CENTRAL VALUES AS CONSTRAINTS:

SITUATIONAL ACCESSIBILITY OF CENTRAL VALUES PREDICTS EXPLORATION

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ABSTRACT

It is a common phenomenon that values become part of people's self-concept. In fact, self-defining or *central values* are various and prevalent, and offer a myriad of psychological benefits. Central values also profoundly affect people's motivation and behavior. Central values, when assessible in a situation, are associated with greater openness for exploration. Two existing theories have offered explanations for the psychological underpinnings of the link between central value accessibility and exploration. Self-Affirmation Theory postulates that accessibility of central values offers a constructive avenue to achieve a positive self-image. As a result, people are better equipped to face uncertainty and engage in exploration. Another line of research on Adult Attachment Theory claims that the behavior systems of attachment and exploration are interconnected in adults. Because central values are rooted in social connections with others, situational accessibility of central values enhances people's secure attachment to care-giving figures. This enhanced relational resources support people's exploratory endeavors.

In this dissertation, I propose a novel and a more general, though not incompatible theoretical account to explicate the link between central value accessibility and exploration. I draw on the notion of *constraints* from research on belief systems and conceptualize central values as a constrained system as well. I argue that the constraints of central values are maintained through three mechanisms: 1) central values are embedded in a web of other concepts; 2) central values are reinforced by behavioral mechanisms; 3) central values are shared by one's meaningful social relationships. I also delineate the psychological benefits and downsides that come with the constraints of central values. I then suggest that people react to constraints of central values by engaging in exploration to increase their experience of freedom. Here, I construe exploration as a domain-general motivational state in which people experience

a desire to approach uncertain situations and objects. Exploration imparts uncertainty to the self, thereby restoring the dynamism of the self-concept. Overall, this constraint-based account of central values sheds light on how people can benefit from having central values while lessening the self-rigidity that comes with it.

I also summarize existing theories on psychological balance, positing that people gravitate towards a certain psychological state that they feel most comfortable with. When they deviate from that state, they experience a tendency to return to it. I review a wide array of relevant theories on psychological balance and suggest that balance might be the nexus of otherwise disparate findings in the literature. In this context, the link between central value accessibility and exploration could be understood as people's tendency to balance the stability and dynamism of the self-concept.

Across a series of five empirical studies, I find evidence in support of my main hypotheses, using a wide range of samples and contexts. In addition, I show that an interest in exploration subsequently predicts risk-taking behaviors such as choosing risky options in a lottery. I also identify an important antecedent of central values: the level of sharedness of values by one's in-group members.

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Introduction

Understanding who we are has been a fundamental quest for humanity (Greenwald &
Pratkanis, 1984; James, 1890; Kihlstrom & Cantor, 1984; Markus & Wurf, 1987; Mischel &
Shoda, 1995; Linville, 1987; McConnell, 2011; Serpe & Stryker, 2011; Markus & Kunda,
1986; Markus, 1977). One simple answer to the question of who we are is that *we are what
we value*. Values are beliefs about what is important in life. These abstract principles
prescribe desirable goals and end states and provide guidance for decision-making across a
wide arrays of situations (Schwartz, 2012).

It is a common phenomenon that values become part of people's self-concept. In fact,
self-defining or central values are various and prevalent. For example, people who identify as
environmentalists define who they are by a particular belief that environmental action is
important. Supreme court Judges see themselves as embodying the value of justice. Social
activists at times put their life at risk in order to preserve their values. People make tattoos to
impart a sense of permanence to values that represent who they are.

Central values play a powerful role as people navigate their everyday life. Central
values are likely to be intertwined with other concepts or ideas people also hold (Feldman,
1988). When central values are accessible in a situation, people tend to behave consistently
with their values (Verplanken & Holland, 2002). Shared values with others in one's social
group help people to build and reinforce social relationships (Hardin & Higgins, 1996).

Central values also profoundly affect people's motivation and behavior. People who
are reminded of their central values show greater openness to explore unknown situations or
objects. Two theories have offered explanations for the psychological underpinnings of the
link between central value accessibility and exploration. Self-Affirmation Theory postulates

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that accessibility of central values offers a constructive avenue to achieve a positive self-image (Steele, 1988; Cohen & Sherman, 2014). As a result, people are better equipped to face uncertainty and engage in exploration. Another line of research on Adult Attachment Theory claims that the behavior systems of attachment and exploration are interconnected in adults (Green & Campbell, 2000). Because central values are rooted in social connections with others (Hardin & Higgins, 1996), situational accessibility of central values enhances people's secure attachment to care-giving figures. This enhanced relational resources support people's exploratory endeavors.

