged in concrete, immediate

goals (Labroo & Patrick, 2008). They see more obstacles and factors to consider and make more accurate predictions about the future (Armor & Sackett, 2006; Nussbaum et al., 2003; White, 2015).

Attention to Detail. A low construal level is, somewhat literally, attention to detail (Trope & Liberman, 2010). Concrete construal states are associated with paying attention to subordinate, secondary details over broader characteristics (Trope & Liberman, 2010). In a low construal state, we more quickly notice environmental change, and people's minute moods and expressions (Badalà et al., 2008; Wakslak et al., 2006). The link between low construal and detail orientation is bi-directional. Reducing the amount of detail in one's environment, such as by turning off the lights or removing color from an image, has been shown to induce a higher construal level (Lee et al., 2014; Steidle et al., 2011). When detail is added, such as by turning on the lights or adding color to a grayscale image, a lower construal level is induced (Lee et al., 2014; Steidle et al., 2011).

Situational Awareness. When people operate at a low construal level, they focus on the immediate, contextual details that comprise or surround a target (Badalà et al., 2008; Trope & Liberman, 2000). People operating at a low construal level give greater weight to situational considerations over broader goals (Eyal et al., 2009), and see differentiators over unifiers (Wilson et al., 2013). This can be particularly adaptive when viewing other people. In a low construal frame, people focus on the concrete actions other people are currently performing, and how they are unique and special (Genschow et al., 2019; Wilson et al., 2013). In this way, low-construal frames help us more quickly notice people's immediate feelings and the situational pressures affecting their behavior, helping us overcome the Fundamental Attribution Error of

ascribing temporary behaviors to stable traits (Badalà et al., 2008). In a low construal frame, we see other people as unique individuals apart from any group membership (Badalà et al., 2008).

Immediate Goals. People in a low construal state attend more quickly to concrete goals than to abstract goals (Belayachi & Van der Linden, 2017; Kim et al., 2018; Labroo & Patrick, 2008). We also prefer rewards that are extrinsic, tangible, reflect the pressures of the immediate situation, and avoid threats (Belayachi & Van der Linden, 2017; Kim et al., 2018; Labroo & Patrick, 2008).

Disadvantages of Low Construal Level. In a low construal state, we process information by absorbing bottom-up details and are less selective in the information we process, which can lead to being overloaded and 'lost in the nuance' (Vallacher & Selz, 1991). Similarly, some research suggests that people who more typically operate from a low construal processing frame may be so overwhelmed by the obstacles they perceive as necessary to completing a given goal, that they find tasks and life itself more difficult than their high-construal counterparts (Vallacher & Wegner, 1989). Even though our predictions about the future are more accurate in a concrete construal state, that same concrete state makes us feel less confident in them (Nussbaum et al., 2003).

Summary of High and Low Construal Levels. One's construal level is the level of processing (from low-level/concrete to high-level/abstract) through which one perceives a target (e.g., person, place, event, object, or idea). Whether one perceives a target through a high or low construal processing frame is determined by how psychologically distant or close that target feels to oneself, with more psychologically distant targets being perceived through a high construal level, and more psychologically proximal targets perceived through a low construal level. Construal level and psychological distance are inexorably bound, such that construal level is a

function of psychological distance. Psychological distance is divided into four dimensions: objects can feel close or far in time (temporal distance), space (spatial distance), personal similarity (social distance), and/or tangibility (hypotheticality distance).

By priming a near or far psychological distance on one or more of the above dimensions, and then measuring outcomes, existing literature has identified a myriad of work-related outcomes of construal level. These identified outcomes of construal level cross many sub-areas of research, from communication to motivation and leadership (Nan, 2007; Stephan et al., 2010). Construal level has highly diverse outcomes, with implications for nearly every focal area of organizational psychology (see Wiesenfeld et al., 2017, for a review).

Opportunities to Deepen Our Understanding

There are at least two areas where research on construal level is hindered. First, the most popular measure of construal level, the Behavioral Identification Form, is broadly focused and does not capture the narrow facets of psychological distance that dictate construal level. Second, there is ambiguity around the extent to which construal level exhibits consistent patterns of stability and fluctuation within-person, and what consequences those patterns might have on outcomes. Addressing these two gaps in the literature could give construal researchers a more flexible way to test construal level (in the former), and a much clearer picture of how construal level itself operates (in the latter).

Opportunity #1: Create a Higher-Resolution Alternative to the BIF

Construal level already demonstrates theoretical robustness and the power to predict a wide range of valuable outcomes. However, right now most of the literature rests on a single measurement instrument: Vallacher and Wegner's (1989) Behavior Identification Form (BIF). The BIF predates modern construal level theory, but was so effective at measuring a highly-

analogous construct (Action Identification) that it was adopted as the de-facto standard measure of construal level as well.

The BIF is a 25-item, forced-choice measurement scale consisting of a series of actions taking place in disparate situations (e.g., voting, ringing a doorbell, joining the army). For each action, the test-takers choose how they would likely interpret that action, given two possible choices: one more abstract (e.g., influencing the election), one more concrete (e.g., marking a ballot). The sum score is calculated, with more abstract answers overall indicating a more abstract (and therefore high-construal) processing frame.

Advantages of the BIF. The BIF is a useful, well-designed measure of construal level broadly. It demonstrates good alpha reliability estimates ranging from .74-.85 and showed test-retest reliability of r=.91 in Vallacher and Wegner's (1989) original study introducing it (Rahimi et al., 2016; Sweeney & Freitas, 2018). Further, Rahimi et al. (2016) found that a single latent factor can be extracted from the BIF items, suggesting that it is measuring a single common construct (presumably, construal level). Finally, the BIF regularly responds to manipulations of construal level in a manner consistent with theory, suggesting that it has good construct validity as well (Labroo & Patrick, 2008; Liberman et al., 2012; Wakslak et al., 2006). Overall, the BIF has proven itself an incredibly useful and generative measure for studying construal level. However, it lacks critical aspects of modern construal level theory that have been introduced in the years since its invention. As such, studies of construal level that employ the BIF are also limited in how richly they can capture construal level.

Limitations of the BIF. The major limitation of the BIF is that it is unidimensional. Construal level is now typically studied in terms of the four dimensions of psychological distance that drive it, but the primary measure of construal level, the BIF, does not assess these.

Thus, researchers are often measuring a multi-faceted outcome with a single-faceted outcome measure.

The BIF is still appropriate for many studies where a low-resolution tool is sufficient and higher resolution is not needed. For example, where there is no manipulation of psychological distance, or where construal level is treated as a broad individual difference, the BIF may be an adequate measure. As a prototypical example, Vallacher and Wegner's (1987, 1989) original series of studies measured participants' overall tendency towards abstract or concrete processing, and related that to outcomes. Kanten (2011) followed a similar approach by measuring the impact of overall construal level on perceived task duration. However, there are many research questions where a higher-resolution measure is needed — when it would be appropriate and helpful to be able to measure the dimensions of psychological distance independently.

Benefits of a Multi-Dimensional Measure. A higher-resolution measure could assist in creating better experimental manipulation checks. By definition, any experiment that manipulates construal level must do so by manipulating one or more of the dimensions of psychological distance. Using the BIF to verify the success of the manipulation is, in some respects, using a broad measure to verify a narrow manipulation. To fully adhere to the compatibility principle, predictors and outcomes should be more closely matched in scope (Ajzen & Fishbein, 1977; Johnson et al., 2012a).

Secondly, a higher-resolution measure that captures the four dimensions of psychological distance could also help researchers study the relationships between dimensions of psychological distance. Finally, a higher-resolution measure could make certain valuable research designs and questions more tractable than they are currently with the BIF. In the following sections, I will detail each of these areas where a higher-resolution measure would offer unique benefits.

Better Manipulation Checks. Many studies of construal level focus on a particular dimension of psychological distance, either explicitly or implicitly. In some studies, a somewhat-arbitrary dimension of psychological distance is manipulated as a means of pushing participants' overall construal level towards more abstract or concrete processing. In others, a dimension of psychological distance is chosen for manipulation based on its relevance to the outcomes of interest in a particular study. In both these cases, researchers do not have a standard measure for precisely measuring the dimension of psychological distance they chose to manipulate.

Manipulations of different dimensions of psychological distance are common. For example, Theodorakis and Painesis (2018) manipulated two dimensions of psychological distance: one manipulation targeting social distance, and the other targeting spatial distance, because they were interested specifically in whether these different dimensions might affect outcomes. Fujita et al. (2006a) manipulated social distance to help develop a modified version of the BIF with items focused more narrowly on actions related to choosing an apartment. In both of these cases, best practices in research methods dictate that manipulation checks be used to verify that a manipulation is successful prior to drawing an inference about causality.

This is especially important when there are third variables potentially contaminating the manipulation. For example, in Fujita et al. (2006a) the authors recognized that familiarity with the city used in their spatial distance manipulation (NYC) could introduce unwanted psychological closeness (in the hypotheticality dimension) that could weaken their attempt to raise construal level through spatial distance. To check for this, Fujita et al. (2006a) created their own, in-house manipulation check of hypotheticality distance, in the form of checking familiarity with the target location (New York City). However, given that the study involved choosing an

apartment for a friend (versus oneself), there may have also been an unwanted and tacit manipulation of social distance occurring as well.

In any study of construal level that manipulates a dimension of psychological distance, the ideal manipulation check is a measure of that dimension of psychological distance directly. Also, given cases like Fujita et al. (2006a), where multiple countervailing dimensions might be at play, an ideal measure would capture independently every dimension, so that researchers could both confirm the effectiveness of their intended psychological distance manipulation, and detect any countervailing forces that may be interfering with their expected results.

Assessing Interactions Between Dimensions. There is some evidence of interaction effects between the four dimensions of psychological distance that inform construal level, which could confound studies and lead to confusing results (Maglio et al., 2013). Fiedler et al. (2012) showed in a series of studies that the dimensions of psychological distance are uniformly highly intercorrelated when participants are asked to 'fill in the blank' about an unknown dimension of distance (for example, given that something is far away in space, it is likely to feel far away in time as well). This is consistent with Bar-Anan et al.'s (2007) earlier findings that dimensions tend to hang together implicitly (e.g., "A long time ago, in a galaxy far away."). However, Spence et al. (2012) found that people can rate their perceived psychological distance towards a given target (in their study, towards the impacts of climate change) differently on each dimension, such that correlations between dimensions are small. Spence et al. (2012) noted explicitly that their findings point against any notions of psychological distance being unidimensional.

Finally, Maglio et al. (2013) found evidence for a contrast effect in the different dimensions, such that perceiving something as far/near on one dimension blunts people's ability

to perceive differences in distance on the other dimensions (e.g., If two targets are both far away in time, one loses the ability to precisely differentiate how far apart they are in likelihood). Maximizing the potency of manipulations of construal level may require both a multi-dimensional prime as well as a check to ensure that no dimensions are having a confounding effect. In this example and those above, researchers created their own, study-idiosyncratic assessments of the different psychological distance dimensions. The existence of a standardized, already-available measure of the psychological distance dimensions could have saved these researchers some time, and also made their results more comparable and generalizable.

Answering New Research Questions. In addition to helping researchers ask more effectively the questions they are already asking about construal level, a multi-dimensional measure of construal level would also create opportunities for brand-new avenues of research that are difficult to pursue with the BIF alone. Especially, a dimensional measure of construal level could help us investigate antecedents of individual differences in construal level. For example, it could be possible for people who are higher in the personality trait of Agreeableness to feel generally closer to other people (i.e., lower social distance), and thus have a lower construal level of people, but have a high overall construal level of other targets.

This kind of target-sensitive construal shift has already been shown in studies on construal level and expertise. People generally respond to a target topic they are an expert in at a higher construal than a subject in which they struggle (Vallacher & Wegner, 1989). As a second example, age has been positively associated with individual differences in construal level, such that older people tend to score higher on the BIF than younger people (Reich, 2016). Given the nature of construal level, we know that wherever there is high construal, there is a shift in

psychological distance. However, we do not know what older people feel more distant *from* (although one would expect a greater sense of temporal distance).

Target-sensitive differences in construal level are difficult to test with the BIF alone. Using only the current approach, research would need to design a separate BIF-style measure for each target they want to study. However, it could be straightforward to test some of these target-specific sensitivities with a dimensional measure of construal level. At the least, a dimensional measure could capture categories or domains of target-sensitivity, with researchers perhaps then extending measure precision further into any one of those domains.

Alternatives to the BIF. Researchers have made some attempts to work around the limitations of the BIF by introducing alternatives to it. Typically, these alternative measures are driven by the local needs of a particular study or context. Especially, researchers may retain the basic approach of the BIF, but change the theme of the items.

The Work-Based Construal Level Scale. Reyt and Wiesenfeld (2014) created the Work-Based Construal Level Scale (WBCS). Like the original BIF, the Work Based Construal Level scale focuses on the abstract or concrete construal of actions, but changes the focus from actions across many domains to actions specifically occurring at work. For example, one item is "preparing a report" with the possible interpretations of "filling in a form" and "keeping people updated".

Structurally, the WBCS also employs a novel modification of the BIF's structure, by placing items on a semantic differential scale. Rather than presenting a binary choice for each scale item (e.g., asking participants to choose either the fully-abstract or fully-concrete interpretation), it places a continuous scale between the concrete and abstract interpretations. One is able to choose the concrete interpretation, or the abstract interpretation, or any of 3 other

points in between the two. In this way, it allows for a more continuous, finer-resolution assessment of construal level than the original BIF. Semantic differential scales like this have several other advantages. They have been found to be easier for lay audiences to understand (versus forced-choice), they encourage the test taker to consider more carefully the underlying dimension behind the question when answering, and they are thought to be less susceptible to social desirability bias (Al-Hindawe, 1996; Friborg et al., 2006).

The Work Construal Level Scale. Venus et al.'s (2019) 3-item Work Construal Scale (WCS) is another, more modern alternative to the BIF. In their study of leadership and construal level, Venus et al. (2019) created the WCS to measure daily construal level in leaders. They were concerned that the original BIF would be too long and too detached from work-related issues to be useful. Uniquely, the WCS is a from-scratch, Likert-style measure of construal level that does not resemble the BIF in structure. It attempts explicitly to be more consistent with modern construal level theory than the BIF by building around Trope and Liberman's (2010) definition of construal level. Its three items are:

1. At this moment I am focused on the big picture rather than on details.
2. At this moment I am focused on the general meaning or overall effect of my work.
3. At this moment I care more about the central characteristics of my actions rather than specifics.

Venus et al. (2019) also employed a Likert format for the test. Like Reyt and Wiesenfeld's (2014) WBCL, this allows for more continuous assessment of construal level than the BIF. Venus et al.'s (2019) Work Construal Scale was not designed to capture the dimensions of construal level. It represents a measure that is more parsimonious and more theoretically modern than the BIF, but not higher resolution in terms of dimensions of psychological distance.

Summary of Opportunities to Improve Measurement. The BIF is the most popular instrument used to measure construal level, and despite being detached theoretically from modern construal level theory, it has proven itself well-suited to capturing construal level broadly when a finer resolution is not needed. But because it does not capture the individual dimensions of psychological distance that create a construal level, it is too broad for many study designs and research questions. The literature is constrained by the absence of a more flexible, multi-dimensional measure of construal level. Creating a new, dimensional measure of construal level would enable more powerful manipulation checks and all-new research streams. However, even if there existed a multi-dimensional measure of construal level, there remains a second major limitation in the construal level literature: the way construal measures are typically administered.

Opportunity #2: Multi-Slice Construal Measurement

Our construal level fluctuates throughout the day as the targets we attend to vary in perceived psychological distance. Everything we think about, we may process at a different level of construal. This variability of construal level contrasts with how construal level is typically measured as an individual difference.

In their paper introducing the BIF, Vallacher and Wegner (1989) proposed that abstract and concrete processing was not a fluctuating cognitive state, but a stable individual difference between people. They proposed that some people, whom they termed "high-level agents" tended to think of their actions in abstract terms, while others termed "low-level agents" tend to think of their actions in concrete terms. In a series of studies using the BIF, Vallacher and Wegner (1989) showed that people who scored higher/lower on the BIF had different outcomes and behaviors,

many of which would be later identified as characteristics of high/low construal level (for example, high scorers tended to focus on the "why" rather than the "how").

To indicate the stability of construal level within-person, Vallacher and Wegner (1989) collected scores on the BIF from the same participants two times, two weeks apart. They obtained a test-retest reliability estimate of .91, suggesting that the BIF measures a stable tendency. This study paved the way for construal level to be studied as an individual difference variable. However, modern construal level is conceptualized as fluctuating constantly. These contrasting interpretations have led to somewhat parallel literatures where the BIF is employed both as a measure of momentary construal level and a measure of stable construal level (or Action Identification, in Vallacher and Wegner's [1989] original terms). We could resolve this tension by determining how much construal level fluctuates within-person.

Unfortunately, Vallacher and Wegner (1989) was one of the few studies to assess participants over more than one time point. Since the BIF was introduced, most studies, whether they are studying construal level as a state or as an individual difference, use a single application of the BIF in their design. In this, the literature is inferring that a single administration of the BIF is sufficient to capture construal level either as an individual difference or as a fluctuating state. This is not in itself a threat to the theoretical consistency of construal level. Even well established individual differences like Costa and McCrae's (1985) Five Factor Model of personality exhibit both fluctuation and stability within individuals over time. The problem is that we do not know *how much* construal level fluctuates or exhibits stability within-person, nor whether there are unique consequences of that stability or fluctuation on outcomes.

Fleeson (2001) recommends that, for any construct that has shown both within-person stability and fluctuation (as construal level has), that it be measured over time as a distribution of

scores for each participant. Then, after collecting a distribution of a person's standings on that construct over time, the average of that distribution can be taken as an indication of their 'trait' standing on the construct. This average standing can then be used to predict meaningful outcomes. Assessing individual differences in this way is argued to produce more valid inferences about the outcomes of trait standings.

Collecting a distribution of momentary standings also creates an opportunity to test useful metrics that single-slice measurement alone cannot provide. For example, beyond a person's average standing on the construct, a distribution can reveal how much they vary on that construct (e.g., the *width* of the distribution). This variability metric can be an important factor in better predicting known outcomes, and can itself predict entirely novel outcomes.

Within-person variability can moderate existing predictor-outcome relationships. Generally, when a construct is less variable (i.e., more stable) within-person, it is more strongly associated with its related outcomes (Debusscher et al., 2016). For example, the relationship between conscientiousness and job performance is stronger when the within-person variability in conscientiousness is lower (Debusscher et al., 2016). Presumably, this suggests that acting conscientiously more frequently increases job performance more than behaving conscientiously only sometimes, even if one is highly conscientious on those infrequent occasions.

Variability can also predict novel outcomes. Beal et al. (2013) found that the amount of variability in affect and emotion over the course of the workday — termed "affective spin" — significantly predicts end-of-day fatigue (with more variability in daily affect predicting more fatigue). Johnson et al. (2012b) assessed daily leader behaviors over a 3-week period and showed that the total variance in transformational leadership behaviors was meaningful in predicting employee's perceptions of leaders. In the case of Johnson et al. (2012b), low variability was

more ‘desirable’ and communicated a more consistent identity to employees. As a final example, behavioral variability (or lack thereof) can serve as an indicator of situational strength, with stronger situations suppressing variability in behavior (Meyer et al., 2010).

There can also be predictive individual differences in variability. Dalal et al. (2020) and Fleeson (2004) both argued that people can exhibit stability in how much they vary. For example, Beal, et al. (2013) found that people high in affective variability were more sensitive to environmental stressors. This allows for variability itself to be studied as an individual difference in between-person designs.

For construal level, variability may be especially important. With other individual difference constructs like personality, trait stability is expected by theory and any observed intra-individual fluctuations were theoretically problematic for some time (Fleeson, 2004). However, with construal level the situation is the reverse: it is expected to vary constantly, but some within-person stability has been observed. In the personality literature, Fleeson and Jayawickreme’s (2015) Whole Trait Theory integrated both state and trait aspects of personality and reframed personality as a pattern of stability within change. In the same way, we need an integrative picture of construal level’s within-person variability.

If the individual differences in construal level remain after being tested using this modern approach, then it could suggest that one’s average construal level predicts many of the same outcomes as a momentary measure of construal level, but with the caveat that high personal variability in construal level could suppress many of those relationships. While observing such stability in construal level would be highly meaningful, so too would discovering that variability in construal level has its own outcomes. For example, switching between construal levels often

during the workday may represent successful navigation of both vision and execution at work, and be reflected in more efficient work performance.

Summary of Literature Review

Construal level theory integrates several narrowly-focused streams of literature on abstract and concrete processing tendencies. It proposes that when we focus our attention on a target, we consider that target as existing on a continuum of psychological distance. Targets feel more psychologically distant when they are perceived as existing in the future or past (temporally distant), physically far from us (spatially distant), dissimilar from us (socially distant), and intangible (hypotheticality distance). Targets feel psychologically close when they are perceived as existing in the present moment, physically near, similar to us, or tangible. Targets that are perceived as psychologically far are perceived at an abstract, high construal level, and targets perceived as psychologically close are perceived at a concrete, low construal level. A high construal level processing frame brings to mind the 'forest' of the target — the target's abstract, stable, essential qualities. A low-construal processing frame focuses the attention on the subordinate, concrete, changing, contextual aspects of the target (Trope & Liberman, 2000).

The first opportunity to aid construal level research lies in creating a higher-resolution measurement instrument. Much of the construal level literature utilizes a measure of abstract and concrete processing called the Behavior Identification Form (Vallacher & Wegner, 1989). The BIF has proven itself a useful indicator of construal level with good psychometric properties and well-replicated construct validity. However, it is a unidimensional, 'low-resolution' measure of construal level that does not capture the modern, multi-dimensionality of construal level theory, which relies on the four dimensions of psychological distance outlined above. The broad scope

of the BIF hinders the precision of manipulation checks in studies of construal level and also precludes researchers from pursuing new, useful avenues of research that require a dimension-sensitive measure.

The second opportunity to aid construal level research is capturing construal level as a distribution of construal levels within-person over time, to test the consequences of individual stability and variability in construal level. Modern best practices suggest framing any individual difference as a pattern of stability over a distribution of states. This within-person distribution, and the useful variability metrics that it can provide, is missing from the construal level literature right now, which relies mostly on single-point assessment.

We know that construal level fluctuates within-person, and we know that it seems (based on scattered results) to exhibit at least some within-person stability, but we need a clearer picture of that fluctuation and stability. We also do not know whether there might be consequential outcomes associated with patterns of fluctuation and/or stability. This limits our understanding of both the nature of construal level and its predictive power. Within-person variability has shown to be a useful predictor for many other constructs and could be especially important for construal level outcomes, given that some have suggested that it is the efficient shifting of construal level that is as much or more important for work outcomes than either high or low construal separately.

Construal level research needs a higher-resolution, multi-dimensional measure to help check dimension-based manipulations and to ask new questions. It also needs a better understanding of how construal level behaves within-person over time and the consequences of those within-person patterns. In a series of studies, I attempted to address both of these by developing a new, multi-dimensional measure of construal level, and using it (as well as the BIF)

in a repeated measures study of construal level that captured a distribution of within-person construal levels and used them to predict novel between-person outcomes.

Study 1: Measure Development

Introduction

In my first study, I developed a new measure of psychological distance called the Psychological Distance Scale (PSYDIS). Its primary purpose was to capture the four dimensions of psychological distance that underlie shifts in construal level. This new measure drew different strengths from two recent construal measures discussed above: Reyt and Wiesenfeld's (2014) Work-Based Construal Scale and Venus et al.'s (2019) 3-Item Work Construal Scale.

Like Venus et al.'s (2019) 3-item Work Construal scale, it is rooted in modern construal level theory. That is, the PSYDIS was designed to measure the four identified dimensions of psychological distance that create construal level (social, physical, temporal, and hypotheticality), consistent with Trope and Liberman's (2010) theory. In contrast, Vallacher and Wegner's (1989) BIF measures construal level only through the abstract or concrete processing of hypothetical actions (not through broad psychological distance dimensions).

Like Reyt and Wiesenfeld's (2014) Work-Based Construal Scale, the PSYDIS employed a Semantic Differential Scale (SDS) format, rather than a forced-choice measure. Semantic Differential Scales are somewhat of a hybrid between Likert scales and forced-choice scales. Like a forced-choice measure, they present an item stem (e.g., "Regarding people, I tend to feel…") and then two choices (e.g., "Similar to them" and "Different from them"). However, instead of being forced to choose only between those two fixed answers, as in a forced-choice measure such as the BIF, the test-taker is able to place their response on a continuum from one choice to the other, more akin to a Likert scale.

Advantages of Semantic Differential Scale Design

Semantic Differential Scales have several advantages. First, Semantic Differential Scales yield clearer factor structures than forced-choice measures and Likert scales (Friborg et al., 2006; Johnson, Wood & Blinkhorn, 1988). This was an especially important consideration, given that my new scale aimed to capture the four dimensions of construal level as four independent factors. Second, Semantic Differential Scales have shown to be easily used and understood by lay-audiences (Al-Hindawe, 1996).

Dimensional Structure and Scoring

The compatibility principle, emphasized in Ajzen and Fishbein (1977), holds generally that broad measures should be used for predicting broad outcomes, and narrow measures should be used to predict narrow outcomes. Johnson et al. (2012a) suggest that each dimension of a multi-dimensional scale can act as a narrow measure for predicting a narrow target, while the sum score of the scale can act as a broad measure to predict broad construct targets. This was the purpose of the PSYDIS scale. It was designed to be used flexibly as either a target-specific measure of construal level or using the total score as a broad measure.

Methods

An initial set of 54 draft items (see Appendix W) was written deductively, drawing from construal level theory, and in particular the conceptualization of each dimension of psychological distance (in accordance with the recommendation of Hinkin et al., 1997, to refer to theory for scale development when theory exists). The following definitions of each dimension of psychological distance informed the development of the PSYDIS' items.

Definition of Temporal Distance. Bar-Anan et al. (2006) defined temporal distance as "how much time (past or future) separates between the perceiver's present time and the target" (p. 609).

Definition of Social Distance. Bar-Anan et al. (2006) defined social distance as "how distinct the social target [is] from the perceiver's self" (p. 609).

Definition of Spatial Distance. Trope and Liberman (2010) defined spatial distance as how much physical space the subject perceives between themselves and the target.

Definition of Hypotheticality Distance. Bar-Anan et al. (2006) defined hypotheticality distance as "How likely is the target event to happen, or how close it is to reality, as construed by the perceiver" (p. 609).

SME Card Sorting Task

Prior to more formal validation tests, two subject matter experts (SMEs) were asked to sort (via 'drag and drop' on a computerized survey) each of the generated draft items under one of the four dimensions of psychological distance. The purpose of this 'card sorting' task, recommended in Carpenter (2018), was to help identify problem items that were written in such a way that they could relate to multiple dimensions, and ultimately to create a set of initial items that had the best possible chance of loading independently on the four different factors I hoped to create with the final scale. SMEs were also asked to provide freeform feedback on the content validity of the draft scale items. Both SMEs held PhDs in Organizational Psychology, and had previously conducted research on construal level.

Item Correlations and Exploratory Factor Analysis

Following the card sorting task and initial revisions (outlined in results below), a sample of online participants completed a survey containing a version of the PSYDIS measure items that

were revised in response to results of the SME card sorting task. The Social Distance subscale contained 13 draft items. The Hypotheticality Distance subscale contained 11 draft items. The Physical Distance subscale contained 9 draft items. Finally, the Temporal Distance subscale contained 14 draft items. These item counts are all generally in line with recommendations by Guadagnoli and Velicer (1988) to include between 4-10 draft items per subscale during validation, and in line with Hinkin et al.'s (1997) recommendation of drafting double a final target of 3-6 items per scale.

Sample Characteristics. An initial sample of 516 participants was collected from Amazon's Mechanical Turk service. All participants indicated that they resided in the United States and were employed full-time. Seventy cases were dropped for providing incomplete data (listwise deletion). An additional 158 cases were dropped as repeated (participants taking the survey more than once). In the case of duplicate responders, their chronologically first submission was retained. Of the remaining cases, three participants were dropped for failing the attention check item (see Appendix W), resulting in a final sample of 285 participants. Given that these participants were asked to complete a survey comprised of 47 draft items, this equates to a participant-per-item ratio of 6.06:1 for the full scale. Participants were paid $2.00 to complete the survey, which took an average of 10.05 minutes to complete. This equated to an hourly pay of $12/hour. Note that three outliers were removed from the average completion time calculation, as they seemed to have left the survey tab open at the 'thank you' page without clicking the final submit button, resulting in a logged survey completion time above 100,000 minutes.

Inter-Item Correlations. Based on the recommendation of Hinkin (1998), I performed tests of inter-item correlations on the scale items. The 'rule of thumb' reflected in Hinkin et al.

(1997) is to drop items that intercorrelate less than .40. However, the dimensions of psychological distance were shown in Fiedler, Jung, Wanke, and Alexopoulos (2012) to intercorrelate between .20 and .80, a range that straddles the threshold for dropping items. While it is not yet settled whether and under what conditions the dimensions of psychological distance *should* intercorrelate, the items within a single dimension, at least, should intercorrelate. As such, I applied the .40 intercorrelation threshold to items within each subscale, and dropped or revised items that did not correlate at least .40 with other items for the same distance dimension.

Exploratory Factor Analysis. Exploratory Factor Analysis (EFA) with maximum likelihood estimation was performed to assess the factor structure of the draft scale. Each item's loading (using Oblimin rotation, due to the expected correlation between dimensions) was assessed for both how well it fit with its expected factor, and for how exclusive that fit was (i.e., loaded mostly on a single factor). A Kaiser-Meyer-Olkin (KMO, [1970]) factor adequacy test was performed on the data to test whether the sample size was sufficient for factor analysis. Dasgupta (2021) recommends a obtaining a Measure of Sampling Adequacy (MSA) through this test of at least MSA=0.5 to have some confidence that there is enough data to be factor analyzed. Second, a Bartlett (1951) test was performed to determine whether the obtained correlations were large enough for factor analysis, with a significant p value of < 0.05 representing items that exhibit sufficient correlation to be factor-analyzed.

Parallel analysis was used to detect the number of latent factors, and the older, stricter Kaiser (1960) criterion was applied to exclude factors with an eigenvalue < 1.0. Following this, an exploratory factor analysis was performed to test the fit of the desired 4-factor model. An Oblimin rotation was used in this EFA because previous literature (e.g., Fiedler et al., 2012) suggests that the psychological distance factors should be intercorrelated.

Results

Overall, the initial measure development effort, comprised of item drafting, SME card sorting feedback, and the measure structure study, resulted (after removing items with low factor loading or low inter-item correlation) in a measure with between 3-4 factors, and a full scale alpha of .77 (see below for details). The social, hypotheticality, and temporal distance subscales demonstrated (after dropping poor performing items) acceptable alpha coefficients (alpha = .75, .alpha = .75, and alpha = .81, respectively) and item-total correlations. Item total correlations for the social distance dimension ranged from r =.55 – .70, for the hypotheticality dimension r = .33 – .61, and for the temporal dimension r = .50 – .59. The spatial distance subscale showed a weaker internal structure than the other dimensions (alpha = .53, item-total correlations ranged from r = .27 – .39). However, it did at least load well on its own factor. In the following sections, I will detail the results of each step in the measure development process.

SME Card Sorting Task

Following the card sorting task, subject matter experts indicated that five of the fifty-four 'first draft' items were difficult to understand as written. Three items were sorted into the wrong dimension by both of the SMEs, and eight items were sorted into the wrong dimension by only one SME. In total, five items from the social dimension, three items from the temporal distance dimension, three items from the spatial dimension, and zero items from the hypotheticality dimension were identified as problematic in some way through the SME card sorting exercise.

One SME commented that some items like "It is more enjoyable to think about: People similar to me / People different to me" and "It is more comfortable to think about: People similar to me/different from me" felt redundant. In these cases, the "enjoyable" items were cut (one from each of the four subscales) and the "comfortable" equivalent items were retained, as these were

viewed as having less potentially-confounding emotional valance than the "enjoyable" worded items. Two of the social distance items began with the stem "When I think of a stranger in a far away country…" SME feedback noted it was difficult to decide whether these were social or physical. For these items, the stem was changed to "If I were to meet a stranger…"

The temporal distance item "When I think of the distant future I picture events: That may occur within my lifetime / That will likely occur after I am gone." was incorrectly sorted in to the "hypotheticality" dimension by both SMEs. This item was revised to "When I think of the distant future, I picture events: 1 year from now / 25 years from now." as I thought that this 'temporal scale' item style would imply less imagination/hypotheticality than its original form. The temporal distance item "I feel: Focused on the present moment / Detached from the present moment" was incorrectly sorted in to the hypotheticality dimension by one SME. It was revised to "I feel: Focused on the here and now / Far from the present" to help make it more clearly focused on time. Two similar items (e.g., "I feel very: In the moment / detached from the present moment.") were dropped for redundancy.

The physical distance item "The physical objects around me feel very: Familiar / Unfamiliar" was incorrectly sorted into the social distance dimension by one SME. As such, this and a similar item were dropped from the physical distance dimension. The physical distance item "I feel like my body is positioned: Up close / At a distance" was noted by one SME as difficult to answer, and was revised to be more concrete: "I feel like my face is positioned close to the screen / far from the screen." Although the SME card sorting activity did not identify any problems with any of the hypotheticality distance items, one item was dropped and one was revised, both to reduce redundancy between items.

Two new items were added to the social distance dimension: “I feel like keeping people close / keeping people at a distance” and “If I were to interact with a new person right now, I would focus on: Figuring out their immediate mood / figuring out their general personality.” Three new items were added to the temporal distance dimension: “It is more comfortable to think about: Events in the present/future”, “It is more comfortable to think about: Events in the present / Events in the past”, and “It is more rewarding to think about: Events in the present / Events in the future.” These new items were an attempt to include a target in the item wording (“events”). Finally, one new item was added to the physical distance dimension: “The world feels: Big / Small.”

A total of 33 of the original 54 items were retained as-is (7 from social distance, 9 from temporal distance, 7 from spatial distance, 10 from hypotheticality distance). Eight items were revised (4 for social distance, 2 for temporal distance, 1 for physical distance, and 1 for hypothetical distance). Six new items were added (2 to social distance, 3 to temporal distance, and 1 to physical distance). The final ‘draft 1.5’ PSYDIS scale, going into the measure structure study, included 47 items (13 in social, 11 in hypothetical, 9 in spatial, 14 temporal).

Initial Item Correlations

The first draft full scale of 47 items exhibited a Cronbach’s alpha coefficient of 0.83 and an average inter-item correlation of 0.28. The Social Distance subscale (13 items) initially exhibited a 0.76 coefficient alpha and an average inter-item correlation of 0.39, with 4 items falling below the .40 cutoff item-total correlation. The Hypotheticality Distance subscale (11 items) initially exhibited a coefficient alpha of 0.81 and an average inter-item correlation of 0.49, with all items above the .40 cutoff item-total correlation. The Spatial Distance subscale (9 items) initially exhibited a .40 coefficient alpha and an average inter-item correlation of .16, with 4

items falling below the .40 cutoff item-total correlation. Finally, The Temporal Distance subscale (14 items) exhibited a coefficient alpha of 0.70 and an average inter-item correlation of .32, with 10 items falling below the .40 cutoff item-total correlation. A summary of these statistics can be seen in Table 1

Table 1:
Reliability and Item-Total Correlations of Draft Scales and Scale Items

	Average scale item-total correlation	Scale alpha
	Item-total correlation	Alpha if dropped
Full scale	.28	.83
Social distance	.39	.76
I feel similar to most people / different from most people.	.54	.73
I like to keep people close / at a distance.	.69	.71
If I were to interact with a new person right now, I would focus on figuring out their immediate mood / figuring out their general personality.	.20	.77
I think that people are unique and different / essentially the same.	.08	.78
If I were to interact with my close friend right now, I would focus on their immediate mood / their overall personality.	.12	.78
When I interact with people I focus on their immediate feelings / I focus on their overall characteristics.	.30	.76
I feel close to most people / distant from most people.	.64	.72
If I were to meet a stranger, I would feel close to them / distant from them.	.48	.74
If I were to meet a stranger, I would feel similar to them / different from them.	.50	.74
When I think of my close friend, I feel similar to them / different from them.	.36	.75
It is more comfortable to think about people similar to me / people different from me.	.09	.78
I feel like keeping people close / keeping people at a distance.	.69	.71

Table 1 (cont'd)

If I were to meet a new person, I would assume that I do not have much in common with them / I have a lot in common with them.	.39	.75
Hypotheticality distance	.49	.81
I like thinking about practical, possible things / fantastical things that do not exist.	.63	.78
I like thinking about things that could realistically happen / things that may never happen.	.61	.78
I think possibilities are restricted by practical constraints / anything is possible.	.30	.81
I feel more pragmatic / visionary.	.40	.80
If I were to write a book right now, it would be nonfiction / fiction.	.26	.82
I feel more motivated by tangible rewards / abstract rewards.	.44	.80
I feel grounded in reality / detached from reality.	.43	.80
Most of my thoughts are about things that are likely / about things that are unlikely.	.58	.79
It is more comfortable to think about events that are real / hypothetical.	.61	.78
Thinking about impossible things feels pointless / productive.	.43	.80
It is more comfortable to think about realistic things / fantastic things.	.66	.78
Temporal distance	.32	.70
One year is a long amount of time / a short amount of time.	.21	.70
Think about your short-term future. How far ahead did you think?	.27	.69
Think about your long-term future. How far ahead did you think? 1 Year / More than 25 years.	.36	.68
Think about your recent past. How far back did you think? 1 Day / 1 Year or more.	.27	.68
When I think about the distant future, I picture events. 1 Year from now / 25 Years or more from now.	.35	.68

Table 1 (cont'd)

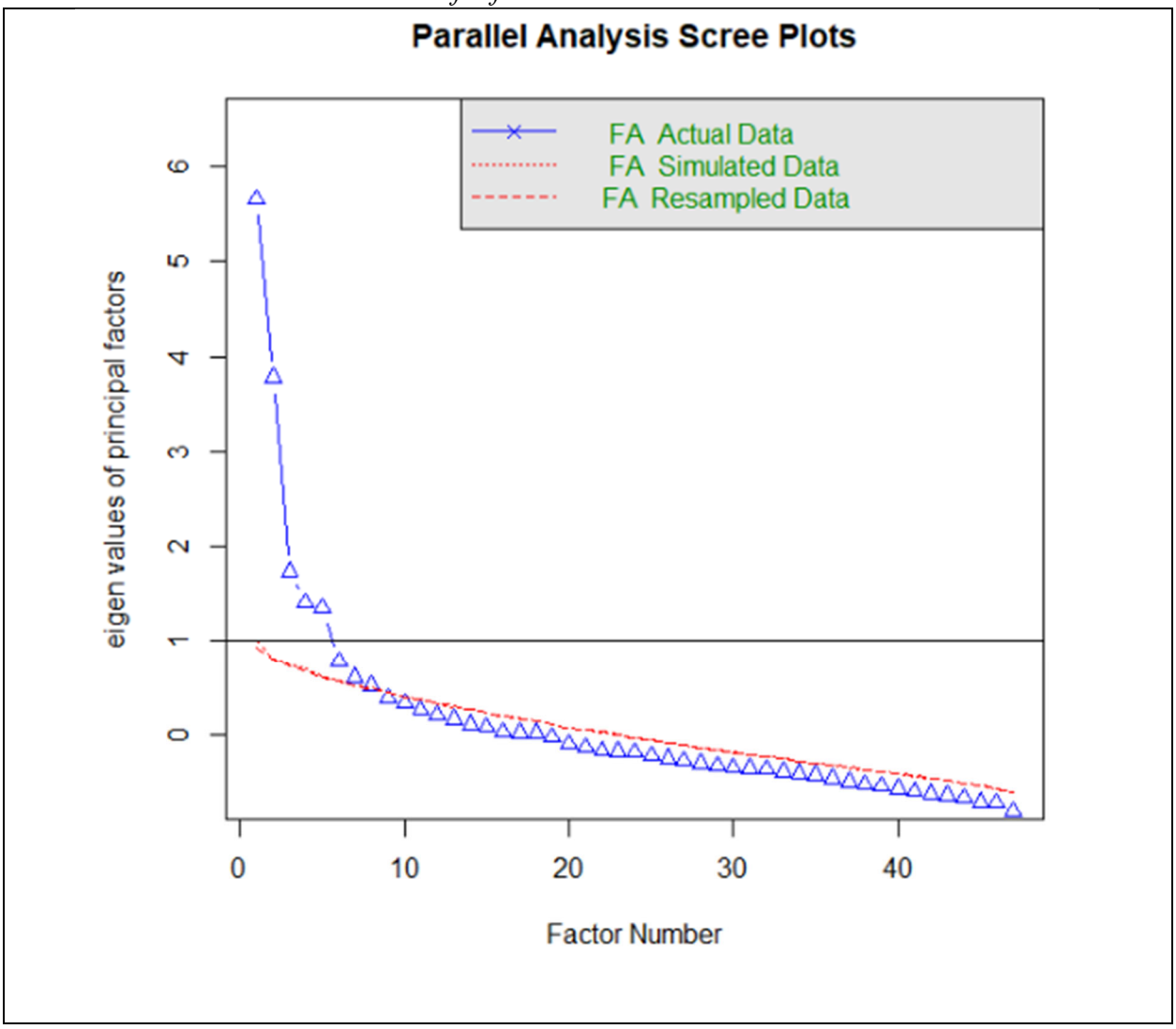
It is more comfortable to think about near-term goals / very distant future goals.	.37	.68
I feel focused on the here and now / far from the present.	.55	.66
I feel focused on what is happening right now / things that are happening at another time.	.54	.66
I perceive time moving by slowly / time moving by quickly.	-.002	.72
My sense of what happened before this moment is clear / vague.	.15	.70
It is more comfortable to think about events in the present / events in the future.	.49	.66
It is more comfortable to think about events in the present / events in the past.	.37	.68
It is more rewarding to think about events in the present / events in the future.	.47	.66
When I think of the distant past, I picture events before my lifetime / within my lifetime.	.11	.72
Spatial distance	.16	.40
I feel like I am positioned in a central location / remote location.	.25	.33
I feel physically close to places that matter to me / physically far away from places that matter to me.	.33	.29
I feel more comfortable with cozy spaces / big, vast spaces.	.30	.30
One mile is a large amount of distance / a small amount of distance.	-.02	.44
My physical surroundings feel cramped / spacious.	-.06	.46
My face is positioned close to the screen / far from the screen.	.16	.37
The world feels big / small.	.16	.37
Most places in the world feel close to me / far away from me.	.02	.43
It is more comfortable to think about places that are close by / places that are far away.	.33	.29

Note. Items in bold were retained in the final scale.

Initial Factor Structure

A Kaiser-Meyer-Olkin factor adequacy test revealed an overall Measure of Sampling Adequacy value of MSA = .77, which is above the recommended .5 minimum cutoff value for sample analysis (Kaiser, 1970). A Bartlett test of sphericity returned a significant p value of 0.00. This indicates that the data exhibited sufficient correlations for factor analysis.

Figure 1:
Scree Plot Shows That the Initial Draft of the PSYDIS Scale Exhibited 4–5 Factors



Parallel analysis suggested a 7-factor structure for the full PSYDIS scale. Using the stricter Kaiser (1960) criterion of retaining only factors with eigenvalues greater than 1.0, a five-

factor structure was suggested. Observing a scree plot (see Figure 1) seemed to suggest between 4-5 factors. Exploratory factor analysis, testing the intended 4-factor structure and using an Oblimin rotation, resulted in an RMSEA = .06, indicating an acceptable but fair factor fit for a 4-factor structure. However, this model only achieved a TLI of .72, indicating a poorer fit (Hu & Bentler, 1999).

Table 2:
Factor Loadings for Initial Draft Items

Social Distance	Social	Temporal	Hypothetical	Physical
I feel similar to most people / different from most people.	**0.52**	0.04	0.1	-0.22
I like to keep people close / at a distance.	**0.89**	0.01	0.01	0.03
If I were to meet a new person, I would assume that I do not have much in common with them / I have a lot in common with them.	0.18	-0.1	-0.09	0.12
I think that people are unique and different / essentially the same.	0.15	0.19	0.06	0.22
If I were to interact with a new person right now, I would focus on figuring out their immediate mood / figuring out their general personality.	0.18	0	0	**0.34**
When I interact with people I focus on their immediate feelings / I focus on their overall characteristics.	**0.37**	-0.17	-0.14	**0.33**
I feel close to most people / distant from most people.	**0.71**	0.11	-0.01	-0.2
If I were to meet a stranger, I would feel close to them / distant from them.	**0.45**	-0.04	0.01	-0.43
If I were to meet a stranger, I would feel similar to them / different from them.	**0.4**	-0.03	0.1	-0.51
When I think of my close friend, I feel similar to them / different from them.	**0.34**	0.23	0.06	0.16
It is more comfortable to think about people similar to me / people different from me.	0.15	0.2	0.03	**0.37**
I feel like keeping people close / keeping people at a distance.	**0.92**	-0.02	-0.01	0.08
If I were to meet a new person, I would assume that I do not have much in common with them / I have a lot in common with them.	**0.34**	-0.1	0.03	-0.45

Table 2 (cont'd)

Temporal Distance	Social	Temporal	Hypothetical	Physical
One year is a long amount of time / a short amount of time.	0.05	0.13	-0.04	-0.04
Think about your short-term future. How far ahead did you think? 1 Day / 6 Months or more.	-0.03	0.16	0.1	0.05
Think about your long-term future. How far ahead did you think? 1 Year / More than 25 years.	0.04	0.24	0.06	0
Think about your recent past. How far back did you think? 1 Day / 1 Year or more.	0.03	0.2	0.04	0.02
When I think about the distant future, I picture events. 1 Year from now / 25 Years or more from now.	0.13	0.18	0.11	0.01
It is more comfortable to think about near-term goals / very distant future goals.	-0.02	**0.5**	-0.02	0.12
I feel focused on the here and now / far from the present.	0.03	**0.79**	-0.07	0.04
I feel focused on what is happening right now / things that are happening at another time.	-0.07	**0.74**	0.1	-0.05
I perceive time moving by slowly / time moving by quickly.	0.13	-0.04	-0.01	-0.08
My sense of what happened before this moment is clear / vague.	0.1	0.26	0.1	-0.02
It is more comfortable to think about events in the present / events in the future.	0	**0.57**	0.02	-0.05
It is more comfortable to think about events in the present / events in the past.	0.04	**0.51**	0.05	-0.08
It is more rewarding to think about events in the present / events in the future.	0.04	**0.5**	-0.04	0.05
When I think of the distant past, I picture events before my lifetime / within my lifetime.	0.08	0.11	0.07	0.11
Hypotheticality distance	Social	Temporal	Hypothetical	Physical
I like thinking about practical, possible things / fantastical things that do not exist.	-0.05	-0.04	**0.78**	-0.06
I like thinking about things that could realistically happen / things that may never happen.	-0.07	0.06	**0.7**	-0.05

Table 2 (cont'd)

I think possibilities are restricted by practical constraints / anything is possible.	-0.11	-0.11	0.23	0.29
I feel more pragmatic / visionary.	-0.02	-0.14	**0.4**	0.28
If I were to write a book right now, it would be nonfiction / fiction.	-0.06	-0.05	**0.36**	-0.1
I feel more motivated by tangible rewards / abstract rewards.	-0.08	0.13	**0.31**	**0.4**
I feel grounded in reality / detached from reality.	0.15	0.09	**0.45**	0.04
Most of my thoughts are about things that are likely / about things that are unlikely.	0.05	0.03	**0.65**	0.01
It is more comfortable to think about events that are real / hypothetical.	0.11	-0.04	**0.73**	0.06
Thinking about impossible things feels pointless / productive.	0.01	0.01	**0.34**	**0.44**
It is more comfortable to think about realistic things / fantastic things.	-0.04	0.07	**0.74**	0
Spatial Distance	Social	Temporal	Hypothetical	Physical
I feel like I am positioned in a central location / remote location.	0.19	0.12	0.17	0.06
I feel physically close to places that matter to me / physically far away from places that matter to me.	0.27	**0.32**	0.11	0.11
I feel more comfortable with cozy spaces / big, vast spaces.	0.08	0.18	0.13	**0.33**
One mile is a large amount of distance / a small amount of distance.	-0.02	0.12	-0.04	-0.12
My physical surroundings feel cramped / spacious.	-0.01	-0.01	-0.15	**0.3**
My face is positioned close to the screen / far from the screen.	0.06	0.04	0.01	0.07
The world feels big / small.	0.18	0.1	0.15	**0.37**
Most places in the world feel close to me / far away from me.	0.12	0.19	0.05	-0.38
It is more comfortable to think about places that are close by / places that are far away.	0.15	0.26	0.19	0.22

Note. Loadings greater than .29 are in bold, as this was the threshold for 'acceptable' loading that informed the scale revisions (explained below). Retained items in bold.

Scale Revisions

Items from the first draft of the PSYDIS were assessed individually for their factor loadings and item-total correlations. For the social, hypothetical, and temporal distance subscales, items that were unable to achieve an item-total correlation (within a subscale) of less than .40 were generally dropped, except for the hypotheticality distance item "I feel more pragmatic/visionary" which exhibited an item total correlation of r = .33 but a strong factor loading. Items with a factor loading less than .299, or that loaded on more than one factors with greater than .299 factor loading, were also dropped. This .299 threshold was recommended by (Buchanan, 2018). For the physical distance scale, no items had both a good factor loading and an item total correlation above .40. As such, the items with the best combined factor loadings and item total correlations were retained. Items that were deemed conceptually redundant were also dropped (one was dropped for redundancy from the social subscale, one from temporal, two from hypothetical, and none from physical). The final 'second draft' scale consists of 16 items (4 for social, 4 for temporal, 5 for hypothetical, and 3 for physical).

Internal Consistency of Revised Scale

In its second draft, the full-scale alpha coefficient decreased from .83 to .77, likely due to increased subscale independence, but the subscale alpha coefficients improved. The alpha coefficient for the social distance subscale was increased from 0.76 to 0.81. The alpha coefficient for the temporal distance subscale was increased from 0.70 to 0.75. The alpha for the physical distance subscale was increased from 0.40 to 0.53. By retaining the best items but eliminating two redundant items deemed less theoretically sound, the alpha for the hypothetical distance subscale was reduced from 0.81 to 0.75. Although this is a lower alpha, it is my view that some of the initial draft scale's alpha value for this subscale was reflecting a high intercorrelation

between near-identical-sounding items. Put simply, this new alpha coefficient for the revised hypotheticality distance subscale may be lower, but in my view it is more accurate.

Item Total Correlations for Revised Scale

The pattern of item total correlations improved in the revised scale, with the subscales improving more dramatically than the full-scale. Following the revisions, the average item-total correlation for the full scale increased from r = .28 to r = .37. Note that the full-scale average item-total correlation was potentially deflated by independence in the subscales, and also by the low item-total correlations of the physical distance scale, which in its revised form demonstrated an average item-total correlation of r = .34 (an improvement from its original r = .16 average item-total correlation, at least). The average item-total correlation for the social distance subscale increased from r = .39 to r = .63. The average item-total correlation for the temporal distance subscale increased from r = .32 to r = .55. The average item-total correlation for the hypotheticality distance subscale increased from r = .49 to r = .52.

Table 3:
Reliability and Item-Total Correlations of Final Scale Items

	Average item-total correlation	***Scale Alpha***
	Item-total correlation	Alpha if dropped
Full scale	***.37***	***.77***
Social distance	***.63***	***.81***
I feel similar to most people / different from most people.	.61	.77
I like to keep people close / at a distance	.70	.73
If I were to meet a stranger, I would feel similar to them / different from them.	.55	.80
I feel like keeping people close / keeping people at a distance.	.67	.74
Hypotheticality distance	***.52***	***.75***
I feel more pragmatic / visionary.	.33	.77
I feel grounded in reality / detached from reality.	.48	*.71*
Most of my thoughts are about things that are likely / about things that are unlikely.	.59	*.68*
It is more comfortable to think about events that are real / hypothetical.	.61	*.66*
It is more comfortable to think about realistic things / fantastic things.	.56	*.68*
Temporal distance	***.55***	***.75***
I feel focused on the here and now / far from the present.	.59	.67
I feel focused on what is happening right now / things that are happening at another time.	.58	.68
It is more comfortable to think about events in the present / events in the future.	.54	*.70*
It is more comfortable to think about near-term goals / very distant future goals.	.50	.72
Spatial distance	***.34***	***.53***
I feel more comfortable with cozy spaces / big, vast spaces. big, vast spaces.	.39	.35
The world feels big / small.	.27	.54
It is more comfortable to think about places that are close by / places that are far away.	.37	.38

Factor Structure of Revised Scale

Parallel analysis on the revised scale suggested a 4-factor structure, as intended. A scree plot also seems to suggest a mostly clear 4-factor structure (see Figure 2). However, one of the factors (the spatial distance factor) is particularly weak. Using the current Kaiser (1974) cutoff criterion of retaining factors above eigenvalues of .70, three factors survive. Exploratory factor analysis on the revised scale, attempting to fit a four-factor model with Oblimin rotation, resulted in an RMSEA = .05 (improved from .06). The Tucker-Lewis Fit Index (TLI) also improved from .72 to .92.

Figure 2:
Scree Plot of Factor Structure of Revised Scale

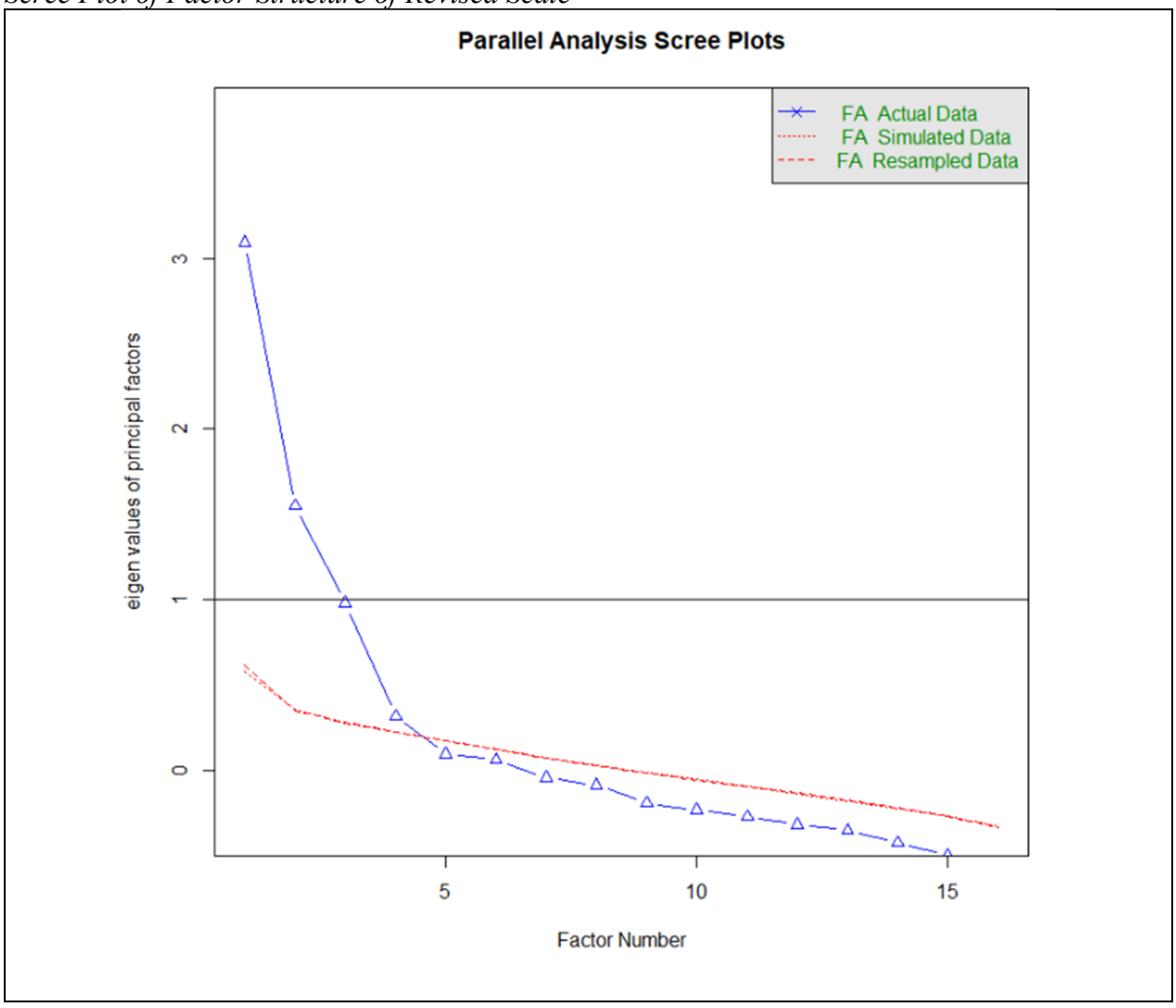


Table 4:
Factor Loadings for Items in Revised Scale

	Social	Temporal	Hypothetical	Physical
Social Distance				
I feel similar to most people / different from most people.	**0.65**	0.03	0.04	-0.02
I feel close to most people / distant from most people.	**0.83**	0.08	-0.01	-0.05
If I were to meet a stranger, I would feel similar to them / different from them.	**0.60**	-0.08	0.00	-0.07
I feel like keeping people close / keeping people at a distance.	**0.80**	-0.06	0.01	0.09
Temporal Distance				
It is more comfortable to think about near-term goals / very distant future goals.	-0.07	**0.55**	0.05	-0.07
I feel focused on the here and now / far from the present.	0.05	**0.73**	-0.06	0.10
I feel focused on what is happening right now / things that are happening at another time.	-0.01	**0.72**	0.07	0.06
It is more comfortable to think about events in the present / events in the future.	0.01	**0.60**	0.06	-0.09
Hypotheticality Distance				
I feel more pragmatic / visionary.	-0.13	-0.17	**0.36**	0.24
I feel grounded in reality / detached from reality.	0.15	0.04	**0.47**	0.09
Most of my thoughts are about things that are likely / about things that are unlikely.	0.06	-0.02	**0.59**	0.15
It is more comfortable to think about events that are real / hypothetical.	0.03	-0.04	**0.81**	-0.01
It is more comfortable to think about realistic things / fantastic things.	-0.07	0.14	**0.71**	-0.08
Physical Distance				
I feel more comfortable with cozy spaces / big, vast spaces.	-0.07	0.10	0.01	**0.56**
The world feels big / small.	-0.01	0.06	0.17	**0.30**
It is more comfortable to think about places that are close by / places that are far away.	0.08	0.17	0.08	**0.45**

Note. Loadings above .299 are in bold, as this was the threshold chosen for 'good' loadings (see above for justification and references).