In this dissertation, I propose a novel and a more general, though not incompatible theoretical account to explicate the link between central value accessibility and exploration. I construe *constraints* as a key property of central values, and suggest that people react to such constraints by engaging in exploration to increase their experience of freedom. Through exploration, people restore the dynamism of the self-concept. This constraint-based account of central values sheds light on how people can benefit from having central values while lessening the self-rigidity that comes with it.

Below, I first review research on values and then define centrality of values based on related literature on centrality of beliefs, attitudes, and racial identity. I then suggest that while central values are deceptively "personal", they are rooted in people's social relationships with others. I also explain the accessibility of central values in various situations. After that, I draw on the notion of *constraints* from research on belief systems and conceptualize central values as a constrained system as well. I argue that the constraints of central values are maintained through three mechanisms: 1) central values are embedded in a web of other concepts; 2) central values are reinforced by behavioral mechanisms; 3) central values are shared by one's meaningful social relationships. I then delineate the psychological benefits and downsides that come with the constraints of central values.

I further examine how people manage potential downsides of holding central values. I propose that the link between central values and exploration is an important clue. In the following sections, I review a rich body of literature on exploration and then define exploration as a domain-general motivational state, in which people are interested in approaching uncertain situations or objects. After that, I proceed to summarize two prominent theories that examined the link between central values and exploration. I analyze the underlying assumptions of these two theories. Finally, I develop a constraint-based account of central values and explain why exploration could remedy the downsides of central values by helping people to be dissociated from their current conception of the self.

I conclude the theoretical introduction part by discussing people's general tendency towards maintaining a psychological state of *balance*. I suggest that people gravitate towards a certain psychological state that they feel most comfortable with. When they deviate from that state, they experience a tendency to return to it. I review a series of related theories and suggest that balance might be the nexus of otherwise disparate findings in the literature. In this context, the link between central value accessibility and exploration could be understood as people's tendency to balance the stability and dynamism of the self-concept.

Research on Values

Values are broadly defined as beliefs about desirable end states (Rokeach, 1973; Schwartz, 1992). Such beliefs are considered as deriving from basic human needs and are universal across cultures (Schwartz & Bilsky, 1987). People's values guide goal pursuit and decision-making across different domains (Schwartz et al., 2012; Schwartz & Boehnke 2004).

Values are *evaluative* beliefs and therefore could be differentiated from other *descriptive* beliefs or worldviews (e.g., Lerner, 1980). Values transcend specific situations and hence are different from attitudes, which are evaluative beliefs that focus on specific

objects and situations (Ajzen, 2001). Values are broader in scope and but weaker in cognitive contents than political ideologies (Jost, Glaser, Kruglanski, & Sulloway, 2003; Maio & Olson, 1998). Values have motivational and affective components and are different from cognitive schemes. Values prescribe goals (Eccles & Wigfield, 2002), whereas schemes help people to construct a coherent understanding of an otherwise ambiguous situation or experience (Gilbert & Malone, 1995; Crum, Salovey, & Achor, 2013; Markus, Smith, & Moreland, 1985).

Values are a perennial research topic and have been examined in relation to a variety of research questions (Maio, Olson, Bernard, & Luke, 2006). Scholars have studied both discrete values and value systems. Discrete values such as justice or freedom are considered representations of *cultural truisms* due to their wide acceptance and sharedness by a population (Ajzen, 2001; Maio & Olson, 1998). Such general values are rarely questioned and often taken for granted as desirable. People do not typically have a cognitive basis or rationale for why they hold a value. In fact, research found that analyzing one's reasons for particular values led values to change (Maio & Olson, 1998). Overall, prevailing values are supported by strong and positive feelings attached to them, as well as information about one's past value-consistent behaviors (Maio & Olson, 1998).

Discrete values could also be meaningfully organized into an ordered system based on their relative importance. One single value enables people to make an absolute claim (e.g., "Freedom is important."), whereas an ordered system of values allows people to make a relative claim (e.g., "Equality is more important than freedom."). Schwartz (1992) provided a taxonomy of universal values based on their unique motivational bases. Multiple values could be meaningfully organized based on two relevant dimensions: self-enhancement versus self-transcendence and openness to change versus conservation.