Discussion of Study 1 Results

Overall, the initial measure development study was mostly successful. It resulted in a 16-item semantic differential scale with the intended four-factor structure, one factor for each

dimension of psychological distance. Three out of four subscales demonstrated good internal reliabilities and factor loadings, with the fourth subscale (spatial-psychological distance) demonstrating lower-than-conventionally-acceptable internal reliability but acceptable factor loadings.

Study 2: Measure Validation

Introduction

In Study 2, I assessed the construct validity of the PSYDIS measure of psychological distance. I also, as a secondary goal of this study, re-assessed the structure of the measure with new data. This structure assessment included a confirmatory factor analysis (CFA) to test for the expected factor structure and loadings. Hypotheses 1-2 state that the factor structure of the scale will conform to four latent factors (spatial, temporal, hypothetical, and social distance) with one superordinate factor (construal level).

Hypothesis 1: A four factor-model will fit the PSYDIS scale significantly better than a one-factor structure.

Hypothesis 2: A four-factor model with a single superordinate factor will fit the PSYDIS scale significantly better than a four-factor model alone.

Validity Testing Strategy

The traditional approach to measuring the construct validity of new measures involves demonstrating that the scale appears valid to those who know the construct well (content validity), correlates well with other measures of the same construct, and with measures of related constructs (convergent validity), predicts theoretically consistent outcomes (predictive validity), and provides unique utility in prediction (incremental validity; Westen & Rosenthal, 2003). In the following sections, I will outline my approach to establishing construct validity through these checks.

Content Validity Strategy

The PSYDIS items were reviewed by two subject matter experts in construal level (SMEs) as part of Study 1. These SMEs were researchers with PhDs in Organizational Psychology who had each conducted previous research on construal level. Items deemed as not ostensibly measuring one (and only one) of the four dimensions of psychological distance as intended were excluded or revised.

Convergent Validity with Existing Measures

To the extent that the PSYDIS accurately measures psychological distance, it should be highly correlated with existing measures of construal level (Trope & Liberman, 2010). There are at least 3 standout measures of construal level in the organizational psychology literature: Vallacher and Wegner's (1989) BIF, Venus et al.'s (2019) 3-item Work Construal Scale, and Reyt and Wiesenfeld's (2014) Work-Based Construal Level Scale. I expected the new PSYDIS scale to correlate significantly with all of these.

Hypothesis 3a: The Psychological Distance Scale (PSYDIS) will show a significant, positive correlation with scores on the Behavior Identification Form.

Hypothesis 3b: The Psychological Distance Scale (PSYDIS) will show a significant, positive correlation with scores on the Work Construal Scale.

Hypothesis 3c: The Psychological Distance Scale (PSYDIS) will show a significant, positive correlation with scores on the Work-Based Construal Level Scale.

Predictive Validity

To test the new scale's relationship with known outcomes of construal level, I assessed its relationship with creative performance, detail-oriented task performance, risk-taking and risk avoidance, approach and avoidance motivation, and temporal focus. Attitudes towards risk and (separately) creativity have each been predicted by construal level in previous studies (Lermer et al., 2015; Liberman et al., 2012). Finally, detail orientation has not been predicted before to my knowledge, but theoretically detail orientation is a core, definitional feature of construal level (Trope & Liberman, 2010).

Creative Performance. The same region of the brain implicated in high construal states (the Dorsal-Medial Prefrontal Cortex, dmPFC) lies within the area of the brain associated with creativity (the Default Mode Network), suggesting a potentially reliable relationship (Baetens et al., 2013; Kühn et al., 2014). Creativity has also been shown to associate with construal level in multiple studies (Polman et al., 2011). Liberman et al. (2012) primed abstract construal level and found that participants were able to generate more creative uses of a shoe. De Dreu et al. (2009) found that participants primed to be in high construal states were able to work around obstacles more creatively in negotiation. Finally, Forster et al. (2004) tested whether low-construal states might have a creative advantage in concrete tasks, but found only the significant relationship between high construal level and creativity demonstrated in other studies since. Given these findings, as well as the potential neurological relationship between creativity and construal level, I expected the PSYDIS scale to show a significant relationship with creativity.

Hypothesis 4: The Psychological Distance Scale will show a significant, positive correlation with creative task performance.

Detail Orientation. Trope and Liberman's (2010) original paper on construal level noted that abstract construal level involves a glossing-over of secondary details. By contrast, concrete 'low' construal states are defined in part as focusing on secondary, concrete details — as in, focusing on more nuanced, finer-grained aspects of the target. Vallacher and Selz (1991) further found that low construal levels involve bottom-up processing, and focusing on minutiae even to the extent of being unable to filter it effectively. Although construal level and detail-orientation have yet to be formally tested, the above suggests that it should be predicted by low construal level.

Hypothesis 5: The Psychological Distance Scale will show a significant, negative correlation with detail-oriented task performance.

Attitudes Towards Risk. Attitudes towards risk have been a focal outcome in many studies of construal level (Lermer et al., 2015; Raue et al., 2015). When operating at a high, abstract construal level, people tend to gloss over details, underestimate difficulty, and feel more confident in their predictions (Nussbaum et al., 2003; Trope & Liberman, 2010; Vallacher & Wegner, 1989). It is possible that these qualities of high construal level explain its identified relationship with greater risk-taking (i.e., one takes more risks because one does not see the obstacles). Risk-taking is a key outcome of construal level, and I expected the PSYDIS measure to correlate positively with it, and likewise to correlate negatively with risk avoidance.

Hypothesis 6a: The Psychological Distance Scale will show a significant, positive correlation with risk-taking.

Hypothesis 6b: The Psychological Distance Scale will show a significant, negative correlation with risk-avoidance.

Approach and Avoidance Motivation. Construal level has been associated with what type of motivation a person is sensitive to, with high construal levels being associated more with approach motivation and low construal levels associated with avoidance motivation (Nan, 2007). Hence, I expected that high construal level as indicated by high scores on the PSYDIS would be related to more approach motivation. Likewise, I excepted low scores on the PSYDIS to be related to more avoidance motivation.

Hypothesis 7a: The Psychological Distance Scale will show a significant, positive correlation with approach motivation.

Hypothesis 7b: The Psychological Distance Scale will show a significant, negative correlation with avoidance motivation.

Temporal Focus. Temporal focus is the notion that one may think disproportionately of the present, past, or future — or a combination thereof (Shipp et al., 2009). Although this has not been directly related to construal level, temporal focus has been shown to relate to workplace outcomes such as resilience, workers' perceived employment prospects, and organizational

citizenship behaviors (Cerdin et al., 2020; Lin & Liao, 2020; Strobel et al., 2013). It is possible that feeling distant in time from the present moment may create temporal distance and thus raise construal level (Förster et al., 2004). I expected the PSYDIS to be positively related to future and past orientation, and negatively related to present orientation.

Hypothesis 8a: The Psychological Distance Scale will show a significant, positive correlation with future temporal focus.

Hypothesis 8b: The Psychological Distance Scale will show a significant, positive correlation with past temporal focus.

Hypothesis 8c: The Psychological Distance Scale will show a significant, negative correlation with present temporal focus.

Subscale-Specific Work Outcomes. Given that a primary goal of the new PSYDIS measure was to provide additional utility in its granular, four-dimensional structure, I chose a unique work-related outcome to test the predictive validity of each subscale within the PSYDIS. The following sections describe those subscale-level predictive validity tests.

Social Distance: Organizational Citizenship Behaviors. Organizational citizenship behaviors (OCBs) are those which are "above and beyond the role requirements that are organizationally functional." In lay terms, an OCB is going out of your way at work to help coworkers and/or the company, beyond what you are required to do to get your paycheck (Graham, 1991). There is a subset of organizational citizenship behaviors that are specifically

interpersonal, such as going out of your way to help a coworker (Spector et al., 2010). Work in evolutionary psychology has found evidence that even slight increases in social similarity (kinship) can lead to increases in willingness to offer aid and assistance (Oates & Wilson, 2002). Given this deeply ingrained relationship between social closeness and willingness to help, I expect that lower (closer) social distance will be associated with increases in interpersonal-directed OCBs.

Hypothesis 9: The Social Distance dimension of the Psychological Distance Scale will show a significant, negative correlation with interpersonal-focused Organizational Citizenship Behaviors.

Hypotheticality Distance: Visioning. Visioning involves creating a mental image of a person or organization's hypothetical direction and capacity (Guillén & Florent-Treacy, 2011; Thoms & Blasko, 1999). In leadership research, visioning is related to 'getting ahead' behaviors, where leaders set an inspiring direction for the company. It requires imagining solutions and ideas beyond what presently exists. Hence, a person who scores on the PSYDIS as having high hypotheticality distance (meaning that they are far from reality in their thoughts) would perhaps be more likely to engage in visioning behaviors.

Hypothesis 10: The Hypotheticality subscale of the PSYDIS will have a significant, positive relationship with visioning behaviors.

Temporal Distance: Task Urgency. Time urgency is the degree to which individuals "concern themselves with the passage of time," including at work (Conte et al., 1998). Time urgency broadly has been related to several work-relevant variables, including deadline control, scheduling, and achievement striving (Conte et al., 1998). Task urgency is a subdimension of Landy et al.'s (1991) time urgency scale specifically concerned with how one relates to time in the workplace. It is possible that a greater sense of perceived distance in time could reduce awareness and salience of the immediate passage of time. Thus, I expected that the temporal distance dimension of the PSYDIS would negatively relate to task urgency.

Hypothesis 11: The Temporal Distance subscale of the PSYDIS will have a significant, negative relationship with task urgency.

Spatial Distance: Preference for Remote Work. A sense of spatial-psychological distance could be created by living or working in a remote or unfamiliar location (Trope & Liberman, 2010). Likewise, a sense of spatial closeness can be created by being in a central or familiar location (Trope & Liberman, 2010). Assuming that people chose their location, it is possible that those with a higher sense of spatial-psychological distance also prefer maintaining that spatial distance. In the workplace, spatial-psychological distance could be a useful predictor of preference for job features that are space-related like working remotely. Hence, I expect that the Spatial Distance dimension of the PSYDIS will positively relate to preference for remote work.

Hypothesis 12: The Spatial Distance subscale of the PSYDIS will have a significant, positive relationship with preference for remote work, such that a higher score on the spatial distance dimension will be associated with greater preference for working away from a central office.

Incremental Validity

The incremental utility of the PSYDIS measure was tested by predicting significant variance in two outcomes of construal level after controlling for other predictors of those same constructs. Specifically, I tested the PSYDIS scale's ability to predict creativity controlling for general intelligence, and to predict approach motivation controlling for industriousness.

General Intelligence and Creativity. Both general intelligence and construal level have been associated with creativity in separate studies (Liberman et al., 2012; Sligh et al., 2005). Although general intelligence has been shown to relate to performance on creativity tests (see Sligh et al., 2005), construal level may be more theoretically proximal to creativity than intelligence. Palmiero (2020) found that creativity is related to abstraction and focusing and the essence of targets, both of which are definitional features of high construal level according to Trope and Liberman (2010). If the PSYDIS scale measures construal level it should predict creativity beyond general intelligence.

Hypothesis 13: The Psychological Distance Scale will have a significant, positive relationship with creative performance, after controlling for general intelligence.

Approach Motivation and Industriousness. Construal level has been linked to approach motivation specifically, and to motivation in general (Nan, 2007; Wiesenfeld et al., 2017). However, theoretically it is thought to be highly related to approach motivation through construal level's focus on desirability, and less related to overall motivation. In personality research, industriousness "reflects the extent to which someone is hardworking and motivated" (Woods & Sofat, 2013). In this, industriousness served as a proxy for an amount of general motivation, and I expected that construal level would predict approach motivation above and beyond what is predicted by industriousness.

Hypothesis 14: The Psychological Distance Scale will show a significant, positive relationship with approach motivation, after controlling for industriousness.

Convergent Validity with Similar Constructs

Convergent validity of the PSYDIS was tested at the narrow, dimensional level. Each dimension of the PSYDIS was evaluated for its relationship with other constructs that are theoretically similar to that particular dimension. These tests sought to further demonstrate the theoretical validity of each individual subscale.

Hypotheticality and Openness. The central feature of the hypotheticality dimension of psychological distance is a detachment from reality. The less likely something is to happen, the greater its distance on the hypotheticality dimension. At the far end of unlikeliness is the realm of imagination (Bar-Anan et al., 2006). In Bar-Anan et al.'s (2006) example, a story about the ancient Greek god Zeus reading a paper is at a high construal, whereas a story about a hypothetical professor reading a paper is at a lower construal.

Fantasy or imagination is also a central feature of the personality trait Openness to Experience, such that Imagination is one of the identified facets of Openness to Experience. It is defined as "Having a vivid imagination and fantasy life" (Griffin & Hesketh, 2004, p. 244). This link between imagination as a sense of distance from probability, and imagination as a feature of trait openness, could better help explain the relationship that Levesque (2012) found between construal level broadly and Openness to Experience. Hence, this made a good candidate for testing the convergent validity of the hypotheticality dimension.

Hypothesis 15: The hypotheticality dimension of the PSYDIS scale will have a positive, significant relationship with Openness to Experience (Imagination dimension).

Social Distance and Spontaneous Trait Inference. A definitional feature of high construal level states is focusing on superordinate characteristics to the exclusion of secondary details (Trope & Liberman, 2010). When viewing people, superordinate characteristics are their traits and stable characteristics (Rim et al., 2009). Rim et al. (2009) found that priming a high construal level resulted in a greater focus on strangers' traits (versus their immediate behavior). This tendency to see traits more readily than immediate states and moods has been termed 'Spontaneous Trait Inference' (Badalà et al., 2008). While any psychological distance dimension could theoretically induce this trait inference about other people, it is possible that the social distance dimension specifically would be an especially potent correlate

Hypothesis 16: The social distance dimension of the PSYDIS scale will have a positive, significant relationship with Spontaneous Trait Inference.

Temporal Distance and Temporal Focus. Both Lee et al.'s (2017) work on time orientation and Shipp and Aeon's (2019) work on temporal focus suggest that people can focus more on the future, past, or present differentially. Shipp et al. (2009) termed this phenomenon *temporal focus*. While construal level broadly should be associated with either future or past temporal focus, the temporal distance dimension specifically should be a more precisely matched relationship with temporal focus.

Hypothesis 17a: The temporal distance dimension of the PSYDIS scale will have a positive, significant relationship with past temporal focus.

Hypothesis 17b: The temporal distance dimension of the PSYDIS scale will have a positive, significant relationship with future temporal focus.

Spatial Distance and Scale. An ideal construct for testing the convergent validity of the spatial distance subscale would be a psychological phenomenon that relates to the perception of distance, but is different from the perceived amount of distance between oneself and a target (which is the definition of spatial-psychological distance). Here, one's sense of physical scale may be a good candidate. Maglio and Trope (2011) demonstrated that high construal states are related to preferring larger measurement units when estimating scale. In their study, people at a high construal are more likely to estimate distances in, for example, centimeters versus millimeters. Maglio and Trope (2011) showed that this relationship is bi-directional with construal level, such that any change in construal level should produce shifts in the size of the

preferred measurement scale. They tested this relationship by approaching participants in person and asking them to estimate the length of a physical object held in front of them.

While a similar test might have been applicable to my current study, the COVID-19 pandemic in effect at this study's inception forced an online data collection. Replicating Maglio and Trope's (2011) method of having participants estimate a real object would have been difficult if participants were asked to do so on computer monitors of varying sizes. Given this constraint, I tested the effect of construal level on perceptions of physical scale by asking participants to estimate the height of a typical soda can. My thinking was that a familiar object would lend itself to easy guessing, and that participants with a more inflated sense of scale (due to a greater sense of distance in space) would estimate a taller height than those with a more concrete sense of scale.

Hypothesis 18: The physical distance dimension of the PSYDIS, will have a significant, positive relationship with physical scale, reflected in the estimated height of a soda can.

Methods

In this second study, a series of incremental, convergent, and predictive validity checks were performed on the PSYDIS measure. Additionally, its factor structure was again checked, this time with Confirmatory Factor Analysis. In the following sections, I will describe the measures and tests that were used for these validity checks, as well as the additional investigation of its factor structure.

Sample Characteristics

A sample of 425 online participants was collected from online participant pools (a combination of 82 online participants from Prolific and 343 from Amazon's Mechanical Turk service). Participants were paid $5.50 to complete the survey, which took 30.6 minutes on average (for an hourly rate of $10.78).

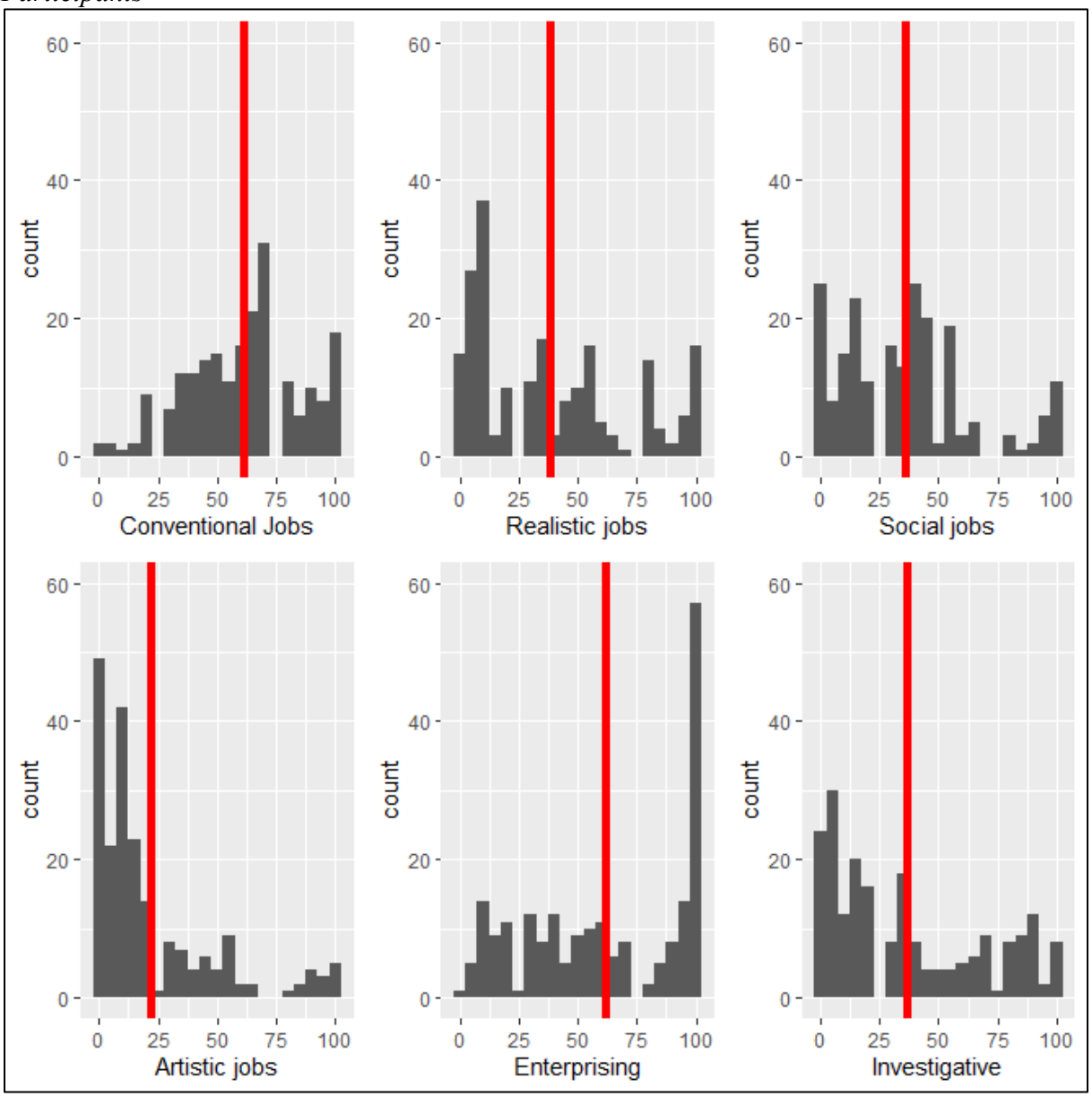
One participant was dropped for taking the survey more than once (their first response was kept; only the second response was dropped). Thirty-one participants were dropped for failing an attention check item (A fourth item added to the Innovation scale that instructed participants to select the "Needs much improvement" anchor option). Of those that remained, 138 participants were found to have copy-pasted responses to the creativity task from Google and were dropped. A final count of 255 participants (65 from Prolific and 190 from Mechanical Turk) both passed the attention check and seemed to provide genuine (self-written) answers to the creativity task. This final number is in line with Kline's (2011) recommendation of recruiting at least 200 participants for factor analysis.

Participants in the final sample aged from 18-years-old to 76-years-old (in both initial and final samples), with an average age of 35.7 in the initial sample, and 34.9 years in the final sample. Between Prolific and Mechanical Turk, participants in the smaller (n = 65) Prolific sample had a mean age of 28.9 versus 37.34 for the larger (n=190) Mechanical Turk sample. Participants sourced from Mechanical Turk all indicated that they lived in the United States. For the Prolific-sourced portion of the sample, all participants indicated that they were fluent in English, however their country of origin was spread across more countries: 29% indicated that they lived in the United States, 15% in Portugal, 14% in Mexico, 9% in the United Kingdom, 9%

in Poland, 6% in Canada, 3% from Greece, 3% from Italy, 3% from South Africa, and one participant each from France, Chile, Spain, and Belgium.

Participant Jobs. Participants provided their job title and O*Net occupation code. These O*Net occupation codes were used to retrieve Holland's (1959, 1997) Realistic (R), Investigative (I), Artistic (A), Social (S), Enterprising (E), and Conventional (C) (RIASEC) interest scores for each of the job titles provided by participants through O*Net Web Services (O*Net Web Services, 2021). For any given job listed on O*Net, O*Net offers a score indicating the degree to which that occupation typically involves activities of a certain RIASEC interest category. For example, O*Net offers that "Realistic occupations frequently involve work activities that include practical, hands-on problems and solutions." while artistic occupations "can be done without following a clear set of rules" (O*Net online, 2019). Figure 3 shows the frequency at which each interest score was encountered in the job titles provided by Study 2 participants. Generally, Study 2 participants seemed to indicate less artistic jobs. Further discussion of job interest scores in this study, including correlations between all Study 2 and Study 3 variables and job interests, can be found in the supplementary analysis section under Study 3.

Figure 3:
Distributions of Each Occupational Interests Relevant to the Job Titles Provided by Study 2 Participants



Note. X-axis shows 'interest relevance score' (from 0–100) provided by O*Net. Y-axis shows frequency of job titles provided by participants that had that interest relevant score.

Confirmatory Factor Analysis

Hypotheses 1–2 posit that a four-factor structure with one superordinate factor will fit the scale data better than a four-factor structure with no second-order factor or a single-factor structure. Confirmatory Factor Analysis (CFA) was used to test whether a four-factor structure

and then a four-factor structure with one superordinate factor fit the data. Comparative Fit Index (CFI) and Root Mean Square Error of Approximation (RMSEA) fit statistics were calculated to assess fit, with cutoffs of over .90 and under .08, respectively. An Analysis of Variance (ANOVA) was performed using the 'Lavaan' R package to test whether a four-factor and one superordinate factor or four-factor structure fit better than a one-factor model.

Convergent Validity with Existing Measures

Several of my hypotheses involved comparisons between the new PSYDIS scale and existing measures of construal level. To this end, participants completed Vallacher and Wegner's (1989) BIF, Venus et al.'s (2019) Work Construal Scale, and Reyt and Wiesenfeld's (2014) Work-Based Construal Level Scale. To test these hypotheses, a Pearson's correlation test was performed, with a significance threshold of alpha=.05.

Predictive Validity

Hypotheses 4−12 tested whether the PSYDIS could meaningfully predict valuable, work-related outcomes of construal level. In particular, I tested for relationships between the PSYDIS and creative performance, detail-oriented task performance, risk-taking and risk-avoidance, approach and avoidance motivation, temporal focus, organizational citizenship behaviors, visioning behaviors, task urgency, and preference for remote work. For each of these, a Pearson correlation test was performed with a significance threshold of alpha=.05. In the following sections, I will detail the measures used to assess each of these constructs.

Creative Performance. Creative performance was assessed with a divergent thinking task, which is a staple of creativity research (Gilhooly et al., 2007). My approach was modeled after the approach used in Silvia et al. (2008). Participants were given the name of an object (a brick) and asked to generate as many 'creative' uses for it as possible within a 3-minute time

frame. Silvia et al. (2008) noted that instructing participants explicitly to be creative increases the ceiling of creativity scores and increases the covariance with creativity-related personality traits. Participants were also asked to note their 'top 2' most creative responses, as Silvia et al. (2008) demonstrated that this Top 2 approach to scoring divergent thinking tasks helps researchers use rating time more efficiently during analysis while maintaining acceptable reliability.

In scoring these responses, I collected a sample of 33 participants from the Prolific online recruiting platform. Participants were screened to include only people who indicated that they lived in the United States and spoke English fluently. Each participant was first shown the definition of creativity proposed by Wilson et al. (1953) and used in Silvia et al. (2008): creative responses were defined as "uncommon, remote, and clever." Following this, they were shown the full list of 'brick use' ideas generated by the Study 2 participants, and asked to rate each idea on a scale of 1-5, with 1 being the least creative and 5 being the most creative. The list of ideas was alphabetized to help participants score similar items together (e.g., "weight" and "weight lifting").

Although Silvia et al. (2008) suggested that 2 raters is sufficient for generalizable creativity ratings, an initial pilot of n=5 raters revealed poor inter-rater agreement amongst the raters, with the highest-performing pair achieving a poor Cohen's Kappa of only (0.21), and Fleiss's Kappa for all 5 raters of only (.07). To compensate for this, I collected a larger total sample of 33 rater participants and treated the average of the 33 ratings for a given idea as the creativity score for that idea. The final creative performance score for each participant was the average score of their top two ideas (as in, each idea's score was the average rating of 33 ratings for that idea, and these two average ratings were combined and then divided by two). Incidentally, the Fleiss's Kappa score for all n=33 raters (*Kappa = .08*) was nearly identical to

the Kappa value for the n=2 rater pilot, supporting Silvia et al.'s (2008) contention that two or three raters is sufficient for generalizable agreement.

Detail-Oriented Task Performance. Detail orientated task performance was assessed with a string comparison task used to assess clerical aptitude (Bair, 1951). In this test, participants were shown ten items each containing a series of short text strings (street addresses) and asked to answer whether all strings in the series were identical under a time limit of 20 seconds per item (they were given 25 seconds for the first item in the series, to account for time spent orienting to the novel task and the layout with the timer). Participants were given one point for correctly identifying the different string, or for correctly answering that all strings were identical. Success at spotting minute differences was operationalized as the total 'correct' score across five items. These items can be found in Appendix M. The relationship between the PSYDIS and creative performance (Hypothesis 4) was tested by using a Pearson correlation test with a significance threshold of alpha = .05.

Attitudes Towards Risk. Risk taking and risk avoidance measures were taken from the International Personality Item Pool. Although these are technically two scales, they share many identical items, and largely assume that risk-avoidance is simply the reverse of the risk-taking score. However, two items are unique to risk avoidance, and two items are unique to risk taking. The full union of items across both scales was included in the survey, and then separated and scored as separate constructs (for example, reverse keyed items for risk taking were positive-keyed for measuring risk avoidance, and each scale's total reflects the shared items plus the two items unique to that scale). These items, which include items like "I would never make a high-risk investment." and "I am willing to try anything once." have been shown to exhibit an acceptable alpha reliability of $\alpha = .80$ and are listed in Appendix F (Tellegen & Waller, 2008).

The relationships between the PSYDIS and risk (Hypotheses 6a/b) were tested by using a Pearson correlation test with a significance threshold of alpha = .05.

Approach and Avoidance Motivation. Approach and avoidance motivation were measured by Carver and White's (1994) Behavior Activation Scale (BAS) and Behavior Inhibition Scale (BIS), respectively. The BAS consists of 14 items such as "When I see an opportunity for something I like, I get excited right away." and is designed to assess sensitivity to positively-valanced and rewarding stimuli. Campbell-Sills et al. (2004) analyzed the psychometric properties of the BAS and found its factor structure to be stable across studies and genders, and that it showed good convergent validity with positive affectivity. Note that the BAS also contains three subscales (Reward Responsiveness, Drive, and Fun Seeking). Although the BAS full scale demonstrated good alpha reliabilities in this study ($\alpha = .84$) and expected correlations with existing construal scales, I also analyzed its relationships at the subscale-level in the Supplementary Analysis section below. I employed the Behavior Inhibition Scale (BIS) as a measure of avoidance motivation. It contains 7 items (e.g., "If I think something unpleasant is going to happen I usually get pretty worked up.") designed to assess sensitivity to negatively-valanced stimuli.

Temporal Focus. Temporal focus was measured with Shipp et al.'s (2009) 12-item scale. This scale consists of three subscales, one for each type of foci: present temporal focus, past temporal focus, and future temporal focus. According to Shipp et al. (2009), each of these dimensions can vary independently. As in, they are not mutually exclusive or at opposite ends of a continuum. In Shipp et al.'s (2009) original study, the past, present, and future focus subscales demonstrated alpha reliabilities of $\alpha = .89$ (past), $\alpha = .75$ (present), and $\alpha = .86$ (future). Similar alphas were observed in this study (see Table 5). A Pearson correlation test was performed on

each subdimension of temporal focus with the PSYDIS (Hypotheses 8a, 8b, and 8c), and with the Temporal Distance dimension of the PSYDIS (Hypotheses 17a/b).

Organizational Citizenship Behaviors. Interpersonal OCBs were measured with a subset of Spector et al.'s (2010) Organizational Citizenship Behavior Checklist focused on interpersonal behaviors specifically. This subset includes items like "Took time to advise, coach, or mentor a co-worker." And "Lent a compassionate ear when someone had a work problem." It focuses specifically on those Organizational Citizenship Behaviors directed at others. The 10-item checklist that these 5 items were taken from demonstrated alpha reliabilities between $\alpha = 0.80$ to $\alpha = 0.86$ in Spector et al. (2010), similar to the $\alpha = .88$ reliability they demonstrated in this study.

Visioning. Visioning was measured with a single item modified from De Vries's (2004) Global Executive Leadership Inventory (GELI). De Vries (2004) found the visioning subscale of the GELI to have acceptable reliability of at least Ω (omega) = .88, which is above the recommended threshold of .70 (Rajput, 2015). The item "I inspire my people to look beyond existing limitations" was modified to "I look beyond my existing limitations" and used here to test personal visioning. As this was only a single item, I cannot estimate a coefficient alpha to test its reliability in the present study, but this single-item measure of visioning correlated significantly with innovation ($r = .28$, $p < .001$) in the present study, suggesting at least some construct validity.

Task Urgency. Task urgency was measured with the six 'task-related hurry' items from Landy et al.'s (1991) comprehensive time urgency measure. In creating their comprehensive scale of time urgency, Landy et al. (1991) composed some items to address work-related time urgency specifically, which they termed 'task-related hurry' (hereafter referred to ask task

urgency). These items were found to load well on a unique factor within the overall time urgency scale (Landy et al., 1991). They have shown adequate internal reliability (alpha = .72) and include items like “My work is slow and deliberate.” And “I am slow doing things.” In the present study, they demonstrated an acceptable alpha reliability of $\alpha = 0.83$. The association between temporal distance and task urgency was tested with a Pearson correlation test (alpha = .05).

Preference for Remote Work. Preference for remote work was measured with a single-item measure written based on Peters et al.’s (2004) teleworking study, which noted that remote work may not be binary: “teleworker status may represent a variable mixture of time spent at the regular workplace and at home during the course of the week” (Peters et al., 2004, p. 476). The single item reads “When it comes to working remotely (e.g., from home), what is your preference?” Item choices are on a 7-point semantic differential scale, ranging from “I prefer working all of my hours at my organization’s physical offices.” To “I prefer working all of my hours remotely (e.g., from home).” It also includes the midpoint “I don’t have a preference either way.” Peters et al. did not provide an alpha reliability estimate for the questionnaire used in their study, and given that it is a single-item measure I could not estimate its reliability in this study. However, I was unable to find a better measure of remote work preference for this study. The relationship between the spatial distance dimension of the PSYDIS and preference for remote work was tested with a Pearson correlation test (alpha = .05).

Incremental Validity

Hypotheses 13–18 tested the PSYDIS scale’s ability to predict unique variance above and beyond other constructs. The new PSYDIS measure overall was tested for its ability to predict

creativity controlling for general intelligence (Hypothesis 13), and to predict approach motivation controlling for industriousness (Hypothesis 14).

Measures. Creativity was measured using the divergent thinking 'brick uses' task described above. General intelligence was assessed using the Bilker et al. (2012) short form of Raven's (2000) advanced progressive matrices. Industriousness was assessed using the Industrious subscale of Cloninger et al.'s (1994) Temperament and Character Inventory (TCI). This scale presents ten Likert-format items such as "I am always busy", and "I accomplish a lot of work". It has previously demonstrated an alpha reliability of $\alpha = .78$, and in the present study showed an alpha reliability of $\alpha = .85$ (Cloninger et al., 1994; Ramanaiah et al., 2002).

Analysis. Hypotheses 13–18 were tested using hierarchical linear regression, with approach motivation and (in the second case) general intelligence entered first, and the PSYDIS entered second as predicting their respective outcomes. F-statistics were calculated for each regression coefficient to test that the PSYDIS produces a significant change in R^2.

Convergent Validity with Similar Constructs

As outlined above, convergent validity was assessed by testing the four dimensions of the PSYDIS scale for their relationships with narrow, dimension-relevant outcomes. These tests checked whether each dimension of the new scale correlated with measures of similar constructs. The Hypotheticality Distance dimension was tested for a relationship with Openness to Experience (Imagination facet), the Social Distance dimension with Spontaneous Trait Inference, the Temporal Distance dimension with Temporal Focus, and the Spatial Distance dimension was tested with a spatial distance manipulation.

Openness—Imagination. The Imagination facet of Openness to Experience was measured with the Openness - Imagination subscale of Soto and John's (2017) Big Five

Inventory–2 Short Form. These items have demonstrated strong agreement with longer measures of the Big Five, and the Imagination facet achieved a moderate test-retest reliability of .78 (Soto & John, 2017). In the present study it demonstrated a moderate alpha reliability $\alpha = .67$. The full set of items is listed in Appendix I.

Spontaneous Trait Inference. Spontaneous Trait Inference refers to people's tendency to ascribe superordinate, stable characteristics (e.g., "honest") to people. This was measured with a 5-item subset of Yang and Wang's (2016) example vignette sentence test, which is a variation of a test commonly used in the Spontaneous Trait Inference literature. Participants were presented with a series of sentences that imply a trait, like "Zhang Lei knocked at the door first before entering the room." They were then asked whether the preceding sentence contained a trait-relevant word (e.g., "Polite"). Research on Spontaneous Trait Inference has suggested that those who infer traits more readily will take longer to determine that the congruent trait was not present in the preceding stem (Yang & Wang, 2016). Thus, the response time to each item was used as the 'score' for that item, with higher response times indicating more Spontaneous Trait Inference. This is the same scoring method used by Yang and Wang (2016). Instructions and items for this test can be found in Appendix J.

Physical Scale Estimation. To test participants' sense of physical scale, participants were asked to estimate the height of a typical can of soda via a single item: "If you had to guess, how tall is a typical can of soda, in inches? (please provide your best guess)." They were then presented with a text field and allowed to enter a number in inches.

Results

Alpha reliabilities for all scales in this study can be found in Table 5. In general, nearly all scales demonstrated good alpha reliabilities (above alpha = .70). There were two exceptions:

the Spatial Distance subscale of the PSYDIS exhibited moderate reliability (alpha = .64) compared to the other subscales of the PSYDIS (consistent with the pattern found in study 1, described above). However, all subscales of the PSYDIS were significantly and positively correlated with each other (see Table 6). The two-item Openness to Experience – Fantasy scale also demonstrated moderate reliability (alpha = .67).

A one-factor model comprised of all PSYDIS items exhibited poor fit with the data (Comparative Fit Index = 0.51, RMSEA = .16, SRMR = .13, TLI = .44, df = 119, X^2 = 847). These fit indexes were all below the cutoffs for acceptability I defined prior to analysis (which were CFI over .90 and RMSEA under .08). A four-factor model, with items for social distance, hypotheticality distance, temporal distance, and spatial distance entered as separate factors, exhibited good fit (Comparative Fit Index = 0.92, RMSEA = .065, SRMR = .08, TLI = .90, df = 113, X^2 = 236). A 'four plus one' factor model, with one factor for each of the subscales and one superordinate factor (construal level, presumably), also exhibited an acceptable fit with the data (Comparative Fit Index = 0.90, RMSEA = .069, SRMR = .09, TLI = .89, df = 115, X^2 = 254).

Two Analysis of Variance (ANOVA) tests were performed to compare each of the factor models described above. These tests revealed that a four-factor model fit the data significantly better than a 'four plus one' factor model ($p < .001$). The four-factor model exhibited an Akaike's Information Criteria (AIC) of 10,991, while the 'four plus one' factor model exhibited a significantly worse fit of AIC = 11008. Both the four-factor and 'four plus one' factor models fit significantly better than a one-factor model (AIC = 11590). The best of the three models was the model with one factor for each dimension of psychological distance, but no superordinate factor. Thus, Hypothesis 1 was supported. Hypothesis 2, which postulated that a 'four plus one' model with a higher-order factor (presumably, construal level) would fit better than either a four-factor

or one-factor model was unsupported. This 'four plus one' model did fit the data well, and significantly better than the one factor model, but not as well as the more simple four-factor model.

Table 5:
Alpha Reliabilities for All Study 2 Measures

Measure	Alpha
PSYDIS	.81
PSYDIS-Social	.79
PSYDIS-Temporal	.80
PSYDIS-Hypo	.80
PSYDIS-Spatial	.64
BIF	.90
Work Construal	.78
WBCS	.84
Approach Mo.	.84
Avoidance Mo.	.87
Risk Taking	.84
Risk Avoid.	.88
Openness	.67
Innovation	.85
Raven's Matrices	.73
OCBs	.88
Task Urgency	.83
Industriousness	.85
Spontaneous Trait Inference	.84
Temporal Focus-Past	.86
Temporal Focus-Present	.81
Temporal Focus-Future	.85
Temporal Focus-Future/Past	.77

Table 6:
Correlations Between Subscales of the PSYDIS Measure

Variable	*M*	*SD*	1	2	3	4
1. PSYDIS	41.36	8.61				
2. PSYDIS-Social	12.95	3.71	.61**			
3. PSYDIS-Hypo	10.93	3.57	.78**	.28**		
4. PSYDIS-Temporal	9.22	2.95	.74**	.21**	.48**	
5. PSYDIS-Spatial	8.25	2.70	.52**	-.02	.24**	.33**

Note. M and *SD* are used to represent mean and standard deviation, respectively.
* indicates $p < .05$. ** indicates $p < .01$.

Convergent Validity with Existing Measures

Pearson correlation tests revealed no significant correlation between the PSYDIS (full scale score) and three existing measures of construal level. The PSYDIS did not significantly correlate with Vallacher and Wegner's (1989) Behavior Identification Form ($r = -.07$, $p = .24$), nor Venus et al.'s (2019) Work Construal Scale ($r = .05$, $p = .47$), nor Reyt and Wiesenfeld's (2014) Work-Based Construal Level measure ($r = -.07$, $p = .26$). Thus, Hypotheses 3a, 3b, and 3c were not supported.

This pattern mostly held for the subdimensions of the PSYDIS as well, with a few exceptions. Table 7 shows the correlations between dimensions of the PSYDIS and the three other measures of construal level: Vallacher and Wegner's (1989) BIF, Venus et al.'s (2019) Work Construal Scale, and Reyt and Wiesenfeld's (2014) Work Based Construal Scale. As can be seen in the table, the Social Distance dimension of the PSYDIS proved to be the most consistently related to other existing measures of construal level. Unfortunately, all the relationships were the opposite direction expected by theory, with a greater sense of social-psychological distance appearing to be associated with lower construal level.

The other three subscales showed only scattered and inconsistent relationships with existing measures of construal level. Outside the social distance scale, no other subscale correlated significantly (in either direction) with all three existing measures of construal level. Both the temporal and spatial distance subscales correlated significantly and in the expected direction with Venus et al.'s (2019) Work Construal Scale, but neither with the BIF nor the Work Based Construal Scale.

Table 7:
Relationship Between Dimensions of PSYDIS With Other Measures of Construal Level

	BIF	WCS	WBCS
Social Distance	-0.23***	-0.17**	-0.18**
Temporal Distance	0.11	0.12*	0.07
Hypotheticality Distance	-0.05	0.06	-0.07
Spatial Distance	0.03	0.17**	0.04

Predictive Validity

Contrary to expectations, the PSYDIS showed a significant, negative correlation with scores on the 'creative uses for a brick' test (see Table 8), meaning that Hypothesis 4 was not supported. This pattern held for the sub-dimensions as well, with hypotheticality, temporal distance, and spatial distance all showing significant, negative relationships with creative performance. The social distance dimension showed no significant relationship with creativity. Interestingly, this opposite-direction pattern observed among three of the four PSYDIS subscales was also consistent with the BIF, which also showed a small negative (but not significant) relationship with the creativity task.

The PSYDIS faired better on the other dynamic task of the study: the 'spot the difference' detail-orientation task. Here, the PSYDIS met expectations by showing a significant, negative correlation with detail-oriented task performance ($r = -.18^{**}$, $p < .01$), supporting Hypothesis 5. The Hypotheticality, Spatial distance, and Temporal distance subscales all showed this pattern as well, but the Social distance dimension did not show a significant relationship with detail-oriented task performance (see Table 9).

Table 8:
Means, Standard Deviations, and Correlations for the Brick Uses Creativity Task, the BIF, and the PSYDIS With Subscales

Variable	*M*	*SD*	1	2	3	4	5	6
1. Creativity	2.36	0.49						
2. BIF	40.92	6.31	-.12					
3. PSYDIS	41.36	8.61	-.17**	-.07				
4. Social	12.95	3.71	-.01	-.23**	.61**			
5. Hypothetical	10.93	3.57	-.16**	-.05	.78**	.28**		
6. Temporal	9.22	2.95	-.16*	.11	.74**	.21**	.48**	
7. Physical	8.25	2.70	-.14*	.03	.52**	-.02	.24**	.33**

Note. M and *SD* are used to represent mean and standard deviation, respectively.
* indicates $p < .05$. ** indicates $p < .01$.

Table 9:
Correlations Between Detail-Orientation Task, the PSYDIS, and Its Subscales

Variable	1	2	3	4	5	6
1. Detail Task Perf						
2. BIF	-.04					
3. PSYDIS	-.18**	-.07				
4. PSYDIS-Social	-.03	-.23**	.61**			
5. PSYDIS-Hypo	-.15*	-.05	.78**	.28**		
6. PSYDIS-Temporal	-.13*	.11	.74**	.21**	.48**	
7. PSYDIS-Spatial	-.19**	.03	.52**	-.02	.24**	.33**

* indicates $p < .05$. ** indicates $p < .01$.

Low Construal Outcomes. Hypotheses 6b,7b,8c posited that the PSYDIS would show a negative correlation with outcomes that theoretically should be related to low construal level: risk avoidance, avoidance motivation, and present orientation. The PSYDIS overall did not show a significant relationship with avoidance motivation (see Table 10). The social and hypothetical subscales did show significant relationships with avoidance motivation, but in the opposite of the expected direction. The temporal distance scale's relationship with avoidance motivation was not significant. However, the spatial distance dimension did show a significant, negative correlation with avoidance motivation. Overall, Hypothesis 7b was not supported (with the exception of spatial distance). However, the PSYDIS did show a significant, negative relationship with

present orientation, which held across all subscales except the physical distance dimension, supporting Hypothesis 8c.

The PSYDIS overall also showed a significant (negative) relationship in the expected direction with risk avoidance. Thus, Hypothesis 6b was supported. This held true for the hypotheticality, spatial, and temporal distance subscales as well. The social distance dimension did not show a significant relationship with risk avoidance.

Table 10:
Means, Standard Deviations, and Correlations for PSYDIS' Relationship With Low-Construal Outcomes

Variable	1	2	3	4	5	6	7
1. PSYDIS							
2. PSYDIS-Social	.61**						
3. PSYDIS-Hypo	.78**	.28**					
4. PSYDIS-Temporal	.74**	.21**	.48**				
5. PSYDIS-Spatial	.52**	-.02	.24**	.33**			
6. Risk Avoid.	-.25**	.03	-.19**	-.21**	-.34**		
7. Avoidance Mo.	.11	.19**	.22**	-.05	-.15*	.23**	
8. Temporal Focus (Present)	-.36**	-.16*	-.31**	-.41**	-.09	.14*	-.07

Note. M and *SD* are used to represent mean and standard deviation, respectively.
* indicates $p < .05$. ** indicates $p < .01$.

High Construal Outcomes. Hypothesis 6a, 7a, 8a, and 8b posit positive relationships between the PSYDIS scale and outcomes that should be associated with high construal level: approach motivation, future/past temporal focus, and risk taking. As expected, the PSYDIS showed a significant, positive correlation with risk taking (r = .24**, p < .01), supporting Hypothesis 6a. All subdimensions except for the social distance dimension also showed this positive, significant relationship with risk taking (see Table 11).

The PSYDIS total scale had no significant relationship with approach motivation (r = -.03, p = .60); Hypothesis 7a was not supported. The social distance dimension, consistent with its usual pattern, did show a significant relationship with approach motivation, but in the opposite

direction as expected. The remaining three dimensions showed no significant relationship with approach motivation.

The PSYDIS full scale showed no significant correlation with future temporal focus, showing that Hypothesis 8a was not supported. However, it did demonstrate the expected significant, positive relationship past temporal focus, supporting Hypothesis 8b. For the subscales, the social distance dimension showed a significant, negative correlation with future temporal focus (consistent with its theme of significant but opposite-of-theory results). The temporal distance dimension showed a significant, positive relationship with future temporal focus (but not past temporal focus), and the hypotheticality dimension showed a significant, positive relationship with past temporal focus (but not future temporal focus). The physical distance dimension showed a significant, positive correlation with past temporal focus, but not future temporal focus. See Table 11 for a summary of these relationships.

Table 11:
Correlations Between the PSYDIS, Its Subscales and High Construal Outcomes (Approach Motivation and Temporal Focus)

Variable	1	2	3	4	5	6	7	8
1. Risk Taking								
2. Approach Mo.	.41**							
3. TFocus-Future	.13*	.35**						
4. TFocus-Past	.07	.20**	.16**					
5. PSYDIS	.24**	-.03	.06	.13*				
6. PSYDIS-Social	-.01	-.20**	-.16*	.07	.61**			
7. PSYDIS-Hypo	.19**	.03	-.05	.22**	.78**	.28**		
8. PSYDIS-Temporal	.20**	.06	.31**	.06	.74**	.21**	.48**	
9. PSYDIS-Spatial	.30**	.06	.15*	-.04	.52**	-.02	.24**	.33**

Note. TFocus = Temporal Focus
* indicates $p < .05$. ** indicates $p < .01$.

Subscale Outcomes. In addition to the relationships between the full PSYDIS scale and work-related outcomes, I also tested the predictive validity of each subscale of the PSYDIS. Hypothesis 9 suggested that the social distance dimension of the PSYDIS would have a

significant, negative relationship with Organizational Citizenship Behaviors. This hypothesis was supported (r = -.23**, p < .01). OCBs were also significantly related to spatial distance (r = .23**, p < .01), but not to hypothetical or temporal distance.

Hypothesis 12 suggested a positive relationship between the spatial distance dimension of the PSYDIS and preferring remote work. The spatial distance dimension showed a significant correlation with preference for remote work, but the correlation was negative, which was the opposite of the expected direction (r = -.14, p < .02). Preference for remote work was not significantly correlated with hypothetical nor temporal distance, but it was significantly and positively correlated with social distance (r = .21**, p < .01).

Hypothesis 10 suggested that the PSYDIS' hypotheticality distance dimension would show a significant, positive relationship with visioning behaviors. This hypothesis was not supported (r = .07, p = .24). Visioning behaviors were significantly and positively related to temporal distance, but not to any of the other subdimensions. Hypothesis 11 stated that the temporal distance dimension of the PSYDIS would have a significant, negative relationship with task urgency. This hypothesis was supported (r = -.17**, p < .01). Task urgency was related to two of the three remaining subscales as well. It showed significant, negative relationships with social distance (r = -.29**, p < .01) and hypotheticality (r = -.26**, p < .01), but no significant relationship with spatial distance.

Incremental Validity

A series of tests were performed to assess whether the PSYDIS was able to predict variance in valued outcomes above and beyond existing measures. Hypothesis 13 suggested that the PSYDIS would have a significant, positive relationship with creative task performance, controlling for general intelligence. This hypothesis was not supported. General intelligence was

positively correlated with scores on the creativity task as expected based on theory (r = .26***, p < .001), and explained significant variance in creativity in a regression model (see Table 12). The PSYDIS full scale did explain additional unique variance in creativity when added after general intelligence, but in the opposite direction as expected. This opposite-direction pattern held for the hypotheticality, temporal, and physical distance dimensions as well, but none of the subscale relationships were significant (see Table 14).

Table 12:
Regression Results Using Creative Performance (on the Brick Uses Task) as the Criterion, and the PSYDIS as the Second Predictor After General Intelligence

	b	*Std. Error*	*t*	*p*	Fit
(Intercept)	1.99	0.24	8.27	< .001***	
Ravens Matrices	0.05	0.01	3.97	< .001***	
PSYDIS	-0.01	0.00	-2.28	.02*	
					R^2 = .09***

Note. A significant *b*-weight indicates the beta-weight and semi-partial correlation are also significant. *b* represents unstandardized regression weights.
* indicates $p < .05$. ** indicates $p < .01$. *** indicates p < .001

Table 13:
Regression Results Using Creative Performance (on the Brick Uses Task) as the Criterion, and the BIF as the Second Predictor After General Intelligence

	b	*Std. Error*	*t*	*p*	Fit
(Intercept)	1.91	0.28	6.83	< .001***	
Ravens Matrices	0.05	0.01	4.03	< .001***	
BIF	-0.01	0.01	-1.38	.17	
					R^2 = .07***

Note. A significant *b*-weight indicates the beta-weight and semi-partial correlation are also significant. *b* represents unstandardized regression weights.
* indicates $p < .05$. ** indicates $p < .01$. *** indicates p < .001

Table 14:

Regression Results for Each Subscale Using Creative Performance as the Criterion

Predictor	*b*	*beta*	sr^2	*r*	Fit
(Intercept)	1.99**				
Ravens Matrices	0.05**	0.23	.05	.26**	
Social	0.00	0.02	.00	-.01	
Hypothetical	-0.01	-0.09	.01	-.16**	
Spatial	-0.01	-0.05	.00	-.14*	
Temporal	-0.01	-0.08	.00	-.16*	
					R^2 = .093**

Note. A significant *b*-weight indicates the beta-weight and semi-partial correlation are also significant. *b* represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation.

* indicates $p < .05$. ** indicates $p < .01$.

In the second incremental validity check, Hypothesis 14 suggested that the PSYDIS scale would show a significant, positive relationship with approach motivation, after controlling for industriousness. This hypothesis was not supported (see Table 15 for regression results). While industriousness did predict a significant portion of the variance in approach motivation, the PSYDIS full scale did not predict significant additional variance. This is, again, unsurprising given that the PSYDIS failed to show any significant correlation with approach motivation on its own. In terms of subscales, the social distance dimension did explain significant unique variance in approach motivation controlling for industriousness, but in the opposite of the expected direction (see Table 17). The hypotheticality dimension, however, did explain unique variance in approach motivation above industriousness, and in the expected direction (see Table 17). The temporal and physical distance dimensions did not predict significant variance in approach motivation after controlling for industriousness.

Table 15:

Regression Results Using Approach Motivation as the Criterion and the PSYDIS as the Second Predictor After Industriousness

	b	*Std. Error*	*beta*	*t*	*p*	*r*	Fit
(Intercept)	36.29**	4.16		8.73	0.00**		
Industriousness	0.27**	0.07	0.24	3.86	0.00**	.24**	
PSYDIS	0.03	0.06	0.03	0.49	0.62	-.03	
							R^2 = .057**

Note. A significant *b*-weight indicates the beta-weight and semi-partial correlation are also significant. *b* represents unstandardized regression weights. *beta* indicates the standardized regression weights. *r* represents the zero-order correlation.
* indicates $p < .05$. ** indicates $p < .01$.

Table 16:

Regression Results Using Approach Motivation as the Criterion and the BIF as the Second Predictor After Industriousness

	b	*Std. Error*	*t*	*p*	Fit
(Intercept)	29.33***	3.69	7.95	0.000***	
Industriousness	0.21**	0.07	3.05	0.003**	
BIF	0.26**	0.08	3.29	0.001**	
					R^2 = .095**

Note. A significant *b*-weight indicates the beta-weight and semi-partial correlation are also significant. *b* represents unstandardized regression weights.
* indicates $p < .05$. ** indicates $p < .01$.

Table 17:

Regression Results Using Approach Motivation as the Criterion, and Each Dimension of the PSYDIS Entered After Industriousness

	b	*Std. Error*	*t*	*p*	Fit
(Intercept)	37.42	4.18	8.95	< .001***	
Industriousness	0.29	0.07	3.95	< .001***	
Social	-0.43	0.14	-3.13	.002**	
Hypothetical	0.35	0.17	2.07	.040*	
Physical	0.09	0.19	0.45	.652	
Temporal	0.08	0.20	0.40	.686	
					R^2 = .108***

Note. A significant *b*-weight indicates the beta-weight and semi-partial correlation are also significant. *b* represents unstandardized regression weights.
* indicates $p < .05$. ** indicates $p < .01$. *** indicates $p < .001$

Convergent Validity with Similar Constructs

Hypotheses 15-18 tested each subscale of the PSYDIS' relationship with similar constructs that it should correlate with: The hypotheticality dimension with Openness to Experience, the social distance dimension with Spontaneous Trait Inference, the temporal distance dimension with future and past temporal focus, and the spatial distance dimension with sense of scale. A significant relationship was found between the temporal distance subscale and future temporal focus ($r = .31^{**}$, $p < .01$), supporting Hypothesis 17b. None of the remaining hypotheses in this set were supported. The hypotheticality dimension of the PSYDIS showed a negative relationship with openness to experience ($r = -.13^{*}$, $p < .05$), the social distance dimension showed no relationship with Spontaneous Trait Inference ($r = 0.08$, $p = .22$), and the temporal distance dimension showed no relationship with past temporal focus ($r = .06$, $p = .37$). Finally, the spatial distance dimension did not show a significant relationship with sense of scale ($r = .04$, $p > .05$).

Supplementary Analysis

Given that the PSYDIS scale failed to confirm many of the validity hypotheses proposed in my second study, I re-tested each of the above hypotheses using the BIF. The results of this secondary analysis are summarized in Tables 19–20. Generally, the BIF showed expected significant relationships with the other measures of construal level that the PSYDIS failed to correlate with. It also showed the expected relationships with approach and avoidance motivation, which the PSYDIS failed to show. The BIF also showed the expected relationship with visioning ($r = .13$, $p < .05$) where the PSYDIS failed ($r = .08$, $p > .05$).

However, the BIF was not universally more predictive of construal-related outcomes than the PSYDIS. In the case of predicting risk taking, risk avoidance, and detail orientation, the

PSYDIS full scale performed better than the BIF. Note that the PSYDIS showed the significant, negative relationship with detail-orientated task performance that construal level theory suggests. The BIF was also negatively correlated with detail-oriented task performance, but the result did not reach statistical significance. In this way, the PSYDIS and BIF seemed at times to pick up each other's slack.

There were a few hypotheses where the BIF and PSYDIS agreed, but in a way that was contrary to expectations. Both the BIF and the PSYDIS showed negative correlations with performance on the creativity task (although only the PSYDIS was significant), despite the hypothesized positive relationship between high construal and creativity. Additionally, both the BIF and the PSYDIS' spatial distance dimension showed significant, negative correlations with preference for remote work, potentially suggesting that the assumption of the remote work hypotheses — that people in abstract construal levels prefer more remote work — may be incorrect.