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Centrality of Values to the Self

One important dimension of values is *centrality*, defined as the degree to which values are part of people's self-concept. The term *centrality* is most frequently used in the study of social networks to describe the level of connections that a focal node (e.g., a leader) has in relation to other nodes (e.g., other members of an organization) (Borgatti, 2005). In a broad sense, centrality could be applied to describe the network position of any component in a system. For example, political scientists and sociologists tend to map out a belief system and recognize a central belief based on the level of connections it has with other beliefs (Converse, 1964; Tetlock, 1989). Central beliefs also play a crucial role for sustaining one's belief system by structuring more peripheral beliefs (Feldman, 1988).

In the field of social psychology, researchers define centrality based on the degree to which a certain property is constitutive of the self. Hence, centrality describe the *self-importance* of beliefs or social relationships (Feldman, 1988; Judd & Krosnick, 1982; Leach et al., 2008), including centrality of attitudes, values, and group membership, among others. Below I briefly review research on centrality of attitudes and centrality of group membership/identity before elaborating on centrality of values to the self.

Group Membership/Identity Centrality

People hold multiple roles and social group memberships (Ellemers, Kortekaas, & Ouwerkerk, 1999; Luhtanen & Crocker, 1992; Settles, 2004). A person can be a woman, a Hispanic, an engineer, and a daughter. Not all of the identities based on their memberships in social groups are important to how a person defines themselves. Identity centrality indicates a hierarchical ordering of multiple identities based on their proximity to a person's core definition of self (Rowley, Sellers, Chavous, & Smith, 1998). For instance, racial identity centrality is defined as a dimension of identification with one's racial groups and indicates their proclivity to define themselves with respect to race (Rowley et al., 1998; Sellers et al.,

1997). Overall, centrality is considered a dimension of group identification that describes how much people's group membership is defining of their overall sense of self (Cameron, 2004; Leach et al., 2008).

Attitude Centrality

The construct of *attitude* represents a summary evaluation of a psychological object captured in various attribute dimensions (Ajzen, 2001; Ajzen & Fishbein, 2000). Centrality is considered an important dimension alongside attitude direction (positive vs. negative), extremity (degree of favorableness or unfavorableness), certainty (subjective sense of conviction), and intensity (strength of feeling), among other dimensions (Ajzen, 2001; Gross, Holtz, & Miller, 1995; Skitka, Bauman, & Sargis, 2005). Centrality describes the extent to which an attitude is important or self-involving to an individual (Judd & Krosnick, 1982). So attitude centrality is also termed "attitude importance" or "attitude involvement" (Boninger, Krosnick, Berent, & Fabrigar, 1995). Central attitudes are considered fundamental for self-definition and have affective properties of varying degrees of intensity (Sherif & Cantril, 1947). People are likely to express strong sentiment about their central attitudes.

Centrality of Discrete Values

People can identify with a particular value and link it to their self-definition. A value as a central conception of the self tends to be well elaborated (Markus & Wurf, 1987). It becomes a lens for people to perceive their social world and derive meaning from it (Aquino et al., 2009; Markus, Smith, & Moreland, 1985). A central value is also termed a "core value" (Feldman, 1988). For example, Feldman (1988) distilled three core values ("equality of opportunity", "economic individualism", and "free enterprise") and suggested that these three core values helped to structure the public's political opinions and evaluations. Recent research suggests that values that are considered part of people's self-definition (i.e., central

values) are more likely to be associated with value-consistent behaviors than less central values (Verplanken & Holland, 2002).

Centrality of Value Systems

In addition to anchoring their self-concept to a single value, people can think about their value system as a whole and make a determination about how much their values are defining of who they are in comparison with other components that are also constitutive of their self-concept. The self-concept is considered multi-faceted and consists of beliefs, values, memories, emotions, somatic experience and so on (Campbell et al., 1996). People can think of different components of the self as more or less central to their self-definition.

For instance, central values could be contrasted with *central emotions*. In addition to values, people also possess discrete emotion profiles that allow them to *feel* and enact their identity (Coleman & Williams, 2013). Emotions can play a powerful role as people process information and make decisions (Barrett, Mesquita, Ochsner & Gross, 2007; Cacioppo & Gardner, 1999). Hence, people may embrace certain components of their self-concept (e.g., emotions) to be more defining of who they are than other components (e.g., values). As a result, they are more likely to think of and act consistent with their own feelings or emotions rather than values. This relative importance of different components could be especially meaningful for people who are low on self-complexity (Linville, 1987), since they are less likely to hold and switch between multiple facets of themselves.