Table 18:

Means, Standard Deviations, and Correlations With Confidence Intervals for All Study 2 Variables

Variable	*M*	*SD*	1	2	3	4	5	6	7
1. BIF	40.92	6.31							
2. WBCS	27.74	4.59	.74**						
3. Work Construal	10.39	2.69	.23**	.22**					
4. PSYDIS	41.36	8.61	-.07	-.07	.05				
5. PSYDIS-Social	12.95	3.71	-.23**	-.18**	-.17**	.61**			
6. PSYDIS-Hypo	10.93	3.57	-.05	-.07	.06	.78**	.28**		
7. PSYDIS-Temporal	9.22	2.95	.11	.07	.12*	.74**	.21**	.48**	
8. PSYDIS-Spatial	8.25	2.70	.03	.04	.17**	.52**	-.02	.24**	.33**
9. Detail Task Perf	8.55	1.12	-.04	.08	-.12	-.18**	-.03	-.15*	-.13*
10. Risk Taking	26.24	7.86	.02	-.05	.14*	.24**	-.01	.19**	.20**
11. Risk Avoid.	34.35	8.60	-.03	.04	-.14*	-.25**	.03	-.19**	-.21**
12. Approach Mo.	48.05	8.06	.25**	.09	.42**	-.03	-.20**	.03	.06
13. Avoidance Mo.	24.19	6.51	-.17**	-.22**	-.03	.11	.19**	.22**	-.05
14. Openness	7.24	2.11	.14*	.08	-.08	-.24**	-.23**	-.13*	-.14*
15. Creative Task Perf.	2.36	0.49	-.12	-.04	-.17**	-.17**	-.01	-.16**	-.16*
16. TFocus-Future	15.40	3.24	.31**	.19**	.26**	.06	-.16*	-.05	.31**
17. TFocus-Past	15.01	3.44	-.02	-.12	.11	.13*	.07	.22**	.06
18. TFocus-Present	15.58	2.96	.23**	.19**	.18**	-.36**	-.16*	-.31**	-.41**
19. TFocus-Future/Past	30.98	4.71	.36**	.25**	.29**	-.19**	-.21**	-.23**	-.04
20. OCBs	15.55	4.78	.18**	.13*	.29**	.00	-.23**	.03	.06
21. Visioning	3.38	0.84	.13*	.03	.11	.08	-.05	.07	.13*
22. Task Urgency	27.94	7.13	.24**	.10	.15*	-.31**	-.29**	-.26**	-.18**
23. Remote Work	5.02	1.99	-.16*	-.20**	-.21**	.09	.21**	.08	.03
24. Ravens Matricies	13.92	2.34	-.13*	-.12	-.17**	-.12	.04	-.13*	-.10
25. Industriousness	38.39	7.19	.24**	.21**	.17**	-.27**	-.19**	-.34**	-.06

Table 18 (cont'd)

	8	9	10	11	12	13	14	15
1. BIF								
2. WBCS								
3. Work Construal								
4. PSYDIS								
5. PSYDIS-Social								
6. PSYDIS-Hypo								
7. PSYDIS-Temporal								
8. PSYDIS-Spatial								
9. Detail Task Perf	-.19**							
10. Risk Taking	.30**	-.17**						
11. Risk Avoid.	-.34**	.19**	-.97**					
12. Approach Mo.	.06	-.05	.41**	-.41**				
13. Avoidance Mo.	-.15*	.01	-.25**	.23**	-.06			
14. Openness	-.12	.16*	-.03	.09	.18**	-.13*		
15. Creative Task Perf.	-.14*	.13*	-.13*	.17**	-.17**	.05	.27**	
16. TFocus-Future	.15*	-.02	.13*	-.14*	.35**	-.14*	.21**	-.06
17. TFocus-Past	-.04	.00	.07	-.10	.20**	.31**	-.04	.02
18. TFocus-Present	-.09	.04	-.13*	.14*	.13*	-.07	.11	.05
19. TFocus-Future/Past	.05	.01	.01	-.01	.32**	-.14*	.21**	-.01
20. OCBs	.23**	-.16**	.17**	-.20**	.32**	-.00	.08	-.03
21. Visioning	.07	-.10	.22**	-.23**	.23**	-.21**	.16*	-.06
22. Task Urgency	-.04	.09	.04	-.05	.32**	-.06	.17**	-.05
23. Remote Work	-.14*	-.00	-.10	.10	-.18**	.07	-.06	.00
24. Ravens Matricies	-.16*	.34**	-.09	.11	-.09	.07	.20**	.26**
25. Industriousness	-.06	.14*	-.23**	.23**	.24**	-.11	.36**	.18**

Table 18 (cont'd)

	16	17	18	19	20	21	22	23	24
1. BIF									
2. WBCS									
3. Work Construal									
4. PSYDIS									
5. PSYDIS-Social									
6. PSYDIS-Hypo									
7. PSYDIS-Temporal									
8. PSYDIS-Spatial									
9. Detail Task Perf									
10. Risk Taking									
11. Risk Avoid.									
12. Approach Mo.									
13. Avoidance Mo.									
14. Openness									
15. Creative Task Perf.									
16. TFocus-Future									
17. TFocus-Past	.16**								
18. TFocus-Present	.15*	-.03							
19. TFocus-Future/Past	.78**	.09	.73**						
20. OCBs	.23**	.04	.11	.23**					
21. Visioning	.22**	-.01	-.06	.11	.21**				
22. Task Urgency	.16*	-.05	.23**	.26**	.26**	.02			
23. Remote Work	-.09	-.03	-.13*	-.15*	-.15*	.12*	-.15*		
24. Ravens Matricies	.06	.12	-.02	.03	-.17**	-.09	-.03	.10	
25. Industriousness	.36**	.02	.30**	.44**	.36**	.10	.41**	-.15*	.13*

Note. M and *SD* are used to represent mean and standard deviation, respectively. TFocus = Temporal Focus.
* indicates $p < .05$. ** indicates $p < .01$.

Table 19:
Comparison of PSYDIS and BIF Correlations With Outcome Variables

	r (PSYDIS)	*r* (BIF)
Hypothesis 3a: The Psychological Distance Scale (PSYDIS) will show a significant, positive correlation with scores on the Behavior Identification Form.	-.07	1.00
Hypothesis 3c: The Psychological Distance Scale (PSYDIS) will show a significant, positive correlation with scores on the Work-Based Construal Level Scale.	-.07	.74***
Hypothesis 3b: The Psychological Distance Scale (PSYDIS) will show a significant, positive correlation with scores on the Work Construal Scale.	.05	.23***
Hypothesis 4: The Psychological Distance Scale will show a significant, positive correlation with creative task performance.	-.17**	-.12
Hypothesis 5: The Psychological Distance Scale will show a significant, negative correlation with detail-oriented task performance.	-.18*	-.04
Hypothesis 6a: The Psychological Distance Scale will show a significant, positive correlation with risk-taking.	.24***	.02
Hypothesis 6b: The Psychological Distance Scale will show a significant, negative correlation with risk-avoidance.	-.25***	-.03
Hypothesis 7a: The Psychological Distance Scale will show a significant, positive correlation with approach motivation.	-.03	.25***
Hypothesis 7b: The Psychological Distance Scale will show a significant, negative correlation with avoidance motivation.	.11	-.17**
Hypothesis 8a: The Psychological Distance Scale will show a significant, positive correlation with future temporal focus.	.06	.31***
Hypothesis 8b: The Psychological Distance Scale will show a significant, positive correlation with past temporal focus.	.13*	-.02
Hypothesis 8c: The Psychological Distance Scale will show a significant, negative correlation with present temporal focus.	-.36***	.23***
Hypothesis 9: The Social Distance dimension of the Psychological Distance Scale will show a significant, negative correlation with interpersonal-focused Organizational Citizenship Behaviors.	-.23***	.18**
Hypothesis 10: The Hypotheticality subscale of the PSYDIS will have a significant, positive relationship with visioning behaviors.	.07	.13
Hypothesis 11: The Temporal Distance subscale of the PSYDIS will have a significant, negative relationship with task urgency.	-.18**	.24
Hypothesis 12: The Spatial Distance subscale of the PSYDIS will have a significant, positive relationship with preference for remote work, such that a higher score on the spatial distance dimension will be associated with greater preference for working away from a central office.	-.14*	-.16*

Table 20:
Incremental & Convergent Validity

	r (PSYDIS)	*r* (BIF)
Hypothesis 13: The Psychological Distance Scale will have a significant, positive relationship with creative performance, after controlling for general intelligence.	Unsupported (Table 12)	Unsupported (Table 13)
Hypothesis 14: The Psychological Distance Scale will show a significant, positive relationship with approach motivation, after controlling for industriousness.	Unsupported (Table 15)	Supported (Table 16)
Hypothesis 15: The hypotheticality dimension of the PSYDIS scale will have a positive, significant relationship with Openness to Experience (Imagination dimension).	Unsupported -.13*	Supported .14*
Hypothesis 16: The social distance dimension of the PSYDIS scale will have a positive, significant relationship with Spontaneous Trait Inference.	Unsupported -.08	Supported .19**
Hypothesis 17a: The temporal distance dimension of the PSYDIS scale will have a positive, significant relationship with past temporal focus.	Unsupported .06	Unsupported -.02
Hypothesis 17b: The temporal distance dimension of the PSYDIS scale will have a positive, significant relationship with future temporal focus.	Supported .31***	Supported .31***
Hypothesis 18: The physical distance dimension of the PSYDIS, will have a significant, positive relationship with estimated heights of a soda can.	Unsupported .04	Unsupported .05

Subscale and Predictive Validity

Table 21 shows how each of the subscales in the PSYDIS related to the outcomes chosen as predictive validity tests. No single subscale was fully predictive across all outcomes (i.e., related significantly to all of the chosen construal level outcomes). The most potent subscale for predictive relationships seemed to be the hypotheticality distance scale, which significantly predicted attitudes towards risk, avoidance motivation, temporal focus, and performance on the detail-oriented task. However, the hypotheticality dimension failed to correctly predict the

outcome it was most theoretically related to (creative task performance) making its overall predictive success hard to interpret.

Table 21:
Subscale-Level Predictive Validity for Construal Level Outcomes—Correlations Between Subscales and Outcomes

	Creativity	Detail	Avoid	Appro	RiskAv	RiskTake	TF-FtrPst	TF-Pres
Social Distance	-0.01	-0.03	0.19**	-0.20**	0.03	-0.01	-0.21***	-0.16*
Temporal Distance	-0.16**	-0.13*	-0.05	0.06	-0.21***	0.2**	-0.04	-0.41***
Hypotheticality Distance	-0.16**	-0.15*	0.22***	0.03	-0.19**	0.19**	-0.23***	-0.31***
Spatial Distance	-0.14***	-0.19**	-0.15*	0.06	-0.34***	0.30***	0.05	-0.09

Note. Creativity = Creative performance on "ideas for a brick" task. Detail = Performance on string difference detection task. Avoid = Avoidance motivation. Appro = Approach motivation. RiskAv = Risk Avoidance. RiskTake = Risk Taking. TF-FtrPst = Temporal focus outside the present (combination of future and past). TF-Pres = Temporal focus in present.
* = $p < .05$, ** = $p < .01$, *** = $p < .001$.

How Did the PSYDIS Relate to the Different Subdimensions of Approach Motivation?

As mentioned above, Carver and White's (1994) BAS scale was used to measure approach motivation in this study. This scale has three subscales within it: Reward Sensitivity, Drive, and Fun Seeking. Hierarchical linear regressions were performed to re-test Hypothesis 14 — the incremental effect of construal level on approach motivation, controlling for industriousness —assessing each different subscale of the BAS with each different subscale of the PSYDIS, and the BIF (see Tables 22 – 32). As expected by theory and previous literature on construal level, the BIF showed a positive, significant relationship with total BAS score, Reward Sensitivity, and Drive (over and above industriousness). However, it showed no significant relationship with Fun Seeking.

The most consistent finding from this analysis when using the PSYDIS was that the PSYDIS full scale and most of its dimensions (excluding temporal distance) predicted significant variance in the "Fun Seeking" dimension above industriousness, but in all these cases industriousness became a nonsignificant predictor of Fun Seeking. Also, the social distance dimension's relationship with BAS – Fun was (yet again) in the opposite of the expected direction. Industriousness did always predict significant variance in Reward Seeking and Drive. Neither the full PSYDIS nor most of the dimensions were able to account for unique variance in BAS - Drive above industriousness, with the one exception of the social distance dimension, which showed a significant relationship with BAS – Drive but in the opposite of the expected direction.

Aside from the Fun Seeking and Drive dimensions, the PSYDIS full scale showed a significant, incremental predictive relationship with BAS - Reward Sensitivity, but in the opposite direction. Social distance significantly predicted BAS – Reward Sensitivity above

industriousness but did so negatively (consistent with the social distance subscale's pattern of achieving significant relations that are opposite of theory). Spatial distance, which earlier failed to predict unique variance in total approach motivation, was able to predict unique variance in reward responsiveness above industriousness, but like the social distance scale it did so negatively and opposite of theory. The hypotheticality dimension, which predicted significant variance (positively) in the BAS full scale above industriousness, also predicted BAS – Reward above industriousness. Temporal distance did not significantly predict BAS – Reward above industriousness.

Table 22:

Regression Results Using Approach Motivation (Total) as the Criterion

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	29.33**	[22.06, 36.59]						
Industriousness	0.21**	[0.07, 0.35]	0.19	[0.07, 0.31]	.03	[-.01, .08]	.24**	
BIF	0.26**	[0.10, 0.41]	0.20	[0.08, 0.32]	.04	[-.01, .08]	.25**	
								R^2 = .095** 95% CI[.03,.16]

Note. A significant *b*-weight indicates the beta-weight and semi-partial correlation are also significant. *b* represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.
* indicates $p < .05$. ** indicates $p < .01$.

Table 23:

Regression Results Using Approach Motivation (Reward) as the Criterion

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	11.94**	[9.34, 14.53]						
Industriousness	0.16**	[0.11, 0.21]	0.38	[0.26, 0.49]	.14	[.06, .21]	.41**	
BIF	0.07*	[0.01, 0.12]	0.14	[0.03, 0.26]	.02	[-.01, .05]	.23**	
								R^2 = .189** 95% CI[.11,.27]

Note. A significant *b*-weight indicates the beta-weight and semi-partial correlation are also significant. *b* represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.
* indicates $p < .05$. ** indicates $p < .01$.

Table 24:

Regression Results Using Approach Motivation (Drive) as the Criterion

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	3.45*	[0.04, 6.86]						
Industriousness	0.12**	[0.06, 0.19]	0.23	[0.11, 0.35]	.05	[-.00, .10]	.28**	
BIF	0.14**	[0.07, 0.21]	0.23	[0.11, 0.35]	.05	[-.00, .10]	.28**	
								R^2 = .129** 95% CI[.06,.20]

Note. A significant *b*-weight indicates the beta-weight and semi-partial correlation are also significant. *b* represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.
* indicates $p < .05$. ** indicates $p < .01$.

Table 25:

Regression Results Using Approach Motivation (Fun) as the Criterion

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	13.94**	[10.35, 17.53]						
Industriousness	-0.07*	[-0.14, -0.00]	-0.13	[-0.26, -0.01]	.02	[-.01, .05]	-.11	
BIF	0.05	[-0.03, 0.13]	0.08	[-0.04, 0.21]	.01	[-.01, .03]	.05	
								R^2 = .019 95% CI[.00,.06]

Note. A significant *b*-weight indicates the beta-weight and semi-partial correlation are also significant. *b* represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.
* indicates $p < .05$. ** indicates $p < .01$.

Table 26:

Regression Results Using Approach Motivation (Total) as the Criterion

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	36.29**	[28.11, 44.48]						
Industriousness	0.27**	[0.13, 0.41]	0.24	[0.12, 0.37]	.06	[.00, .11]	.24**	
PSYDIS	0.03	[-0.09, 0.15]	0.03	[-0.09, 0.16]	.00	[-.01, .01]	-.03	
								R^2 = .057** 95% CI[.01,.12]

Note. A significant *b*-weight indicates the beta-weight and semi-partial correlation are also significant. *b* represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.
* indicates $p < .05$. ** indicates $p < .01$.

Table 27:

Regression Results Using Approach Motivation (Reward) as the Criterion

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	16.66**	[13.79, 19.52]						
Industrious-ness	0.16**	[0.11, 0.21]	0.38	[0.26, 0.49]	.13	[.06, .21]	.41**	
PSYDIS	-0.05*	[-0.09, -0.00]	-0.13	[-0.25, -0.01]	.02	[-.01, .04]	-.23**	
								R^2 = .186** 95% CI[.10,.26]

Note. A significant *b*-weight indicates the beta-weight and semi-partial correlation are also significant. *b* represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.
* indicates $p < .05$. ** indicates $p < .01$.

Table 28:

Regression Results Using Approach Motivation (Drive) as the Criterion

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	7.43**	[3.56, 11.30]						
Industrious-ness	0.15**	[0.09, 0.22]	0.29	[0.17, 0.41]	.08	[.01, .14]	.28**	
PSYDIS	0.01	[-0.04, 0.07]	0.03	[-0.10, 0.15]	.00	[-.01, .01]	-.05	
								R^2 = .080** 95% CI[.02,.15]

Note. A significant *b*-weight indicates the beta-weight and semi-partial correlation are also significant. *b* represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.
* indicates $p < .05$. ** indicates $p < .01$.

Table 29:

Regression Results Using Approach Motivation (Fun) as the Criterion

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	12.20**	[8.26, 16.14]						
Industrious ness	-0.04	[-0.11, 0.03]	-0.08	[-0.20, 0.05]	.01	[-.01, .02]	-.11	
PSYDIS	0.06*	[0.01, 0.12]	0.14	[0.02, 0.27]	.02	[-.01, .05]	.16**	
								R^2 = .032* 95% CI[.00,.08]

Note. A significant *b*-weight indicates the beta-weight and semi-partial correlation are also significant. *b* represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.
* indicates $p < .05$. ** indicates $p < .01$.

Table 30:

Regression Results Using Approach Motivation (Reward) as the Criterion

Predictor	*B*	*b* 95% CI [LL, UL]	*beta*	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	16.73**	[13.89, 19.58]					
Industriousness	0.18**	[0.13, 0.23]	0.42	.15	[.08, .23]	.41**	
Social Distance	-0.13**	[-0.23, -0.04]	-0.16	.02	[-.01, .06]	-.20**	
Hypothetical Distance	0.15**	[0.04, 0.27]	0.18	.02	[-.01, .05]	-.09	
Spatial Distance	-0.27**	[-0.40, -0.14]	-0.24	.05	[.00, .10]	-.23**	
Temporal Distance	-0.05	[-0.18, 0.09]	-0.04	.00	[-.01, .01]	-.10	
							R^2 = .251** 95% CI[.15,.32]

Note. A significant *b*-weight indicates the beta-weight and semi-partial correlation are also significant. *b* represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.
* indicates $p < .05$. ** indicates $p < .01$.

Table 31:

Regression Results Using Approach Motivation (Drive) as the Criterion

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	8.19**	[4.24, 12.14]						
Industriousness	0.15**	[0.08, 0.21]	0.27	[0.14, 0.40]	.06	[.01, .12]	.28**	
Social Distance	-0.14*	[-0.27, -0.01]	-0.13	[-0.26, -0.00]	.02	[-.01, .04]	-.16**	
Hypothetical Distance	0.02	[-0.14, 0.17]	0.01	[-0.13, 0.16]	.00	[-.00, .00]	-.06	
Spatial Distance	0.09	[-0.09, 0.27]	0.06	[-0.07, 0.19]	.00	[-.01, .02]	.08	
Temporal Distance	0.10	[-0.08, 0.29]	0.08	[-0.06, 0.22]	.00	[-.01, .02]	.06	
								R^2 = .106** 95% CI[.03,.17]

Note. A significant *b*-weight indicates the beta-weight and semi-partial correlation are also significant. *b* represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.

* indicates $p < .05$. ** indicates $p < .01$.

Table 32:

Regression Results Using Approach Motivation (Fun) as the Criterion

Predictor	*b*	*b* 95% CI [LL, UL]	*beta*	*beta* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	*r*	Fit
(Intercept)	12.50**	[8.58, 16.42]						
Industriousness	-0.04	[-0.11, 0.03]	-0.07	[-0.20, 0.05]	.00	[-.01, .02]	-.11	
Social Distance	-0.16*	[-0.29, -0.03]	-0.16	[-0.28, -0.03]	.02	[-.01, .06]	-.10	
Hypothetical Distance	0.18*	[0.02, 0.34]	0.17	[0.02, 0.31]	.02	[-.01, .05]	.20**	
Spatial Distance	0.27**	[0.09, 0.45]	0.19	[0.06, 0.31]	.03	[-.01, .07]	.24**	
Temporal Distance	0.02	[-0.16, 0.20]	0.02	[-0.13, 0.16]	.00	[-.00, .00]	.13*	
								R^2 = .105** 95% CI[.03,.16]

Note. A significant *b*-weight indicates the beta-weight and semi-partial correlation are also significant. *b* represents unstandardized regression weights. *beta* indicates the standardized regression weights. sr^2 represents the semi-partial correlation squared. *r* represents the zero-order correlation. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.

* indicates $p < .05$. ** indicates $p < .01$.

Discussion

The PSYDIS full scale failed to show expected correlations with existing construal measures, but did predict detail orientation, risk taking, risk avoidance, past temporal focus, present temporal focus, and task urgency in the expected direction. The temporal distance subscale successfully predicted future temporal focus, and task urgency. The hypotheticality dimension predicted attitudes towards risk, avoidance motivation, present temporal focus, and task urgency. Aside from these theory-expected relationships, many non-significant and opposite-of-expected relationships were found with the PSYDIS and its dimensions. For example, preference for remote work and OCBs were also predicted by their hypothesized subscales, but in the opposite of the expected direction.

The social distance subscale, especially, behaved uniquely. It did not work at all as expected, but it at least 'failed' in an interesting way. It correlated significantly with all three existing construal level scales, as well as many construal level outcomes: approach/avoid motivation, openness to experience, task urgency, temporal focus, and even its specially-matched outcome of organizational citizenship behaviors. However, it did all of these in the opposite of the expected direction. One possible explanation for this is that feeling close to 'most people' involves some degree of abstraction and seeing people as a unified whole. When one thinks about people more concretely and sees heterogeneity in the concept of 'people', perhaps it is easier to feel more distant from them. It is also possible that the social distance scale achieved so much potency (albeit in the wrong direction) because it was the only one of the four scales with a concrete target (people).

Given that neither the PSYDIS overall nor its subscales correlated significantly in the expected direction with most other existing measures of construal level, it cannot be inferred that

the PSYDIS overall is a valid measure of construal level. Further, although the temporal, physical, and hypotheticality subscales seem to have some utility in predicting valued outcomes, and the temporal and spatial distance dimension showed significant correlations with Venus et al.'s (2019) Work Construal Scale, without consistent correlations with other measures of Construal Level (especially the standard BIF measure), their usage may be hard to theoretically justify in their current form.

Exploratory analysis comparing the PSYDIS to the BIF revealed that neither the PSYDIS measure nor the BIF alone showed all the expected predictive relationships between construal level and outcomes. However, the BIF and PSYDIS seemed to pick up each other's slack. For example, while the BIF failed to show the expected relationship with risk taking and risk avoidance, the PSYDIS did show those relationships. Taken together, nearly every hypothesis predicted by CL theory was supported between the two scales, but neither one scored perfectly.

Unexpectedly, both the BIF and PSYDIS had negative correlations with creative task performance (although only the PSYDIS was significant). It is possible that the PSYDIS and BIF were negatively correlated with attention, which is why they both showed negative correlations with both creative task performance and detail task performance (although again, only the PSYDIS was significant), as both of these tasks required additional focus and attention on the part of the participants.

Finally, it was interesting that participants who felt distant in space (i.e., scored high on the spatial-psychological distance dimension) were significantly less likely to prefer working remotely. It is possible that feeling physically distant makes one crave closeness, and vice-versa. Alternatively, many participants could have felt involuntarily psychologically distant due to

external factors (e.g., the COVID-19 pandemic), which could have introduced an unpredictable confound in this hypothesis.

Study 3: A Repeated-Measures Study of Construal Level

Introduction

In Study 3, I captured multiple assessments of construal level within-person over the course of a week, creating a distribution of construal levels for each participant, then used characteristics of those distributions to test for between-person consequences of within-person variability in construal level. Studies are rare that capture construal level across more than two time points. Addressing this gap alone (capturing construal level at more than two time points), and in the process attaining a better estimate of construal level's test-retest reliability across time, could be a significant contribution to construal level theory. However, I also aimed for a larger contribution. Consistent with Fleeson and Jayawickreme's (2015) approach, I attempted to capture both the flux and average set point of construal level. In doing so, Study 3 may be one of the first to measure consequences of individual differences in construal level that also measures those individual differences by modern standards, and the first that studies personal variation in construal level as its own unique variable.

Given that the PSYDIS measure did not pass many of the validity checks I applied to it, I included both the PSYDIS and BIF alongside each other in this study. I collected a distribution of daily construal levels (measured with both the PSYDIS and BIF) from a sample of full-time workers. From this, I investigated the between/within-person variance of construal level, as well as between-person outcomes of individual differences in both average construal level and variability in construal level. In the following sections, I will describe the specific outcomes I included, tests I performed, and the reasoning for each.

Between/Within-Person Variance of Construal level

A central question of the current research is whether there are meaningful individual differences in construal level when it is measured according to the modern standard of collecting a within-person distribution of states over time, and showing stability in those states (Fleeson, 2004). As described above, there is already theoretical and small amounts of empirical support for the notion of people having different, stable 'set points' in construal level. As such, I expect there to be significant between-person variance in construal level.

Hypothesis 19a: Construal level, measured with the PSYDIS, will show stable, between-person differences, after accounting for within-person fluctuations.

Hypothesis 19b: Construal level, measured with the BIF, will show stable, between-person differences, after accounting for within-person fluctuations.

Outcomes of Average Construal Level

Consistent with Fleeson (2004), most individual differences exhibit both stability and change within individuals. According to Whole Trait Theory, a between-person difference in the level of a 'trait' should appear as people having significantly different *average* levels of that characteristic. Thus, the average construal level of our participants was treated as their 'set point' of sorts and was used to predict valuable work-related outcomes.

Creativity. As described above, creativity and construal level have been linked in several studies (De Dreu et al., 2009; Liberman et al., 2012). Further, creativity and high construal level may share some overlapping brain activation patterns (Baetens et al., 2013; Kühn et al., 2014).

Given these links, it stands to reason that a person who exhibits typically higher construal level may also exhibit typically higher creativity.

Hypothesis 20a: Average construal level, measured with the PSYDIS, will be significantly and positively related to creativity.

Hypothesis 20b: Average construal level, measured with the BIF, will be significantly and positively related to creativity.

However, average construal level alone may not fully capture the relationship between construal level and creativity. For example, it is possible to spend a single day thinking mostly abstractly (e.g., while working away from the office or thinking about a novel problem) and the rest of a week at a middling or low construal level. In this case, one could not be said to have a *stable* high construal, and may not necessarily typically perform better on creative tasks, compared with someone who consistently operates from a high construal level. Thus, in accordance with Debusscher et al. (2016), I expected that high variance in construal level would suppress the relationship of average construal level with creative performance.

Hypothesis 21a: Within-person variability in individual construal level, measured with the PSYDIS, will significantly moderate the relationship between construal level and creativity, such that the relationship will be weaker when variability is high.

Hypothesis 21b: Within-person variability in individual construal level, measured with

the BIF, will significantly moderate the relationship between construal level and creativity, such that the relationship will be weaker when variability is high.

Detail Orientation. As described under Study 2's introduction, concerning oneself with secondary, concrete details is a definitional feature of low construal level. A person who is typically more concrete in their construal level should, somewhat by definition, also be typically more detail-oriented. Thus, I expect average construal level (measured with either the PSYDIS or the BIF) to exhibit a significant, negative relationship with detail orientation.

Hypothesis 22a: Average construal level, measured with the PSYDIS, will show a significant, negative correlation with detail orientation.

Hypothesis 22b: Average construal level, measured with the BIF, will show a significant, negative correlation with detail orientation.

For the reasons described above, I again expected that variability in construal level would suppress relationships between construal level and outcomes. Thus, I expect that the relationship between low construal level and detail-orientation will be weaker when variability in construal level is high.

Hypothesis 23a: Variability in individual construal level (measured with the PSYDIS) will significantly moderate the relationship between average construal level and detail

orientation, such that the relationship between average construal level and detail-orientation will be weaker when variability in construal level is higher.

Hypothesis 23b: Variability in individual construal level (measured with the BIF) will significantly moderate the relationship between average construal level and detail orientation, such that the relationship between average construal level and detail-orientation will be weaker when variability in construal level is higher.

Additional Work Outcomes

Study 2 (Hypotheses 9–12) expected predictive relationships between dimensions of construal level and several work-related outcomes. These included Organizational Citizenship Behaviors, visioning behaviors, task urgency, and preference for remote work. These were also included in Study 3 to test whether construal level overall and the dimensions-specific subscales of the PSYDIS may predict differently when using average scores versus single-point scores.

Outcomes of Construal Flux

In the above hypotheses, variability has a negative connotation: it suppresses the expected relationships. However, variability in construal level could have highly desirable work-related consequences as well. As noted above, both high and low construal levels have unique strengths and weaknesses. In some contexts, there is a 'winner', where one level is associated with a broadly desirable outcome, and the other with a broadly undesirable outcome. For example, high construal levels are associated with less unhealthy rumination in Post-Traumatic Stress Disorder (PTSD), and lower construal levels are associated with more rumination,

reinforcing the idea that zooming out to 'get perspective' can help with coping (Siedlecka et al., 2015).

However, high and low construal levels often have contrasting strengths, with no clear 'winner'. In these cases, it becomes clear that choosing the appropriate construal level for the context is more effective than either high or low. Depending on the task or situation, it may be most effective to think analytically (low construal) or creatively (high construal), to pay attention to situational factors (low construal) or draw insight from outside the situation (high construal), to plan for the near future (low construal) or the far future (high construal), to focus on survival (low construal) or think about what the ideal 'perfect' goal would be at a high construal (Liberman et al., 2012; Rasmussen, n.d.; White, 2015). Each of these presents two strengths that could be valued more or less depending on the needs of the moment.

Matching the best-suited construal level to the task at hand — sometimes termed *construal fit* — has been shown to have its own positive outcomes. Matching one's construal level of a stranger with the construal level at which that stranger views themselves can lead to more accurate empathy (Berson et al., 2014; Eyal & Epley, 2010). Matching the framing of a leader's communications to their audience of followers based on how socially distant those followers are may help that communication be more well received (Berson et al., 2015). Matching sales pitches to the stress levels of customers (stress drives construal level more concrete) is associated with greater willingness on the customer's part to spend more money (Maier & Wilken, 2014).

Job Performance. Both high and low construal levels are useful in different aspects of the workplace, and it is possible that being able to efficiently switch between the two processing frames results in better overall work performance. In individual difference terms, some people

may be better able to switch their construal than others who are more 'stable' in their construal level. This may appear as individual differences in total variability of construal level. With other constructs in organizational psychology, this type of variability has been termed 'flux' (Dalal et al., 2020). Hence, while I expected in the previous hypotheses that construal flux would suppress the relationship between construal level and certain domains of performance (i.e., creativity), I expected in the following hypotheses that construal flux would positively predict overall work performance, such that greater construal flux will be associated with higher overall job performance.

Hypothesis 24a: Within-person variability in individual construal level, measured with the PSYDIS, will be significantly and positively related to overall job performance.

Hypothesis 24b: Within-person variability in individual construal level, measured with the BIF, will be significantly and positively related to overall job performance.

Innovation. Wiesenfeld et al. (2017) suggested that high and low construal level are related to vision and execution in the workplace. High construal is associated with many vision-related constructs such as creativity, novelty, meaning, openness, and a focus on broader goals and values versus conventional rules and standards (Levesque, 2012; Liberman et al., 2012; Trope & Liberman, 2010; Wetherell, 2015). Low construal level is related to execution-related constructs like focusing on the short-term, on concrete goals, and on realistic obstacles to goal attainment (Labroo & Patrick, 2008; White, 2015). Innovation is one outcome that is potentially related to both vision and execution. Scott and Bruce (1994) noted that a key distinction between

creativity and innovation is that while creativity is related to generating novel ideas, innovation requires both generating the ideas and producing them. Considering this definition, it seems as though a person with highly fluctuating construal level would be adept at both generating and producing novel ideas.

Hypothesis 25a: Within-person variability in individual construal level, measured with the PSYDIS, will be significantly and positively related to performing innovative behaviors.

Hypothesis 25b: Within-person variability in individual construal level, measured with the BIF, will be significantly and positively related to performing innovative behaviors.

Methods

I used the PSYDIS and BIF measures to capture distributions of daily construal levels in a sample of participants. In brief, participants were asked to complete daily measures of construal level across a workweek, and then completed an end-of-week survey that included outcome measures (creativity, detail orientation, OCBs, task urgency, preference for remote work, visioning, overall job performance, and innovation). The daily survey data was used to compute averages of both construal level and variance in construal level for each participant, which were tested against the outcome measures collected on the final day's survey.

Sample Characteristics

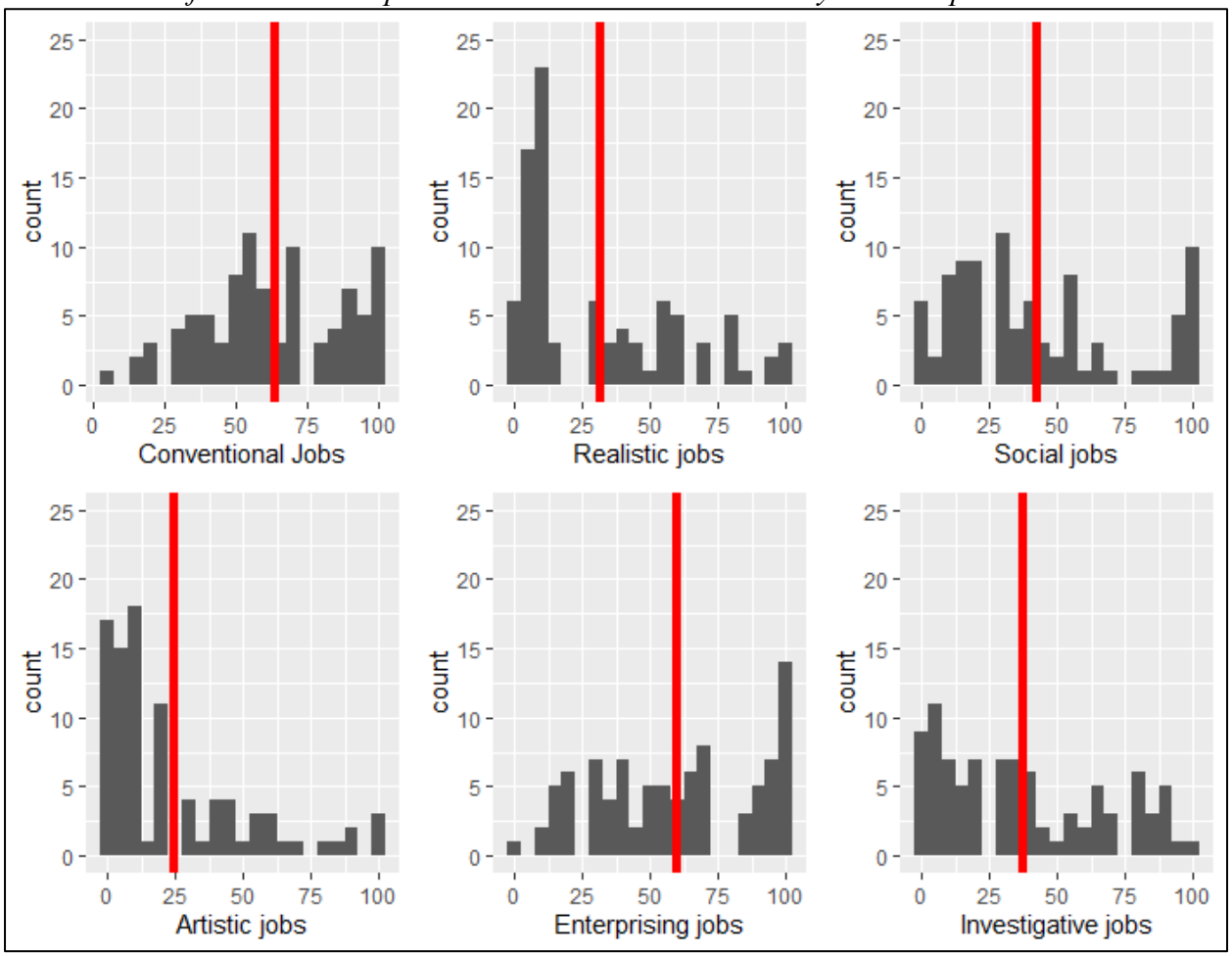
An initial sample of 325 English-speaking, full-time US workers was collected from Prolific online data collection service. Participants ranged in age from 18-years-old to 73-years-old, with an average age of 34.4. Two participants were dropped for missing some data (listwise deletion). Seventeen participants were dropped for failing any of five attention check items across the study (discussed below and listed in Appendices). From the remaining participants, 307 participants completed the day 1 survey, 230 participants completed the day 2 survey, 167 completed day 3, 145 completed day 4, and 117 completed all time points. This equated to an overall attrition rate of 62%.

Best practices in attrition minimization, as sourced from both Prolific's documentation and at least one subject matter expert in Experience Sampling, were applied to the study design to minimize attrition between time points (Evernden, 2018; K. Merlo personal communication, May 1st, 2020). These practices included clearly communicating the structure of the study to participants and 'back-loading' the payment structure such that participants were paid at a higher rate for the final study. Participants were paid $1.25 for each of the first four daily surveys, which took an average of 9.15 minutes to complete (equivalent to about $8.20/hour), and $5 for the final, fifth survey, which took an average of 10.7 minutes to complete (equivalent to about $28.04/hour).

The final sample of n = 117 completers is in line with power analysis, which determined that a sample size of n=114 participants should be sufficient to detect a small to moderate effect, using commonly accepted cutoffs (alpha = .05, power = .80). This power analysis was based on my most 'expensive' hypotheses (i.e., the hypotheses that stipulated that variability in construal level would interact with construal-outcome relationships).

Participant Jobs. As in Study 2, participants provided the O*Net occupation code associated with their job. These codes were passed to O*Net's web services API and used to retrieve occupational interest scores for each provided job. A summary of occupational interests common to study 3 participants' jobs can be seen in Figure 4. A more detailed discussion of these interest scores and their relationships with study variables can be found in the Supplementary Analysis section.

Figure 4:
Distributions of RIASEC Occupational Interests Relevant to Study 3 Participants' Jobs



Note. Each chart shows the frequency of a particular score for that interest from 0-100, in 5-point-wide buckets. For example, ten participants worked in jobs that scored between 95-100 on Conventionality.

Survey Timing and Measures

Participants completed a daily survey over a 5-day workweek, capturing their daily construal level. On Friday, at the end of their workweek, participants completed a final survey aimed at capturing their creativity, detail orientation, organizational citizenship behaviors, preference for remote work, task urgency, and visioning behaviors — as well as their overall job performance and innovation for the week. Recall here that I assessed the relationship between patterns of construal level (average and variance) and outcomes between-person. I collected and calculated the average during the week, and then collected the outcomes at the end.

Construal Level. Daily construal level was assessed using both the PSYDIS scale developed for this study and the BIF. The final version of the PSYDIS contained 16 items, formatted as a semantic-differential scale where participants chose a point on a 5-point scale between high and low poles. An additional, new item "I feel like I want to be in a... Cozy space / Big, vast space" was added to the PSYDIS' under-performing physical distance subscale after study 2 in an attempt to improve that subscale. The BIF contained 25 items. Average construal level was operationalized, separately, as either the average total score on the BIF across time points for a given participant, or as the average total score on the PSYDIS across time points for a given participant. For each of the hypotheses involving average construal level, average CL using the BIF and also using the PSYDIS were tested in parallel. Alpha reliabilities for the BIF, PSYDIS, and the subscales of the PSYDIS can be seen in Table 33.

Table 33:
Alpha Reliability Coefficients or the BIF, PSYDIS, and Subscales Over the Five Time-Points of Study 3 (And in Total)

	T1	T2	T3	T4	T5	Overall	Omega
BIF	.88	.90	.91	.90	.91	.90	.91
PSYDIS	.83	.85	.84	.86	.87	.85	.90
Social	.84	.87	.86	.87	.88	.87	.91
Hypothetical	.80	.81	.80	.86	.87	.83	.88
Spatial	.46	.58	.48	.57	.52	.52	.71
Temporal	.84	.83	.85	.89	.89	.86	.91

Creativity. Creativity was assessed with the Biographical Inventory of Creative Behaviors (BICB), which asks test takers to identify which of a set of creative behaviors (e.g., drawing a picture, writing an article) they have engaged in in the last 12 months (Batey, 2007). This scale has shown medium-sized significant correlations with divergent thinking tasks and other measures of creativity. In a review and empirical test of creativity measures, Silvia et al. (2012) found that the BICB exhibited good alpha reliabilities between (.74-.78) in three different studies (note that here, in Study 3, it demonstrated a similar $\alpha = .71$). It also has a key advantage over a divergent thinking task (a more typical measure of creativity) in that it does not need to be administered in a physical setting with closely monitored, strict time constraints, which makes it a good fit for this online-based validation study. The total count of creative behaviors was taken as the measure of dispositional creativity.

Detail Orientation. Detail orientation was assessed using three items from the International Personality Item Pool (IPIP) that capture detail-oriented processing tendencies (Goldberg et al., 2006). These items are: “I am not likely to notice small visual details.”, “I tend to notice details that others do not.”, and “I pay attention to details.” The total score on this scale was taken as the measure of dispositional detail orientation. These items were sourced from different parent scales in the IPIP, which only lists the alpha for the scales containing the “I pay

attention to details" and "I have an eye for detail" items, which are listed as having moderate alpha reliabilities of α = .78 and α = .72, respectively (Goldberg et al., 2006; Tedone, 2021). In this study, the detail orientation scale showed a moderate alpha reliability of α = .67.

Overall Job Performance. Given that I was interested in testing a week-spanning pattern of construal fluctuations against job performance, I needed to assess job performance for the week overall. Asking participants to self-report their own job performance accurately is typically a difficult task, and in cases where self-report is preferred, B. Wiernick (personal communication, March 27th, 2020) recommends asking participants to rate their own job performance relative to their typical performance (Murphy, 2008).

Following this advice, participants were asked to rate their own performance for the week using the following question: "Compared to your typical level, how would you rate your overall job performance this week?" Ratings were provided on a 5-point scale (1 = Much lower job performance than usual, 2 = A little lower job performance than usual, 3 = About the same job performance as usual, 4 = A little higher job performance than usual, 5 = Much higher job performance than usual).

Innovation. Innovation was measured with Welbourne et al.'s (1998) 4-item innovator role scale. Designed to assess the degree to which an individual engages in organization-relevant creativity, Welbourne et al. (1998) showed that this scale demonstrated excellent internal reliability (α = .90), which it also maintained here in my Study 3 (α = .91). It asks participants to rate their performance during the week on four dimensions including "Coming up with new ideas" and "Working to implement new ideas", from "Needs much improvement" to "Excellent." Note that an error was noticed after data collection in which the anchor points were listed for participants on a 7-point scale as "Needs much improvement, untrue of me, somewhat untrue of

me, neutral, somewhat true of me, true of me, and very true of me." This did not seem to affect the reliability, as it still demonstrated excellent alpha reliability (α = .91), which was in line with the scale's originally-reported reliability in Welbourne et al. (1998). The innovation scale here also demonstrated a sizable, significant correlation with visioning (r = .41***, p < .001), which one would expect given the theoretical overlap between the constructs (discussed above).

Additional Work Outcomes. As in Study 2, interpersonal-focused organizational citizenship behaviors were measured with an interpersonally-focused subset of items from Spector et al.'s (2010) Organizational Citizenship Behavior Checklist (α =.80–.86 for the full scale in previous studies; α = .85 in the present study). Visioning was again measured with a single item modified from De Vries's (2004) Global Executive Leadership Inventory (which demonstrated a reliability of omega = .88 for the full leadership inventory, but an alpha estimate could not be obtained for this single item). Task urgency was again measured with the six 'task-related hurry' items from Landy et al.'s (1991) comprehensive time urgency measure (which previously demonstrated a reliability of α = .72, and here achieved α = .91). Finally, preference for remote work was measured with the single-item measure (alpha reliability not available) based on the telework study and items by Peters et al. (2004).

Variable Scoring and Calculation

Individual differences in construal level were operationalized as each participant's average construal level over the 5-day period of the study, in accordance with the method of measuring traits proposed by Fleeson and Jayawickreme (2015). Means were calculated for each participant on the total score of both the PSYDIS and BIF (separately).

Construal Flux. Each participant's variability in construal level throughout the week was stored in two variables (one for the PSYDIS, one for the BIF). The literature offers several

different ways to operationalize variance as an individual difference (Dalal et al., 2020). It can be operationalized as the difference between people's peak and valley (i.e., how widely it fluctuates). Or as the skewness of their within-person distribution of construal levels. Or the total variability of their distribution. This last is called "flux."

Given that it is the total amount of 'switching' construal levels that is of interest in my hypotheses (for example, for creating successful work performance), I chose within-person standard deviation (flux) as my operationalization of choice. Construal flux was represented as the standard deviation of a participant's within-person construal level (as measured by the total score on the PSYDIS or BIF), in accordance with Dalal et al. (2020).

Between-Person Variance of Construal Level

To test whether there was significant between-person variance in construal level (as per Hypotheses 19a/b, I employed an Interclass Correlation test (ICC). This test creates a ratio comparing the amount of variance found between-subjects, to the amount of variance found within-subjects. It results in a score between 0 and 1, with scores closer to 1 representing more between-person variance.

Hypothesis Testing

Hypotheses 20a/b and 22a/b state that the average construal level will be significantly and positively related to creativity, and negatively related to detail orientation. Hypotheses 24a/b and 25a/b suggested that construal flux (variability in construal level) would be positively related to overall job performance and innovation, respectively. Further, Hypotheses 9b–12b suggested that (average) social distance, hypotheticality distance, temporal distance, and spatial distance would be related to OCBs, visioning, task urgency, and preference for remote work. All of these

simple predictor-outcome relationships were tested with a Pearson correlation test, with a significance threshold of alpha=.05.

Hypotheses 21a/b and 23a/b suggested that construal flux would moderate the effect of construal level on creative performance and detail orientation. To test the moderating effect of construal flux, a hierarchical regression was performed to test for a significant interaction effect of construal flux on the relationship between average construal level and creative performance. A second regression was performed to test for a significant interaction effect of construal flux on the relationship between average construal level and detail-oriented task performance.

Results

Alpha reliabilities for all scales can be found in Table 35. As in Study 2, most scales demonstrated acceptable alpha reliability, with the exception of the physical distance subscale of the PSYDIS ($\alpha = .52$). Hypotheses 19a and 19b proposed that the between-person differences in construal level would be larger than the within-person differences, suggesting that stable 'set points' in construal level exist. Using the BIF (Hypothesis 19b), this hypothesis was supported. A test of inter-class correlation revealed an excellent ICC1 value of .91 ($F [116,468] = 53$, $p < .001$), indicating a considerable tilt towards between-person variance over within-person variance. This means that 91% of the variance is between-person, and approximately 9% of the variance is within-person variance or error variance. Using the PSYDIS, this hypothesis (19a) was again supported, as the PSYDIS showed good (.79) interclass-correlations. This pattern held for the dimensions of the PSYDIS as well, as each showed at least a moderate, significant tilt towards between-person variance over within person variance. Descriptive statistics and ICC1 values for the BIF, PSYDIS, and the dimensions of the PSYDIS can be seen in Tables 34, 35,

and 36. This adds empirical support for Vallacher and Wegner's (1989) contention that there are stable differences in abstract and concrete processing of actions.

Table 34:
Inter-Class Correlation Coefficients for Each Measure of Construal Level Across the 5-Day Study

Scale	ICC1	F(116, 468)	p value
BIF	.91	F = 53***	p < .001
PSYDIS	.79	F = 19***	p < .001
PSYDIS – Social	.81	F = 22***	p < .001
PSYDIS - Hypothetical	.74	F = 15***	p < .001
PSYDIS - Physical	.71	F = 13***	p < .001
PSYDIS - Temporal	.66	F = 11***	p < .001

Table 35:
Alpha Reliabilities of All Study 3 Measures

Measure	Alpha
BIF	.90
PSYDIS	.85
PSYDIS-Social	.87
PSYDIS-Temporal	.86
PSYDIS-Hypo	.83
PSYDIS-Spatial	.52
Innovation	.91
Task Urgency	.91
Avoidance Mo.	.92
Detail Orientation	.67
OCBs	.85
BICB	.71

Table 36:
Descriptive Statistics for BIF and PSYDIS Measures

	BIF	PSYDIS
Minimum	25	19
Maximum	50	67
Mean	38.56	38.84
Median	39	38
SD	6.50	9.21

Table 37:

Means, Standard Deviations, and Correlations for All Study 3 Measures

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10
1. Avg BIF	38.56	6.28										
2. Avg PSYDIS	38.85	8.41	-.12									
3. Avg PSYDIS-Social	12.80	3.68	-.32**	.72**								
4. Avg PSYDIS-Hypo	10.24	3.30	-.02	.84**	.44**							
5. Avg PSYDIS-Spatial	7.32	2.05	.04	.45**	.04	.24**						
6. Avg PSYDIS-Temporal	8.49	2.68	.05	.77**	.30**	.62**	.31**					
7. CL Flux	1.56	1.16	-.11	.05	.11	.09	-.11	-.02				
8. PSYDIS Flux	3.54	2.40	-.09	.07	.03	.17	-.03	-.00	.31**			
9. PSYDIS Flux-Social	1.51	0.92	-.21*	.02	-.01	.11	-.12	.03	.21*	.59**		
10. PSYDIS Flux-Hypo	1.54	1.08	-.03	.04	.13	.02	-.01	-.08	.28**	.70**	.30**	
11. PSYDIS Flux-Spatial	1.00	0.75	-.01	.10	-.01	.09	.21*	.05	.25**	.60**	.47**	.50**
12. PSYDIS Flux-Temporal	1.52	1.05	-.04	.15	.14	.18	.01	.03	.33**	.77**	.39**	.49**
13. Visioning	3.28	0.75	.20*	-.08	-.23*	-.03	.14	-.01	-.03	.09	-.01	.15
14. Innovation	17.93	4.97	.17	-.23*	-.33**	-.18	.06	-.08	-.02	-.09	.00	-.19*
15. Remote Work	5.11	2.14	-.01	.12	.15	.06	.11	-.00	.11	.08	-.01	.21*
16. Avoidance Mo.	24.72	7.12	-.25**	.22*	.26**	.27**	-.12	.08	.03	.07	.09	.02
17. Detail Orient.	15.43	2.73	.10	-.03	-.00	-.00	.11	-.17	-.07	-.04	-.03	.05
18. Task Urgency	27.94	7.27	.11	-.16	-.17	-.16	-.04	-.04	-.02	-.03	.14	-.03
19. BICB	4.74	3.23	.03	.17	.12	.15	.14	.09	.07	.02	.06	.02
20. Job Perf.	3.12	0.72	.13	-.25**	-.24**	-.16	-.13	-.16	.04	.00	.04	-.05

Table 37 (cont'd)

Variable	11	12	13	14	15	16	17	18	19
1. Avg BIF									
2. Avg PSYDIS									
3. Avg PSYDIS-Social									
4. Avg PSYDIS-Hypo									
5. Avg PSYDIS-Spatial									
6. Avg PSYDIS-Temporal									
7. CL Flux									
8. PSYDIS Flux									
9. PSYDIS Flux-Social									
10. PSYDIS Flux-Hypo									
11. PSYDIS Flux-Spatial									
12. PSYDIS Flux-Temporal	.45**								
13. Visioning	.19*	.06							
14. Innovation	.00	-.18	.41**						
15. Remote Work	.13	.06	.02	.01					
16. Avoidance Mo.	-.10	.17	-.38**	-.37**	.27**				
17. Detail Orient.	-.02	-.02	.26**	.09	.25**	.12			
18. Task Urgency	-.06	-.07	.24**	.25**	-.22*	-.36**	-.02		
19. BICB	.11	.12	.32**	.26**	-.04	-.08	.11	.23*	
20. Job Perf.	-.15	-.03	.16	.41**	-.11	-.16	-.01	.25**	.09

Construal Level and Individual Differences

Hypotheses 20a/b and 22a/b posited relationships between average construal level and two individual difference variables: creativity and detail orientation. Hypotheses 21a/b and 23a/b further suggested that variance in construal level (construal flux) would moderate (dampen) these relationships. None of these hypotheses were supported.

Creativity. The BICB creativity measure exhibited acceptable internal reliability (alpha = .71) that was consistent with its reliability in previous studies. The correlation between a person's average PSYDIS score and creativity ($r = .17$, $p = .06$) was stronger than the correlation between average BIF and creativity ($r = .03$, $p = .74$), but neither of these were significant. Likewise, neither of the hypothesized moderation effects on creativity were found. Construal flux did not moderate the effect of construal on creativity, regardless of whether construal level was measured with the PSYDIS or with the BIF (see Tables 38 and 39).

At the subdimension level, three of the four subscales of the PSYDIS failed to show significant relationships with creativity (flux relationships were also non-significant for all of these). However, the social distance dimension behaved in support of this construal flux hypothesis. Greater social distance and greater flux in social distance were both significantly associated with higher creativity. However, there was a significant, negative interaction between average social distance and social distance flux, suggesting that fluctuation in social distance significantly and negatively moderated (attenuated) the relationship between social distance and creativity (see Table 40). Simple slopes analysis revealed an apparent change in the direction of the relationship between social distance and creativity when flux was low versus high (see Figure 5). However, significance testing of the simple slopes (see Table 41) revealed that only the low-flux relationship between social distance and creativity was significant, further supporting the

notion that greater variability (flux) attenuated the strength of the relationship between social distance and creativity.

Figure 5:
Simple Slopes Analysis Showing the Effect of Average Social Distance on Creativity, Moderated by High, Average, or Low Fluctuation in Social Distance

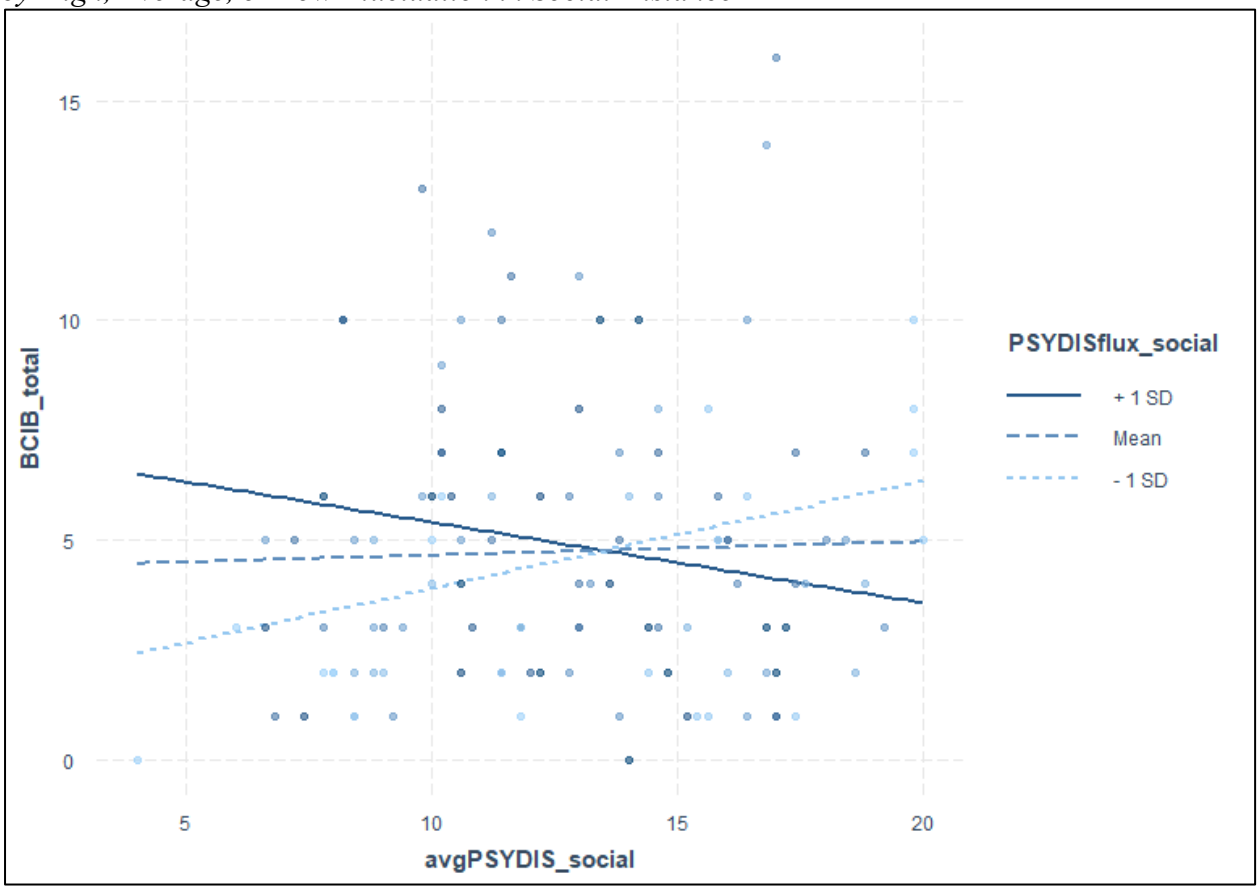


Table 38:

Regression Results Using Creativity as the Criterion and BIF-Based CL Flux as the Second Predictor After Construal Level

	b	*Std. Error*	*t*	*p*	Fit
(Intercept)	6.43*	2.91	2.21	0.029*	
Average CL (BIF)	-0.05	0.07	-0.72	0.473	
CL Flux (BIF)	-2.12	1.82	-1.16	0.247	
Avg CL:CL Flux	0.06	0.05	1.29	0.201	
					R^2 = -.01

* indicates $p < .05$. ** indicates $p < .01$.