Less Central Values

People on average hold a set of values in life. Nonetheless, they vary in the extent to which they consider values to be a central part of their self-concept. As an example, one can agree that taking environmental action is important but doesn't see themselves as an environmentalist. Central values tend to be more cognitive accessible and connected to other

components in people's belief systems. Less central values are less accessible to people and are likely to be peripheral to a web of concepts that people hold.

Furthermore, central values tend to have accompanying distinct affective components—feelings and emotions such as pride and joy are consistently associated with particular values, and thus facilitate quick accessibility of values for decision-making. By contrast, less central values are loosely or unreliably associated with feelings and emotions. Finally, people rely on central values to distinguish themselves from others, especially from out-group members. People's central values connect them with in-group members. Less central values do not serve the same purpose of identity distinction and social connection.

Central Values and Social Connections

While people generally consider central values to be "personal", I propose that central values are derived from people's connections with important others. People acquire values from their social environment through a socialization process by which values are repeatedly communicated and acted upon by members in their immediate community (Bales & Parsons, 2014; Hitlin & Piliavin, 2004; Hyman, 1959). Relatedly, people generally desire that their values be shared by in-group members (Echterhoff, Higgins, & Levine, 2009; Hardin & Higgins, 1996). Perceived commonality of one's values with in-group members is crucial for people to construct their self-concept based on values (Hardin & Higgins, 1996). Group membership is a primary aspect of one's self-concept (Ashforth & Mael, 1989; Hogg, 2006). Hence, if a value is consistent with one's group membership, it is more likely to be linked to one's self-concept than if two aspects of the self are in conflict with one another (Campbell et al., 1996; Festinger, 1962).

Overall, values are powerful tools that connect people to social groups, and fulfill a need for belongingness (Hogg & Mullin, 1999). I infer that the sharedness of values would enhance the likelihood that values are self-defining.

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Situational Accessibility of Central Values

A concept needs to become *accessible* within one's *working self-concept* in order to be embedded in people's psychological experience (Aarts & Dijksterhuis, 2003; Aquino et al., 2009; Markus & Wurf, 1987). A working self-concept, also termed phenomenal self, is people's active sense of self at a given time (Markus & Wurf, 1987). Not all components of the self are accessible at all time. Only a small subset of self-knowledge remain active in one's awareness at any time, while the remainder lying dormant (Markus & Kunda, 1986). The working self-concept needs to include values so as to affect people's thoughts, feelings and behaviors.

Centrality is an important antecedent to *accessibility* of a given concept (Krosnick, 1989). Accessible concepts are fluidly retrieved from memory, and easily activated to bear on people's judgment and action. Central concepts are likely to be chronically accessible.

Nonetheless, people's working self-concept is highly dependent on cues or information in the social environment. People can incorporate novel information that is present in a particular situation to form a sense of self. Hence, if a novel belief about an abstract idea is present, people could identify with it and include it in their working self-concept. However, this situational construction of a novel central value is not enduring since people's working self-concept is always in flux. Only if the construction of a central value is sufficiently repeated can it to be stably linked to one's self definition. Finally, while it is unlikely that people can situationally construct an entire value system, it is possible that their pre-existing value system could be activated as whole.

Thus far, I have discussed the definition, antecedent, and situationally accessibility of central values. Various features of central values all suggest that central values come with constraints.

Constraints as a Property of Central Values

The term "*constraint"* was used to describe the property of belief systems. In the seminal paper on ideological belief systems, Converse (1964, pp. 3) defined a belief system as "a configuration of ideas and attitudes in which ideas are bound together by some form of *constraints* or functional interdependence." Constraints denote predictability—knowing one component in a person's belief system would allow a reliable speculation about the presence of another component. Converse (1964) defined three types of constraints, including logical sources of constraint, psychological sources of constraint, and social sources of constraint. A highly constrained belief system would be logical, psychologically true, and harmonious with the broader social system or worldview.

I propose that central values could be similarly described as a constrained belief system. Central values are experienced as cultural truism (Maio & Olson, 1998), and fit well with other components in one's self system (Feldman, 1988). Chronically central values are less prone to fluctuation than less central concepts. Here, I describe three mechanisms that speak to the constraints of central values. First, due to the number of connections a central value has with other concepts in one's belief system, changing a central value entails shifting a myriad of other concepts as well. This embeddedness nature makes it psychologically costly to change central values. Second, the stability of central values is reinforced through behavioral mechanisms. People are likely to seek out situations that affirm their own values (Nickerson, 1998; Kappes, Harvey, Lohrenz, Montague, & Sharot, 2020). People also vigorously defend their central values when others question or deny them (Maio & Olson, 1998; Bernard, Maio, & Olson, 2003). Furthermore, because central values are typically shared with meaningful important others, this means that changing central values could strain or jeopardize one's social relationships with others.