Table 39:

Regression Results Using Creativity as the Criterion and PSYDIS-Based CL Flux as the Second Predictor After Construal Level

	b	*Std. Error*	*t*	*p*	Fit
(Intercept)	-1.95	2.78	-0.70	0.484	
Avg PSYDIS	0.17*	0.07	2.43	0.017*	
PSYDIS Flux	1.34	0.80	1.71	0.091	
Avg PSYDIS:PSYDIS Flux	-0.03	0.02	-1.72	0.089	
					R^2 = .03

* indicates $p < .05$. ** indicates $p < .01$.

Table 40:

Regression Results Using Creativity as the Criterion, and Average and Flux of Each Dimension as the Predictors

Predictor	*b*	*b* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	Fit
(Intercept)	-2.34	[-8.27, 3.59]			
Social Distance	0.33*	[0.02, 0.64]	.04	[-.03, .11]	
Social Distance (Flux)	2.80*	[0.03, 5.58]	.03	[-.03, .10]	
Hypothetical Distance	0.15	[-0.20, 0.51]	.01	[-.02, .03]	
Hypothetical Distance (Flux)	0.63	[-2.04, 3.29]	.00	[-.01, .02]	
Physical Distance	-0.06	[-0.55, 0.43]	.00	[-.01, .01]	
Physical Distance (Flux)	-1.18	[-4.69, 2.32]	.00	[-.02, .02]	
Temporal Distance	0.17	[-0.25, 0.59]	.01	[-.02, .03]	
Temporal Distance (Flux)	1.01	[-1.55, 3.57]	.01	[-.02, .03]	
Social Distance* Social Distance (Flux)	-0.21*	[-0.41, -0.00]	.03	[-.03, .10]	
Hypothetical * Hypothetical (Flux)	-0.09	[-0.34, 0.16]	.00	[-.02, .03]	
Physical Distance * Physical Distance (Flux)	0.18	[-0.23, 0.59]	.01	[-.02, .03]	
Temporal Distance * Temporal Distance (Flux)	-0.10	[-0.40, 0.21]	.00	[-.02, .02]	
					R^2 = .111
					95% CI[.00,.13]

Note. A significant *b*-weight indicates the semi-partial correlation is also significant. *b* represents unstandardized regression weights. sr^2 represents the semi-partial correlation squared. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.

* indicates p < .05. ** indicates p < .01.

Table 41:
Simple Slopes Analysis of Social Distance Regressed on Creativity, at +/- 1 SD of Social Distance Flux

	b	*Std. Error*	*t*	*p*	Fit
Social Distance at Flux (-1 SD)	0.25*	0.10	2.53	0.01	
Social Distance at Flux (Mean)	0.03	0.08	0.36	0.72	
Social Distance at Flux (+1 SD)	-0.18	0.14	-1.35	0.18	

* indicates $p < .05$. ** indicates $p < .01$.

Table 42:
Means, Standard Deviations, and Correlations Between Creativity and Construal Level (Measured With the BIF, the PSYDIS, and the Subscales of the PSYDIS)

Variable	*M*	*SD*	1	2	3	4	5	6
1. BICB	4.74	3.23						
2. Avg BIF	38.56	6.28	.03					
3. Avg PSYDIS	38.85	8.41	.17	-.12				
4. Avg PSYDIS-Hypo	10.24	3.30	.15	-.02	.84**			
5. Avg PSYDIS-Spatial	7.32	2.05	.14	.04	.45**	.24**		
6. Avg PSYDIS-Social	12.80	3.68	.12	-.32**	.72**	.44**	.04	
7. Avg PSYDIS-Temporal	8.49	2.68	.09	.05	.77**	.62**	.31**	.30**

Note. M and *SD* are used to represent mean and standard deviation, respectively.

* indicates $p < .05$. ** indicates $p < .01$.

Detail Orientation. Average construal level did not show a significant relationship with detail orientation, whether measured with the PSYDIS (r = -.03, p = .76) or the BIF (r = .10, p = .30). Additionally, fluctuation in construal level also did not significantly moderate the relationship between construal level and detail orientation, using either the PSYDIS or the BIF (see Tables 43 and 44). No subscales significantly predicted detail orientation, and no subscale flux interactions were significant (see Table 45).

Table 43:

Regression Results Using Detail Orientation as the Criterion, and Average BIF Score as the Predictor

Predictor	*b*	*b* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	Fit
(Intercept)	14.86**	[9.98, 19.74]			
Avg CL	0.02	[-0.11, 0.15]	.00	[-.01, .01]	
CL Flux	-0.75	[-3.81, 2.32]	.00	[-.01, .02]	
Avg CL* CL Flux	0.02	[-0.07, 0.10]	.00	[-.01, .01]	
					R^2 = .015 95% CI[.00,.06]

Note. A significant *b*-weight indicates the semi-partial correlation is also significant. *b* represents unstandardized regression weights. sr^2 represents the semi-partial correlation squared. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.
* indicates p < .05. ** indicates p < .01.

Table 44:

Regression Results Using Detail Orientation as the Criterion, and Average PSYDIS as the Predictor

Predictor	*b*	*b* 95% CI [LL, UL]	sr^2 95% CI [LL, UL]	Fit
(Intercept)	14.98**	[10.20, 19.76]		
Avg PSYDIS	0.02	[-0.11, 0.14]	[-.01, .01]	
PSYDIS Flux	0.26	[-1.09, 1.60]	[-.01, .01]	
Avg PSYDIS * PSYDIS Flux	-0.01	[-0.04, 0.03]	[-.01, .02]	
				R^2 = .004

Note. A significant *b*-weight indicates the semi-partial correlation is also significant. *b* represents unstandardized regression weights. sr^2 represents the semi-partial correlation squared. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.

Table 45:

Regression Results Using Detail Orientation as the Criterion, and Average and Flux scores for Each Dimension of the PSYDIS as the Predictor

Predictor	*b*	*b* 95% CI [LL, UL]	sr^2	sr^2 95% CI [LL, UL]	Fit
(Intercept)	13.74**	[8.67, 18.82]			
Social Distance	0.10	[-0.16, 0.37]	.01	[-.02, .03]	
Social Distance (Flux)	1.12	[-1.26, 3.49]	.01	[-.02, .04]	
Hypothetical Distance	0.13	[-0.17, 0.43]	.01	[-.02, .03]	
Hypothetical Distance (Flux)	0.14	[-2.15, 2.42]	.00	[-.00, .00]	
Physical Distance	0.17	[-0.25, 0.59]	.01	[-.02, .03]	
Physical Distance (Flux)	-1.00	[-4.00, 1.99]	.00	[-.02, .03]	
Temporal Distance	-0.23	[-0.59, 0.13]	.01	[-.03, .05]	
Temporal Distance (Flux)	0.34	[-1.85, 2.53]	.00	[-.01, .01]	
Social Distance* Social Distance (Flux)	-0.08	[-0.25, 0.10]	.01	[-.02, .03]	
Hypothetical * Hypothetical (Flux)	0.00	[-0.21, 0.22]	.00	[-.00, .00]	
Physical Distance * Physical Distance (Flux)	0.08	[-0.27, 0.43]	.00	[-.01, .02]	
Temporal Distance * Temporal Distance (Flux)	-0.06	[-0.32, 0.20]	.00	[-.01, .02]	
					R^2 = .091 95% CI[.00,.10]

Note. A significant *b*-weight indicates the semi-partial correlation is also significant. *b* represents unstandardized regression weights. sr^2 represents the semi-partial correlation squared. *LL* and *UL* indicate the lower and upper limits of a confidence interval, respectively.

* indicates p < .05. ** indicates p < .01.

Subscale Outcomes

I tested whether the average of each subscale of the PSYDIS (social distance, temporal distance, hypotheticality distance, and spatial distance) was able to predict a set of outcomes chosen to theoretically match each subdimension (OCBs, task urgency, visioning, and preference for remote work, respectively). These are variations on Hypotheses 9–12 using average construal level instead of single-measure construal level. Average social distance correlated significantly with OCBs ($r = -.19^*$, $p < .05$), which mirrors its relationship from Study 2's single-point assessment ($r = -.23^{***}$, $p < .001$). The remaining dimensions all failed to significantly correlate. Average temporal distance and task urgency was non-significant ($r = -.04$, $p = .64$), despite being significant and (as expected) negative in Study 2 ($r = -.18^{**}$, $p < .01$). Average hypotheticality distance and visioning was non-significant ($r = -.03$, $p = .77$), consistent with its single-point assessment in Study 2 ($r = .07$, $p = .24$). Finally, average spatial distance and preference for remote work was non-significant but in the expected direction ($r = .11$, $p = .25$), unlike in its single-point measurement in Study 2, which was significant but in the opposite of the expected direction ($r = -.14^*$, $p < .05$).

Overall, it seemed like the averaging may have diluted some relationships between subscales and outcomes (versus single-point measurement), except with physical distance, where the direction flipped as well. Although the study 3 relationship for spatial distance was not significant, its noticeable direction/significance flip could (speculatively) suggest that feeling physically distant for one moment could be associated with wanting less of that distant feeling, but feeling more distant on average may mean you prefer it that way.

Construal Flux Outcomes

Variation in construal level (CL flux) did not show a significant relationship with either job performance or innovation, regardless of which scale was used to produce the CL flux estimate. The relationship between CL Flux measured with the PSYDIS and job performance was not significant ($r = .00$, $p = .98$). The relationship between CL Flux measured with the BIF and job performance was not significant ($r = .04$, $p = .70$). The relationship between CL Flux measured with the PSYDIS and innovation was not significant ($r = -.09$, $p = .31$). The relationship between CL Flux measured with the BIF and innovation was not significant ($r = -.02$, $p = .85$).

At the subscale level, fluctuation in hypotheticality distance flux was negatively related to innovation ($r = -.19^*$, $p < .05$), which was the opposite of the expected direction. Fluctuation in the remaining three subscales of the PSYDIS was not significantly related to innovation nor job performance (see Table 46).

Table 46:

Means, Standard Deviations, and Correlations With Confidence Intervals

Variable	*M*	*SD*	1	2	3	4	5	6	7
1. Job Perf.	3.12	0.72							
2. Innovation	17.93	4.97	.41**						
3. CL Flux	1.56	1.16	.04	-.02					
4. PSYDIS Flux	3.54	2.40	.00	-.09	.31**				
5. PSYDIS Flux-Hypo	1.54	1.08	-.05	-.19*	.28**	.70**			
6. PSYDIS Flux-Spatial	1.00	0.75	-.15	.00	.25**	.60**	.50**		
7. PSYDIS Flux-Social	1.51	0.92	.04	.00	.21*	.59**	.30**	.47**	

Summary

The overarching purpose of Study 3 was to assess whether individual differences in construal level exist by the modern standards of the Whole Trait Theory approach advocated for by Fleeson (2004). To this end, the study was a success. With an excellent inter-class correlation of .91 across five days, it seems as though there are indeed stable construal level 'set points' between people, especially when measured with Vallacher and Wegner's (1989) Behavior Identification Form.

The secondary purpose of Study 3 was to test whether construal level set points could meaningfully predict work-related outcomes. This effort was unsuccessful, strictly in terms of the hypothesized outcome relationships. Average construal level across 5 days showed no significant relationship with creativity or detail orientation. Average social distance failed to correlate in the expected direction with OCBs. Average temporal distance and task urgency was non-significant. Average hypotheticality distance and visioning was non-significant, as was the relationship between average spatial distance and preference for remote work. Outside the hypothesized correlations, average construal level (BIF) was correlated significantly and in the expected direction with both visioning ($r = .20^*$, $p < .05$) and avoidance motivation ($-.25^{**}$, $p < .01$).

The third purpose of Study 3 was to test whether some people had greater fluctuations in their own construal level, and whether those fluctuations could meaningfully predict outcomes. This effort was unsuccessful, with one possible exception. It is clear from the data that some people range more in their daily construal level than others, however standard deviations were all relatively small, and that overall variance did not significantly predict any of the tested outcomes. More precisely, the CL flux distribution was positively skewed, suggesting that the

majority of participants had relatively little fluctuation in their construal level. The average construal flux (within-person standard deviation) score of SD = 1.56 was considerably lower than the SD = 6.50 observed standard deviation for the BIF itself across all participants and time-points. Here, the success of finding within-person stability in construal level may have been mutually exclusive to the goal of studying within-person fluctuations in construal level. The one exception to the non-predictiveness of construal flux was the ability of social distance flux to predict creativity above and beyond average social distance alone, and to suppress the relationship between average social distance and creativity.

Another purpose of Study 3 was to further test the relationship between the dimensional PSYDIS scale and outcomes of construal level, using average scores across five time points. The PSYDIS did show moderate within-person stability (ICC1 = .79). Otherwise, these hypotheses were not supported, with the possible exception of average social distance, which showed a significant relationship with its tested outcome (Organizational Citizenship Behaviors), but in the opposite direction. Ultimately, no subscale hypotheses were supported. The averaging of the subscale scores across time seemed to wash out any predictive relationships observed in study 2, except for the social distance scale, which seemed strong enough to sustain the relationships observed with it in study 2 even across time.

Supplementary Analysis

A number of ancillary questions arose in response to the results of Study 3. To help answer these questions, additional analyses were conducted. In the following sections, I will describe both the ancillary questions, how I sought to answer them, and the results of those efforts.

Did Time of Day Affect Construal Level? Surveys were released between 11am–1pm EST each day of the study, with the majority of surveys released at exactly 12pm EST, and were generally 'closed' between 4pm–8pm EST. However, participants completed the surveys at different times within that window. Additionally, although participants were all current United States (US) residents, differing local time zones (including Hawaii) resulted in different localized survey completion times ranging from 6am to 8pm. It occurred to me that time of day could bring different psychological distance-triggering stimuli (e.g., one may be surrounded by people during the day, then alone in the evening). In light of this consideration, I analyzed the effect of time of day on construal level using hierarchical linear modeling (HLM).

For each daily survey, completion time was converted to that participant's local time, retaining only the hour of the day on a 24-hour clock, then person-mean-centered (so a person's time score was their deviation, earlier or later, from the average time they took surveys). The effect of hour of day on construal level (total score on the BIF) was entered with centered hour of day nested within participant. Given the observed between-person variance in 'baseline' average construal level, participant intercepts and slopes were treated as random effects and allowed to vary. Hierarchical regression analysis (shown in Table 47) indicated that time of day was not a significant predictor of construal level. This suggest that, for a given individual, completing the survey earlier or later did not affect their construal level.

Table 47:
Results of HLM Model Testing the Effect of Hour of Day on Construal Level, With Hour of Day Nested Within Participant

		BIF	
Predictors	*Estimates*	*CI*	*p*
(Intercept)	38.56	37.42 – 39.70	**<0.001**
Hour of Day	0.05	-0.07 – 0.16	0.424
Random Effects			
σ^2	3.65		
$\tau_{00\ prolific\_id}$	38.73		
$\tau_{11\ prolific\_id.time\_centered}$	0.04		
$\rho_{01\ prolific\_id}$	-0.56		
ICC	0.91		
$N_{prolific\_id}$	117		
Observations	585		
Marginal R^2 / Conditional R^2	0.000 / 0.914		

Would Operationalizing Construal Flux Differently Have Changed the Results? In this study, I operationalized variation in construal level as the standard deviation of within-person construal level scores (construal flux). Recall from the introduction that Dalal et al. (2020) suggested several different ways that within-person variation in a construct can be summarized. Specifically, Dalal et al. (2020) also proposed that the range of scores (the maximum minus the minimum) could be used to summarize within-person variation. To investigate this, I tested whether 'construal range' might have performed differently in some of the construal flux hypotheses. It did not. Like Construal Flux, Construal Range failed to show a significant relationship with either job performance (r = .03, p = .74) or innovation (r = -.01, p = .88).

Did Occupation Type Affect Average Construal Level or Construal Flux? It is possible that different job types may require more typically abstract or concrete processing (or attract more abstract or concrete people). For example, Schimmel and Forster (2008) found that higher construal levels were related to greater affinity for abstract art versus conventional art. Their results suggest that even within a community of artists, abstract artists may exhibit a more abstract average construal level. Similarly, the focus on pragmatic 'how' questions common to concrete construal level could lend itself to more realistic jobs. Tables 48 and 49 show the correlations between participants' occupational interest scores in Study 2 and Study 3 (i.e., the extent to which the job code they provided was associated with realistic, investigative, artistic, social, enterprising, and conventional interests).

Table 48:

Correlations Between Measures of Construal Level and Occupational Interest Scores Derived From Job Titles (Study 2)

Variable	1	2	3	4	5	6	7	8	9	10	11
1. BIF											
2. PSYDIS	-.05										
3. PD - Social Distance	-.21**	.58**									
4. PD - Hypothetical	-.03	.77**	.25**								
5. PD - Physical	.01	.52**	-.05	.26**							
6. PD – Temporal	.13	.74**	.20**	.46**	.35**						
7. Conventional	.15*	-.12	.03	-.17*	-.14*	-.05					
8. Realistic	-.13	-.10	.01	-.08	-.09	-.12	-.11				
9. Social	-.05	.07	-.08	.10	.10	.08	-.07	-.40**			
10. Artistic	-.14*	.10	.02	.23**	.03	-.03	-.58**	-.16*	.17*		
11. Enterprising	.17*	.07	-.03	.01	.13	.10	.07	-.57**	.09	-.13	
12. Investigative	-.07	-.08	-.11	-.02	-.03	-.04	-.08	.17*	-.14*	.13	-.51**

* indicates $p < .05$. ** indicates $p < .01$.

Table 49:

Correlations Between Measures of Construal Level and Occupational Interest Scores Derived From Job Titles (Study 3)

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12
1. Avg BIF	38.69	6.06												
2. Avg PSYDIS	39.33	8.14	-.05											
3. Avg PSYDIS-Hypo	10.50	3.39	.04	.86**										
4. Avg PSYDIS-Spatial	7.26	1.98	.09	.39**	.23*									
5. Avg PSYDIS-Social	12.91	3.63	-.29**	.70**	.43**	-.03								
6. Avg PSYDIS-Temporal	8.66	2.57	.13	.75**	.61**	.21*	.28**							
7. CL Flux	1.65	1.23	-.04	.02	.06	-.12	.10	-.05						
8. Conventional	63.15	24.64	-.03	-.15	-.21*	.01	-.12	-.04	-.22*					
9. Realistic	31.12	29.32	-.09	-.06	-.04	-.14	.08	-.15	.05	.01				
10. Social	42.43	31.74	-.05	.07	.03	-.04	.09	.07	.04	-.39**	-.19			
11. Artistic	24.25	26.83	-.01	.19	.15	.03	.18	.11	.09	-.65**	-.23*	.29**		
12. Enterprising	59.73	29.56	.05	.03	.08	.07	-.04	-.00	-.04	.01	-.37**	-.24*	-.10	
13. Investigative	37.22	29.79	-.04	.00	.01	.02	-.03	.01	.03	-.22*	-.03	-.11	.07	-.39**

Note. M and *SD* are used to represent mean and standard deviation, respectively.

* indicates $p < .05$. ** indicates $p < .01$

Results of this analysis for Study 2 showed that construal level measured with the BIF was significantly and negatively associated with artistic jobs (e.g., graphic designer, writer), and positively associated with conventional (e.g., Administrative Assistant) and enterprising jobs (e.g., manager). The positive association with enterprising jobs has some connection to previous work suggesting a positive relationship between construal level and leadership positions (Magee & Smith, 2013; Smith & Trope, 2006). However, the negative association with artistic jobs and positive association with conventional jobs is counter to expectations. One possible explanation is that to an abstract-minded artist, having to complete concrete art work daily (e.g., for clients and deadlines) puts their mind in a more concrete state. For the conventional association, it is possible that conventional jobs like data entry may be able to be completed fairly automatically, or with lots of breaks in between, allowing their minds to float up into abstraction. However, none of these relationships held for study 3, when average construal level was correlated with job interests instead of single-point BIF score.

Although the overall score on the PSYDIS scale did not show any significant relationships with occupational interests across the two studies, the Hypotheticality dimension showed a significant, negative relationship with conventional job types in both studies; it also demonstrated a positive correlation with artistic job types, but that relationship was only significant in Study 2.

General Discussion

The primary goal of this study was to test whether people have different, meaningfully stable levels of construal, sufficient to qualify construal level as an individual difference variable. In this, the study was a success. According to the results of this study, construal level qualifies as an individual difference by the modern standards proposed by Fleeson and Jayawickreme's (2015) Whole Trait Theory. Measured with the standard Behavior Identification Form, construal level exhibited excellent within-person stability over 5 daily observations. What remains unknown however is what utility and consequence this stability has. I suggested at the beginning of this study that a person who has a higher or lower construal 'set point' should have observably different tendencies and behaviors. This study found that a higher average construal level was significantly related to more visioning behaviors, and lower average construal level was related to more avoidance motivation. Although many other outcomes failed to show significant relationships, that there were at least two significant predictive relationships that were both theoretically consistent with construal level theory offers some initial promise. It offers some evidence that individuals with higher or lower average construal level may typically perform differently on valued out comes like visioning and motivation, and establishes some potential that further research could reveal more outcomes of average construal level.

Lessons from the Development of the Psychological Distance Scale

The newly developed Psychological Distance Scale was to my knowledge the first attempt to measure the dimensions of psychological distance independently in a generalizable way. Although its structure was acceptable (with the intended 4-factor structure and mostly good internal reliability), it did not pass the majority of its validity checks. It showed no relationships with other measures of construal level. Further, it behaved inconsistently in its predictive validity

tests. It showed a significant relationship with some outcome variables in the expected direction (e.g., a positive relationship with risk taking and a negative relationship with task urgency), but also showed significant relationships with other outcomes in the opposite of the expected direction (e.g., a negative relationship with openness and creative performance). However, for all the PSYDIS' failings, it did at least break ground on attempting to measure the psychological distance dimensions independently in a generalizable scale.

Measuring Social Distance

Of particular interest, the social distance dimension of the PSYDIS seems worthy of further development. It showed a significant relationship with all existing measures of construal level, and with innovation and avoidance motivation. Across all studies, it was the most consistent scale, in that it had more significant relationships in the same direction than any other subscale. However, its relationships were consistently in the opposite direction suggested by construal level theory. It is possible that this reflects a fundamental misunderstanding in how people are viewed at high and low construal levels.

For example, Trope and Liberman (2010) suggested that a high construal level involves focusing on commonalities, which implies that viewing people at a high construal level would focus one on what they have in common (with each other and perhaps with one's own self as well). However, social-psychological distance is typically talked about in terms of high construal as feeling *different* from others (Bar-Anan et al., 2006). This suggests at least one initial direction for refining the theory of social-psychological distance: to explain how these two interpretations might coexist. It's possible that when considering an individual or group, noticing differences makes them feel distant and abstract, and noticing specific commonalities makes them feel close.

But when considering ‘people’ as a whole, lumping them together makes them feel close, and splitting them apart makes them feel distant.

For the sake of researchers who attempt measuring the dimensions of psychological distance in the future, it should also be noted that a difficult aspect of developing a general measure of psychological distance was the lack of theoretical guidance on how psychological distance should function without a known target (i.e., “psychological distance *from what*?”). Another contribution of this study is that it makes an attempt to address this gap for each dimension. In the case of the social distance dimension, I answered this question with “distance from most people.”

Measuring Temporal Distance

Across both studies, the temporal distance subscale was the most congruent with theory. As in, it demonstrated the highest ratio of theory-consistent relationships relative to null relationships and theory-inconsistent relationships. Its major failing was failing to correlate with two of the three existing measures of construal level. However, it successfully correlated with one of the three existing measures of construal level (Venus et al.’s [2019] Work Construal Scale), which was the only one of the three existing construal scales to employ a Likert format (i.e., a format more similar to the PSYDIS) rather than a forced-choice design. The format similarity may only be a coincidence, but future research could consider testing a forced-choice version of the temporal distance subscale.

Measuring (Perceived) Spatial Distance

The Spatial Distance scale was in some ways the worst performing of the four PSYDIS subscales. Across all studies, it had the lowest alphas and item-total correlations, and a low number of significant relationships with outcomes relative to the other scales. Additionally, the

significant relationships it did show were inconsistent in direction, with about as many being consistent with theory as opposite-of-theory. It should be noted again here that the physical distance scale was by far the most difficult to write items for, due to difficulty answering the question "Physical distance to what?" (this 'target problem' is discussed in more detail below). However, it did show similar predictive patterns to hypothetical and temporal distance in predicting attitudes towards risk.

Spatial distance is unique from the social and hypothetical distance scales (and to a certain extent even from temporal distance), in that spatial distance, although still subjective and perceived, can have an objective component. For example, most people may reliably rate their current neighbor as physically closer than a house in another country, although the far away house may feel closer in tangibility (hypotheticality distance) if they previously lived in it. The objectivity of spatial distance made writing generalized items difficult. It might be helpful, for future attempts to measure spatial-psychological distance, to try narrowly-focused, concrete item targets (e.g., "I feel physically distant from my workplace", "I feel physically distant from the grocery store.").

Measuring Hypothetical Distance

The hypotheticality distance subscale was highly potent, in that it predicted many outcomes significantly across both studies (relative to temporal and physical distance). It was similar in overall high potency to the social distance subscale. However, unlike the social distance scale its relationships were inconsistent, with as many being in line with theory as opposite with theory. Given that it had acceptable internal structure and factor loading, it is possible that the scale measures some other construct that is different from but relevant to psychological distance and construal level. Alternatively, its inconsistency may represent a

misunderstanding of how people self-report the likelihood of events. The hypotheticality distance subscale was written based on Trope and Liberman's (2010) notion of hypothetical distance being the extent to which something feels likely or unlikely, tangible or intangible. However, it could be the case that people with typically high hypotheticality distance perceive unlikely or intangible events as more likely or tangible than others, which would make it difficult for them to self-report the unlikeliness of their thoughts.

Future research on measuring Hypotheticality distance could experiment with testing participants' comfort with specific targets that differ in objective hypotheticality (e.g., "It is more comfortable to think about a: horse/unicorn"). In addition, a more unconventional approach to measuring Hypotheticality distance could involve creating a scale like Shipp and Aeon's (2019) Temporal Focus scale that, instead of assessing inner focus on the future, past, and present, assesses focus on hypothetical fantasies. A high typical fantasy focus could imply a typical distance from real, likely events, objects, goals, and people. As another, final suggestion for future research: Given the link between positive affect and creativity (e.g., Rego et al., 2012), it would be interesting to test reactions to target stimuli for the hypotheticality dimension of both positive and negative emotional valance, versus attempting to use only neutrally valanced hypotheticality targets as in the present study.

Construal Flux

It is demonstrably true that some people in Study 3 fluctuated more in construal level than others, although the distribution of construal flux was positively skewed (towards stability over wide flux). To my knowledge this is the first study to capture construal fluctuation in a repeated-measures design and test its ability to predict outcomes. Although individual differences in construal flux failed to show a relationship with any of the included study outcome

variables, it is possible that we just haven't found the right outcome measure yet, or the right design for testing construal flux. Future tests of construal flux might involve a more objective rating of task performance (e.g., other-rated innovation), and/or an assessment of construal level over different time scales and frequencies than the daily approach employed here.

Limitations and Future Directions

This study is one of few to capture construal level in a repeated measures design. Although five daily time points perhaps paints a clearer picture of construal level's within-person stability and fluctuation than previous studies heretofore, there are a number of ways in which future studies could further expand our understanding of the phenomenology of individual construal level over time.

First, the full standard BIF scale was used on each of the daily surveys in this study. This is the same approached employed by Vallacher and Wegner (1989) in their assessment of action identification across a two-week gap in time. However, it is unknown whether some of the within-person stability exhibited by the BIF in this and previous studies is due to participants marking the same responses to the same items day to day out of habit, memory, and/or acquiescence. This study attempted to compensate for such behavior by randomizing the item order, but future studies could do more to control for these types of testing effects. As one approach, the BIF could be divided into subsets of items, as is sometimes done with other measures, but more than a few time points may subdivide the BIF too thinly. To address this, additional items could be developed for the BIF and validated using split-half reliability tests, to create many subsets of items for use in repeated measures designs.

In this study, surveys were sent out to participants at roughly the same time each day. However, participants were located in different time zones and did not all complete the survey

immediately upon receipt of the email letting them know it was available. This may limit the inferences that can be made about time-of-day effects (or lack thereof). Future studies could consider a stricter ESM design, using a phone app that signals participants to immediately complete a survey at signal time, with survey timings matched to the participants' time zones; this may help assess any within-person relationships between construal level and time-of-day. More precise timing of surveys via an ESM design would also allow for many observations within a single day, whereas this study was limited to email notifications that guaranteed only that the survey would be completed at some point on that day.