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Psychological Benefits of Constraints

Constraints of central values are not necessarily a negative feature. On the contrary, the constraints that characterize central values are precisely the reason why central values are indispensable for psychological functioning. Central values prescribe goals, eliminate uncertainty for decision-making, and connect people to their respective social groups. Central values can profoundly influence how people perceive and relate to their social environment. Having central values helps people to decide on the best course of action to advance in life. By virtue of having values, people form a clear sense of their self-concept (Campbell, 1990; Campbell et al., 1996).

From the vantage point of central values, people simplify information processing and focus on goals in an otherwise chaotic environment. Tying values to the self therefore satisfies people's need for structure (Antonovsky 1979; Greenwald & Pratkanis, 1984; Kruglanski 1989). At the interpersonal level, central values make it possible to predict one's own or other's future thoughts, feelings, and action, and therefore enable coordination among different individuals.

Psychological Downsides of Constraints

Nonetheless, constraints as a feature of central values also indicate that people lack freedom in how they relate to their surrounding environment. Their options to think, feel, and behave differently are reduced by the activation or construction of central values (Verplanken & Holland, 2002). As a result, the salience of central values increases people's rigidity in responding to their situations. For instance, central values constrain people's perception of social happenings and prevent them from seeing a different perspective (Aquino et al., 2009). When central values are activated, people are more cognitively closed to persuasive arguments (Johnson & Eagly, 1989). Likewise, people who hold strong moral values are less

tolerant of dissimilar others and less capable of resolving conflict (Skitka et al., 2005).

Central values also offer particular behavioral scripts that lower a person's capability to adapt to ever-changing environment. Having values that constitute the self tends to limit people's thoughts and actions and therefore ultimately impede their ability to adapt to different social situations (Aarts & Dijksterhuis, 2003; Markus & Wurf, 1987).

If central values impose constraints on people's freedom, why do most people seem to hold central values and are not hampered by their constraints? What self-regulatory mechanisms are at work that allow people to enjoy the benefits of having central values while still maintaining flexibility in most social situations? One clue to solving the puzzle is the curious association between central values and people's interest in *exploration*. Below, I first define exploration, and then summarize two existing theoretical frameworks that explicate the link between values and exploration[1]. After that, I propose a novel and more general, though not incompatible, theoretical perspective on the link between central values and exploration.

Research on Exploration

The phenomenon of exploration—an active pursuit of unknown objects or situations—has been a focal research topic for a wide array of different fields (Bowlby, 1969; Kashdan & Steger, 2007; March, 1991; Schwartz & Bilsky, 1987). The literature has extensively examined different forms of exploration (Kashdan & Silvia, 2009; Tadmor et al., 2012; Zuckerman, 2007), in various contexts (Bowlby, 1969; Hirschman, 1980; Kahneman & Tversky, 2013; Scholer et al., 2010), at the individual, interpersonal, inter-group and cultural

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[1] The Basic Value Theory also suggests that people who hold values related to openness to change (e.g., stimulation, self-direction, and hedonism) are naturally drawn to exploration as doing so is value-congruent (Schwartz, 2012). Exploration is simply an authentic expression of people's values. However, the current research is concerned with the accessibility of central values regardless of the contents. Hence, I do not review the Basic Value Theory.

levels (Brown & Hewstone, 2005; Flynn, 2005; Pettigrew & Tropp, 2006; Levinthal & March, 1993; Schwartz & Bilsky, 1987).

At the individual level, exploration carries implications for various life outcomes, including cognitive development and achievement (Elliot & Reis, 2003; McCrae, 1987; Raine et al., 2002), attitude formation (Fazio, Eiser, & Shook, 2004), relationship satisfaction (Aron et al., 2000), as well as personal well-being and meaning in life (Kashdan & Steger, 2007).

In the intergroup context, exploration plays a central role in sustaining positive perceptions of out-group members (Tadmor et al., 2012). Open-minded people are more likely to attend to information that disconfirms common stereotypes and prejudices (Flynn, 2005), and therefore come to understand viewpoints that are distinct from one's own. Accumulating evidence suggests that engaging in cross-group exploration and contact-seeking is pivotal to maintaining an overall positive attitude towards out-group members (Brown & Hewstone, 2005; Pettigrew & Tropp, 2006).