An Absence of Theory

Construal level theory itself is an incorporation of two distinct constructs: it explains how psychological distance (how close or far one feels to something) affects concrete and abstract processing (i.e., one's focus on superordinate or subordinate features). Of these three components — psychological distance, abstraction, and the bridge between them, it seems as though psychological distance has the least conceptual development under it. Research on abstraction alone has existed for many decades, and most of the construal level literature is focused on construal level theory as a 'bridge' between psychological distance and abstract processing. However, theory focused on the specific dimensions of psychological distance — in isolation from their effect on abstract/concrete processing — is limited. Even in Trope and Liberman's (2003) temporal construal theory (a precursor to construal theory focused entirely on the temporal distance dimension), the abstract and concrete processing tendencies of temporal distance were more developed than the psychological sense of temporal distance itself. Without deep theoretical development on psychological distance alone, it was difficult to write items for the Psychological Distance Scale that were deeply theory informed. Instead, when writing items

for the PSYDIS, I could draw only from the few definitions that exist, and from empirical manipulations of the dimensions of psychological distance.

Especially, I was not able to find theoretical guidance on 'target-free' psychological distance. Psychological distance is typically discussed as being in relation to a particular object, event, or person. Although previous studies (e.g., Vallacher and Wegner [1989]), as well as the present study, suggest that people have 'stable' differences in psychological distance (either directly or through construal level), the theoretical literature does not currently answer the question "What does it mean to feel generally distant in time, space, hypotheticality, or socially?" As such, it was difficult to write general, target-free items for the PSYDIS. It may be telling that, in this study, the subscale with the clearest target (social distance and "people") seemed to demonstrate the strongest relationship with outcomes. If specific targets ultimately prove to be a factor in the effective measurement of psychological distance, it might suggest that typically high or low construal level is not a persistent state of mind (like mood, for example), but a reaction tendency to a contextualized stimulus.

This type of individual difference in reactions is common in the literature on emotion appraisals. There, the same workplace situation may generate a certain emotional response (e.g., anger) in one person but not another, and this difference in appraisal is considered by emotion researchers as distinct from one's baseline moods and states (Kuppens & Tong, 2010; Kuppens et al., 2008). Individual differences in psychological distance may function more like individual differences in emotion appraisals (with specific target stimuli appraised as either high or low distance in different people), and less like individual differences in, say, mood or typical affect.

Further research to develop the theoretical side for the four dimensions of psychological distance would have also been highly useful in the development of the items. Fiedler et al. (2012)

is a good example of this, as they began pitting different dimensions of psychological distance against each other to understand the construct. This lone study laid considerable groundwork for the analyses used in Study 1's measure development efforts.

It should be noted also that the dimensions of psychological distance, measured with the PSYDIS, exhibited correlations with each other of between insignificant (for the Spatial and Social) to high-moderate (r = .48 for Temporal and Hypothetical). Most intercorrelations between dimensions were significant but only small-to-moderate in size, ranging from r = .21-.33 (see Table 6). This, combined with the finding that a superordinate factor model did not fit the data as well as a four-factor model alone, bolsters the case for more studies like this and Fiedler et al. (2012), where the relationships between dimensions can be further explored.

A greater qualitative understanding of what psychological distance feels like to those experiencing it could also greatly improve item development for future measures hoping to capture psychological distance. To this end, qualitative research on extreme populations that would likely experience high or low psychological distance of a particular dimension would have been helpful. For example, people living in remote locations (e.g., Antarctica) could be interviewed to understand spatial-psychological distance.

Given that creating a generalizable, target-free measure of psychological distance may still prove difficult for future researchers, especially in absence of further theory to guide such efforts, there is another option that might be worth exploring: create a psychological distance measure that is narrower in scope. Developing a version of the PSYDIS focused on a defined, bound universe of targets could aid measure development (at the expense of generalizability). For example, focusing the entire measure on capturing work-related psychological distance could

enable the inclusion of highly specific targets in items (e.g., “I feel physically distant from my workplace”).

Practical Implications

The results of this study suggest that stable individual differences in construal level exist. That is, some workers may be typically more 'zoomed out' on the big picture, while some workers may be typically more zoomed-in on fine-grained details. Construal level theory suggests that these differing zoom levels likely have consequences for a number of valued outcomes including creativity, communication, motivation, role-specific performance, affect, and perhaps even job fit. Although this study was not able to identify relationships between average ‘zoom level’ and creativity or detail-orientation (two common outcomes of construal level), it did find that a higher average construal level relates to more self-reported visioning behaviors, and a lower average construal level relates to more avoidance motivation. However, this study only tested a small portion of the many work-related outcomes that have been associated with construal level in previous studies — and many outcomes remain to be tested.

In the workplace and in our relationships, watch for cues of individuals being typically abstract or typically concrete in their processing (or, typically preferring the forest or the trees). Additionally, given the observation in this study that some participants varied more in their construal levels than others, we should keep in mind that, in keeping with theory, a person’s construal level can range widely, even if they are more abstract or more concrete on average.

APPENDICES

APPENDIX A: Behavior Identification Form (Vallacher & Wegner, 1989)

We would like to know how you think about certain behaviors. Any behavior can be identified in many ways. For example, one person might describe a behavior as “typing a paper”, while another might describe the behavior as “pushing keys”. Yet another person might describe the behavior as “expressing thoughts". We are interested in your FIRST IMPRESSION as to what different behaviors mean to you. Below you will find a list of behaviors and two different ways in which the behavior might be identified. Please select the one that best describes the behavior for you. There are no right or wrong answers.

1. Making a list Getting organized ~ Writing things down	14. Climbing a tree Getting a good view ~ Holding on to branches
2. Reading Following lines of print Gaining knowledge	15. Filling out a personality test Answering questions ~ Revealing what you're like
3. Joining the Army Helping the Nation's defense ~ Signing up	16. Toothbrushing Preventing tooth decay ~ Moving a brush around in one's mouth
4. Washing clothes Removing odors from clothes ~ Putting clothes into the machine	17. Taking a test Answering questions Showing one's knowledge ~
5. Picking an apple Getting something to eat Pulling an apple off a branch	18. Greeting someone Saying hello Showing friendliness ~
6. Chopping down a tree Wielding an axe Getting firewood ~	19. Resisting temptation Saying "no" Showing moral courage ~
7. Measuring a room for carpeting Getting ready to remodel Using a yardstick	20. Eating Getting nutrition ~ Chewing and swallowing
8. Cleaning the house Showing one's cleanliness ~ Vacuuming the floor	21. Growing a garden Planting seeds Getting fresh vegetables ~
9. Painting a room Applying brush strokes Making the room look fresh ~	22. Traveling by car Following a map Seeing countryside ~

10. Paying the rent Maintaining a place to live ~ Writing a check 11. Caring for houseplants Watering plants Making the room look nice ~ 12. Locking a door Putting a key in the lock Securing the house ~ 13. Voting Influencing the election ~ Marking a ballot	23. Having a cavity filled Protecting your teeth ~ Going to the dentist 24. Talking to a child Teaching a child something ~ Using simple words 25. Pushing a doorbell Moving a finger Seeing if someone's home ~

APPENDIX B: Work Construal Scale (Venus et al., 2019)

How much do you agree with the following statements?
Ratings will be provided on a 5-point scale (1 = strongly disagree, 5 = strongly agree).

1. At this moment I am focused on the big picture rather than on details
2. At this moment I am focused on the general meaning or overall effect of my work
3. At this moment I care more about central characteristics of my actions rather than specifics."

APPENDIX C: Work-Based Construal Scale (Reyt & Wiesenfeld, 2014)

We would like to know how you think about certain behaviors. Any behavior can be identified in many ways. For example, one person might describe a behavior as “typing a paper”, while another might describe the behavior as “pushing keys”. Yet another person might describe the behavior as “expressing thoughts". We are interested in your FIRST IMPRESSION as to what different behaviors mean to you. Below you will find a list of behaviors and two different ways in which the behavior might be identified. Please select the one that best describes the behavior for you. There are no right or wrong answers.

1. Preparing a report Compiling information Showing progress	10. Developing a procedure Writing down step-by-step instructions Increasing work efficiency
2. Using a computer Typing on a keyboard Processing information	11. Writing business correspondence Composing an email Maintaining a good business relationship
3. Filling out a business form Filling in blanks with information Following work protocol	12. Hiring someone Interviewing candidates Maintaining staff level
4. Obtaining information from someone Asking relevant questions Gaining knowledge	13. Developing a budget Listing expenses and revenues Managing funds
5. Making a presentation Presenting relevant material Communicating knowledge	14. Proofreading a document Reading carefully for errors Ensuring accuracy
6. Assigning work to someone Telling someone what to do Getting things done	15. Training someone Showing someone how to do things Increasing someone’s productivity
7. Communicating information to someone Sending an email or talking to someone Keeping someone informed	16. Analyzing an operational report Reviewing information Ensuring smooth operation
8. Analyzing a dataset Comparing numbers Identifying trends	17. Orienting a new worker Showing a new worker around Acclimating a new worker
9. Attending a meeting Being present and paying attention Staying up to date	18. Evaluating someone’s performance Reviewing quality of work Providing feedback

APPENDIX D: Biographical Inventory of Creative Behaviors (Batey, 2007)

Please answer as truthfully as you can. Check the box next to the activities you have been actively involved in. In the past 12 months have you...

1. Written a short story
2. Written a novel
3. Organised an event, show, performance or activity
4. Produced a TV/Play script
5. Designed and produced a textile product (e.g. made an item of clothing or household object)
6. Redesigned and redecorated a bedroom, kitchen, personal space, etc.,
7. Invented and made a product that can be used
8. Drawn a cartoon
9. Started a club, association or group
10. Produced a picture, i.e. NOT a doodle (using paint, pencils, charcoal, acrylic, etc.,)
11. Had an article published
12. Formed a sculpture using any suitable materials
13. Recognised where an accepted scientific theory/approach does not explain what it purports to
14. Produced your own food recipes
15. Produced a short film
16. Produced your own website
17. Produced a theory to explain a phenomenon
18. Invented a Game or other form of entertainment
19. Selected to lead/manage others
20. Gave someone a present
21. Composed a poem
22. Adapted an item and used it in a way that it was not designed to be, in what you consider to be an ingenious way
23. Published research
24. Choreographed a dance
25. Designed and planted a garden
26. Produced a portfolio of photographs (NOT photographs of a holiday, party, etc.,)
27. Acted in a dramatic production
28. Delivered a speech
29. Mentored/Coached someone else to improve their performance
30. Devised an experiment to help understand something
31. Made up a joke
32. Been made a leader/captain of a teanVgroup (e.g. Debating society chairperson, Captain of the Hockey team, etc.,)
33. Composed a piece of music
34. Made a collage

APPENDIX E: Detail Orientation (Cloninger et al., 1994)

How much do each of the following statements describe you?
Ratings will be provided on a 5-point scale (1 = Not at all like me, 5 = A lot like me).

Am not likely to notice small visual details.
Am way too detail-oriented.
Have an eye for detail.
Pay too little attention to details.

APPENDIX F: Risk Taking (Tellegen & Waller, 2008)

How much do each of the following statements describe you?
Ratings will be provided on a 5-point scale (1 = Not at all like me, 5 = A lot like me).

+ keyed	Would never go hang gliding or bungee jumping.
	Would never make a high-risk investment.
	Avoid dangerous situations.
– keyed	Seek danger.
	Am willing to try anything once.
	Do dangerous things.
	Enjoy being reckless.
	Seek adventure.
	Take risks.
	Do crazy things.

APPENDIX G: Approach Motivation (Carver & White, 1994)

How much do each of the following statements describe you?
Ratings will be provided on a 5-point scale (1 = Not at all like me, 5 = A lot like me).

When I get something I want, I feel excited and energized.
When I'm doing well at something, I love to keep at it.
When good things happen to me. it affects me strongly.
It would excite me to win a contest.
When I see an opportunity for something I like, I get excited right away.

When I want something. I usually go all-out to get it.
I go out of my way to get things I want.
If I see a chance to get something I want, I move on it right away.
When I go after something I use a "no holds barred" approach.
I will often do things for no other reason than that they might be fun.
I crave excitement and new sensations.
I'm always willing to try something new if I think it will be fun.
I often act on the spur of the moment.

APPENDIX H: Industriousness

How much do each of the following statements describe you?
Ratings will be provided on a 5-point scale (1 = Not at all like me, 5 = A lot like me).

+ keyed	Work hard.
	Do more than what's expected of me.
	Am always busy.
	Am exacting in my work.
	Set high standards for myself and others.
	Am ready to do battle for a cause.
	Accomplish a lot of work.
	Am always on the go.
– keyed	Do just enough work to get by.
	Put little time and effort into my work.

APPENDIX I: Openness (Soto & John, 2017)

Please indicate the extent to which you identify with the following statements.
Ratings will be provided on a 5-point scale (1 = Not at all like me, 5 = A lot like me).

1. Is original, comes up with new ideas.
2. Has little creativity.

APPENDIX J: Spontaneous Trait Inference (Yang & Wang, 2016)

The following 5 items will be timed, so please pay attention.

Screen 1: Please read the following statement. [One of the 5 statements below will be randomly presented.]

Screen 2: Did the previous sentence contain the following word? Please click yes or no. [The associated target trait will be displayed.]

Polite	Zhang Lei knocked at the door first before entering the room.
Helpful	Chao helped an elderly lady take her luggage to the station.
Honest	Zhao Qian voluntarily admitted the truth, which is that he broke the vase.
Clean	Liu Mei washed his hands thoroughly after going to the restroom.
Clever	Yuan Jie encountered a puzzle during an examination.

APPENDIX K: Temporal Focus (Shipp & Aeon, 2019)

Please read the following statements and indicate how much each reflects your daily thoughts.

Ratings will be provided on a 5-point scale (1 = Strongly disagree, 5 = Strongly agree).

1. I think about things from my past.
2. I live my life in the present.
3. I think about what my future has in store.
4. I focus on what is currently happening in my life.
5. I focus on my future.
6. I replay memories of the past in my mind.
7. I imagine what tomorrow will bring for me
8. My mind is on the here and now.
9. I reflect on what has happened in my life.
10. I think about where I am today
11. I think back to my earlier days.
12. I think about times to come.

APPENDIX L: Creativity (Silvia et al., 2008)

Our study today is about how people think creatively, like how people come up with original, innovative ideas. Everyone can think creatively, and we'd like to learn more about how people do it. So today people will work on a few different creativity tasks, which look at how people think creatively.

For this task, you should fill-in all of the original and creative uses for a brick that you can think of. Certainly there are common, unoriginal ways to use a brick; for this task, write down all of the unusual, creative, and uncommon uses you can think of. You'll have three minutes.

APPENDIX M: Detail-Oriented Task Performance (Seliant, 2012)

You will be shown two or more short strings of text and be required to quickly determine if they are 100% identical or not. The strings of text can be names of persons or companies, short addresses, numbers or any other short text string. You will be working under a very strict time limit and are required to work quickly but precisely. Try to compare the text strings below, are they 100% identical?

7164 North Rockledge Ave. Villa Park, IL 60181	7164 North Rockledge Ave. Villa Park, IL 60181	7164 North Rockledge Ave. Villa Park, IL 60181	7164 North Rockledge Ave. Villa Park, IL 60181
9 N. Gregory St. Waxhaw, NC 28173	9 N. Gregory St. Waxhaw, NC 28173	9 N. Gregory St. Waxhaw, NC 28113	9 N. Gregory St. Waxhaw, NC 28173
9881 Philmont Street Park Forest, IL 60466	9881 Philmont Street Park Forest, IL 60466	9881 Philmont Street Park Forest, IL 60466	9881 Philmont Street Park Forest, IL 60466
875 Park Street Hopewell, VA 23860	875 Park Street Hopewell, VA 23860	875 Park Street Hopewell, VA 23860	875 Park Street Hopewell, VA 23860
4488 Ann Dr. Chesterton, IN 46304	4488 Ann Dr Chesterton, IN 46304	4488 Ann Dr. Chesterton, IN 46304	4488 Ann Dr. Chesterton, IN 46304

APPENDIX N: Overall Job Performance

Compared to your typical level, how would you rate your overall job performance this week?

Ratings will be provided on a 5-point scale (1 = Much lower job performance than usual, 2 = A little lower job performance than usual, 3 = About the same job performance as usual, 4 = A little higher job performance than usual, 5 = Much higher job performance than usual).

APPENDIX O: Avoidance Motivation Measure (Carver & White, 1994)

1. If I think something unpleasant is going to happen I usually get pretty “worked up.”
2. I worry about making mistakes.
3. Criticism or scolding hurts me quite a bit.
4. I feel pretty worried or upset when I think or know somebody is angry at me.
5. Even if something bad is about to happen to me, I rarely experience fear or nervousness.
6. I feel worried when I think I have done poorly at something.
7. I have very few fears compared to my friends.

APPENDIX P: Present Temporal Focus (Ship & Aeon, 2019)

Please read the following statements and indicate how much each reflects your daily thoughts.

Ratings will be provided on a 5-point scale (1 = Strongly disagree, 5 = Strongly agree).

1. I focus on what is currently happening in my life.
2. My mind is on the here and now.
3. I think about where I am today.
4. I live my life in the present.

APPENDIX Q: Risk Avoidance (Tellegen & Waller, 2008)

Please read the following statements and indicate how much you agree with them.

1. Would never go hang gliding or bungee jumping.
2. Would never make a high-risk investment.
3. Avoid dangerous situations.
4. Seek danger.
5. Am willing to try anything once.
6. Do dangerous things.
7. Enjoy being reckless.
8. Seek adventure.
9. Take risks.
10. Do crazy things.

APPENDIX R: Preference for Remote Work (Peters et al., 2004)

1. When it comes to working remotely (e.g., from home), what is your preference?

1 - I prefer working all of my hours at my organization's physical offices.			3 - I don't have a preference either way.			7 - I prefer working all of my hours remotely (e.g., from home).

APPENDIX S: Visioning Measure (Guillén & Florent-Treacy, 2011)

I look beyond my existing limitations.

Never	Rarely	Sometimes	Often	Always

APPENDIX T: OCB-I Measure (Spector et al., 2010)

How often have you done each of the following things on your present job?	Never	Once or twice	Once or twice/month	Once or twice/week	Every day
1. Took time to advise, coach, or mentor a co-worker.	1	2	3	4	5
2. Helped co-worker learn new skills or shared job knowledge.	1	2	3	4	5
3. Helped new employees get oriented to the job.	1	2	3	4	5
4. Lent a compassionate ear when someone had a work problem.	1	2	3	4	5
5. Helped a co-worker who had too much to do.	1	2	3	4	5

APPENDIX U: Task Urgency (Landy et al., 1991)

Please indicate how much each of the following statements reflects your typical behavior.

1 – Very untrue of me	2 – Untrue of me	3 – Somewhat untrue of me	4 – Neutral	5 – Somewhat true of me	6 – True of me	7 – Very true of me

1. I am slow doing things
2. My work is slow and deliberate
3. I work slowly.
4. I do things in a hurry.
5. I work fast.
6. I work quickly and energetically.

APPENDIX V: Innovation (Welbourne, Johnson, and Erez, 1998)

Please rate your own performance this week on the following dimensions:

1 – Needs much improvement	2 – Untrue of me	3 – Somewhat untrue of me	4 – Neutral	5 – Somewhat true of me	6 – True of me	7 – Very true of me

1. Coming up with new ideas
2. Working to implement new ideas
3. Findings improved ways to do things
4. [Attention check] Select “Needs much improvement”
5. Creating better processes and routines.

APPENDIX W: Psychological Distance Scale Items

First Draft

These items were used in the SME card sorting study.

Social Distance

1. I feel like Most people are similar to me→Most people are different from me
2. I like to keep people Close→At a distance
3. If I were to meet a new person, I would assume that… I do not have much in common with them→I have a lot in common with them
4. When I interact with somebody, I focus on figuring out… What they are trying to do right now→What they are trying to do broadly in life
5. I think that people are Unique and different→Essentially the same
6. When I interact with people I focus on how they are feeling right now→I focus on what they are like in general
7. When I interact with people I focus on their feelings in the moment→I focus on their overall characteristics
8. I feel Close to most people→Distant from most people
9. When I think of a stranger in a far away country, I feel Close to them→Distant from them
10. When I think of a stranger in a far away country, I feel Similar to them→Different from them
11. When I think of a close friend, I feel Similar to them→Different from them
12. It is more enjoyable to think about People similar to me→People different from me
13. It is more comfortable to think about People similar to me→People different from me
14. It is more comfortable to think about People as close to me→People as separate from me

Temporal Distance

1. One year is… A long amount of time→A short amount of time
2. Think about your short-term future. How far ahead did you think? 1 Day→1 Month or more
3. Think about your long-term future. How far ahead did you think? 1 Year→More than 25 years
4. Think about your recent past. How far back did you think? 1 Day→1 Year or more
5. When I think of the distant past I picture events [R] Before my lifetime→Within my lifetime
6. When I think of the distant future I picture events That may occur within my lifetime→That will likely occur after I am gone
7. It is more enjoyable to think about Near-term goals→Very distant future goals
8. It is more comfortable to think about Near-term goals→Very distant future goals
9. I feel… Focused on the present moment→Detached from the present moment
10. I feel focused on What is happening right now→Things that are happening at another time
11. I feel very… In the moment→Detached from the present moment

12. I perceive… Time moving by slowly→Time moving by quickly
13. My sense of what happened before this moment is… Clear→Vague
14. I feel very… Close to the present moment→Far from the present moment

Physical distance

1. I feel like I am positioned in a Central location→Remote location
2. I feel Physically close to places that matter to me→Physically far away from places that matter to me
3. I feel more comfortable with Cozy spaces→Big, vast spaces
4. One mile is A large amount of distance→A small amount of distance
5. I feel A sense of closeness in space→A sense of distance in space
6. I feel like my body is positioned Up close→At a distance
7. The physical world around me feels very Familiar→Unfamiliar
8. The physical objects around me feel very Familiar→Unfamiliar
9. The physical objects around me feel Close together→Far apart
10. My physical surroundings feel Cramped→Spacious
11. Most places in the world feel Close to me→Far away from me
12. It is more enjoyable to think about Places close by→Places far away
13. It is more comfortable to think about Places that are close by→Places that are far away

Hypothetical Distance

1. I like thinking about Practical, possible things→Fantastical things that do not exist
2. I like thinking about Things that could realistically happen→Things that may never happen
3. I think Possibilities are restricted by practical constraints→Anything is possible
4. I feel more Pragmatic→Visionary
5. I feel more Realistic →Idealistic
6. It is more enjoyable to think about Things I have seen before→Things I have not seen before
7. If I were to write a book right now, it would be… Nonfiction→Fiction
8. I feel more motivated by Tangible rewards→Abstract rewards
9. I feel Grounded in reality→Detached from reality
10. Most of my thoughts are … About things that are likely→About things that are unlikely
11. It is more comfortable to think about things that are Likely to happen→Unlikely to happen
12. Thinking about impossible things feels Pointless→Productive
13. It is more comfortable to think about Realistic things→Fantastic things

Second Draft

These items were used in Study 1. Includes one attention check item.

Social Distance

1. I feel like Similar to most people→Different from most people
2. I like to keep people Close→At a distance
3. If I were to meet a new person, I would assume that… I do not have much in common with them→I have a lot in common with them

4. If I were to interact with a new person right now, I would focus on... Figuring out their immediate mood →Figuring out their general personality
5. I think that people are Unique and different→Essentially the same
6. If I were to interact with my close friend right now, I would focus on... Their immediate mood→Their overall personality
7. When I interact with people I focus on their immediate feelings → I focus on their overall characteristics
8. I feel Close to most people → Distant from most people
9. If I were to meet a stranger, I would feel Close to them→ Distant from them
10. If I were to meet a stranger, I would feel Similar to them→ Different from them
11. When I think of a close friend, I feel Similar to them→ Different from them
12. It is more comfortable to think about People similar to me→ People different from me
13. I feel like Keeping people close→Keeping people at a distance
14. [Attention check] The color of the grass is (please answer "green")

Temporal Distance

1. One year is… A long amount of time→ A short amount of time
2. Think about your short-term future. How far ahead did you think? 1 Day→6 Months or more
3. Think about your long-term future. How far ahead did you think? 1 Year→ More than 25 years
4. Think about your recent past. How far back did you think? 1 Day→1 Year or more
5. When I think of the distant past I picture events [R] Before my lifetime→Within my lifetime
6. When I think of the distant future I picture events 1 Year from now→25 Years or more from now
7. It is more comfortable to think about Near-term goals→Very distant future goals
8. I feel… Focused on the here and now→Far from the present
9. I feel focused on What is happening right now→Things that are happening at another time
10. I perceive… Time moving by slowly→Time moving by quickly
11. My sense of what happened before this moment is… Clear→Vague
12. It is more comfortable to think about Events in the present → Events in the future
13. It is more comfortable to think about Events in the present → Events in the past
14. It is more rewarding to think about Events in the present → Events in the future

Physical distance

1. I feel like I am positioned in a Central location→ Remote location
2. I feel Physically close to places that matter to me→ Physically far away from places that matter to me
3. I feel more comfortable with Cozy spaces→ Big, vast spaces
4. One mile is A large amount of distance→ A small amount of distance
5. My physical surroundings feel Cramped→Spacious
6. My face is positioned Close to the screen→Far from the screen
7. The world feels Big → Small
8. Most places in the world feel Close to me→Far away from me
9. It is more comfortable to think about Places that are close by→Places that are far away

Hypothetical Distance

1. I like thinking about Practical, possible things→ Fantastical things that do not exist
2. I like thinking about Things that could realistically happen→ Things that may never happen
3. I think Possibilities are restricted by practical constraints→Anything is possible
4. I feel more Pragmatic→Visionary
5. If I were to write a book right now, it would be… Nonfiction→ Fiction
6. I feel more motivated by Tangible rewards→ Abstract rewards
7. I feel Grounded in reality→ Detached from reality
8. Most of my thoughts are … About things that are likely→ About things that are unlikely
9. It is more comfortable to think about things that are Real→ Hypothetical
10. Thinking about impossible things feels Pointless→ Productive
11. It is more comfortable to think about Realistic things→ Fantastic things

Final Draft

These items were used in Study 2 & 3

Social Distance

I feel like keeping people close / keeping people at a distance.
I feel close to most people / distant from most people.
I feel similar to most people / different from most people.
If I were to meet a stranger, I would feel similar to them / different from them.

Temporal Distance

It is more comfortable to think about near-term goals / very distant future goals.
I feel focused on the here and now / far from the present.
I feel focused on what is happening right now / things that are happening at another time.
It is more comfortable to think about events in the present / events in the future.

Hypotheticality Distance

I feel more pragmatic / visionary.
I feel grounded in reality / detached from reality.
Most of my thoughts are about things that are likely / about things that are unlikely.
It is more comfortable to think about events that are real / hypothetical.
It is more comfortable to think about realistic things / fantastic things.

Spatial Distance

I feel more comfortable with cozy spaces / big, vast spaces.
The world feels big / small.
It is more comfortable to think about places that are close by / places that are far away.
I feel like I want to be in a cozy space / big, vast space.
[attention check]: Choose the option that says second First / Second

APPENDIX X: Item-Level Convergent Validity with Existing Measures. Correlations Between PSYDIS Items and Existing Measures.

	BIF	WCS	WBCS
Social Distance	**-0.23*** **	**-0.17** **	**-0.18** **
I feel like keeping people close / keeping people at a distance.	-0.19**	-0.11	-0.12
I feel close to most people / distant from most people.	-0.28***	-0.17**	-0.18**
I feel similar to most people / different from most people.	-0.12	-0.11	-0.14*
If I were to meet a stranger, I would feel similar to them / different from them.	-0.13*	-0.13*	-0.11
Temporal Distance	**0.11**	**0.12***	**0.07**
It is more comfortable to think about near-term goals / very distant future goals.	0.07	0.19**	0.07
I feel focused on the here and now / far from the present.	0.05	0.05	0.03
I feel focused on what is happening right now / things that are happening at another time.	0.13*	0.06	0.06
It is more comfortable to think about events in the present / events in the future.	0.08	0.09	0.06
Hypotheticality Distance	**-0.05**	**0.06**	**-0.07**
I feel more pragmatic / visionary.	0.11	0.16*	-0.03
I feel grounded in reality / detached from reality.	-0.08	0.04	-0.13*
Most of my thoughts are about things that are likely / about things that are unlikely.	-0.11	0.03	-0.1
It is more comfortable to think about events that are real / hypothetical.	-0.07	0.02	0.01

It is more comfortable to think about realistic things / fantastic things.	-0.04	-0.03	-0.04
Spatial Distance	**0.03**	**0.17****	**0.04**
I feel more comfortable with cozy spaces / big, vast spaces.	0.1	0.2**	0.03
The world feels big / small.	-0.1	0.01	-0.03
It is more comfortable to think about places that are close by / places that are far away.	0.02	0.08	0.06
I feel like I want to be in a cozy space / big, fast space.	0.05	0.16**	0.03

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