In organizational settings, exploration is considered a fundamental mode of organizational behavior that entails search, experimentation, and active variation (Gupta, Smith, & Shalley, 2006; Levinthal & March, 1993; March, 1991; Miller, Zhao, & Calantone, 2006). Exploring unknown exploration is germane to organizational learning and innovation (Lavie, Stettner, & Tushman, 2010).

At the cultural level, exploration is linked to cultures that are characterized by loose rather than tight norms (Gelfand et al, 2011). When cultures afford people with ample opportunities to be in touch with the unknown without sanctioning behaviors that deviate

from norms, people tend to engage in exploratory behaviors more frequently and in general exhibit more creativity (Jackson, Gelfand, De, & Fox, 2019).

Related Constructs

Partially because exploration has been a research topic for multiple fields, the construct of exploration is related to sensation-seeking, need for stimulation, risk-taking, openness to experience, openness-to-change, curiosity, and novelty-seeking. All these terms have specific meanings that speak to different academic audiences. Some of these constructs focus on features of novel activities. For instance, sensation-seeking is characterized by experiencing affective arousal associated with novel activities (Zuckerman, 2007). Risk-seeking highlights the perceived possibility of loss or harm that comes with a certain behavior or decision (Kahneman & Tversky, 2013; Scholer et al., 2010).

Moreover, other constructs refer to a stable tendency towards change and variation, in terms of both personal traits—openness to experience (McCrae, 1987; McCrae & Sutin, 2009), and cultural beliefs—openness to change as a shared value (Schwartz & Bilsky, 1987). People who are high on trait openness to experience have a recurrent tendency to enlarge one's living experience and to examine novel stimulation (McCrae & Costa Jr, 1997). Those who hold values that encourage seeking change are more likely to step into novel situations. In addition, a construct such as "curiosity" pertains to both a specific psychological state and a lasting personal trait (Kashdan & Silvia, 2009). Finally, the construct "novelty-seeking" (Hirschman, 1980) is conceptually indistinguishable from exploration.

Current Focus: Exploration as a Domain-general Motivational State

For this dissertation, I will focus on exploration as a general motivational state at the

individual level. The concept of exploration at a motivational state describes *a desire to approach uncertain situations and objects*. A motivational state is meaningfully differentiated from a trait because it is relatively short-lived and transient (for a discussion on the conceptual distinction between *trait* and *state*, see Fridhandler, 1986). A motivational state would be de-activated following the achievement of goals. Likewise, a motivational state can be derived from psychological needs or values but tend to be more dependent on demands from the situations one is in. For instance, people who in general have a high need for personal structure can temporarily experience a desire to explore the unknown even though this motivational state and their chronic needs are incongruent. Finally, a motivational state is also different a behavior because a motivation can only manifest behaviors when situations permit so.

Exploration as a motivational state could manifest being attracted to novel stimuli (Hirschman, 1980; Zuckerman, 2007), an intent to violate social roles (Bosson, Prewitt-Freilino, & Taylor, 2005), an increased tolerance of risk (Kahneman & Tversky, 2013; Scholer et al., 2010), as well feelings of curiosity (Kashdan & Silvia, 2009). A motivation to explore may or may not give rise to actual exploratory behavior.

People's exploration of the unknown vary greatly across different domains, defined as areas of activities (Hirschman, 1980). Instead of focusing on exploration of a specific domain, I focus on a general inclination towards having more uncertainty and freedom. I argue that this domain-general, exploratory motivation is most suited for restoring the dynamism of the self-concept. This is because a domain-general motivation is easier to satisfy than a domain-specific motivation. Given the frequency with which people experience

constraints from self-concept, having a domain-free motivation could allow people more flexibility to fulfill their desire (See more detailed discussion later).

Existing Theories on Central Values and Exploration

Self-Affirmation Theory suggests that accessibility of central values offers a constructive avenue to achieve a overall positive self-image. With enhanced self-efficacy, people are better equipped to face uncertainty and engage in exploration. Another line of research on Adult Attachment Theory claims that the behavior systems of *attachment* and *exploration* are interconnected in adults (Green & Campbell, 2000). Being reminded of central values could enhance emotional connections with one's key care-giving figures. This enhanced relational resources support people's exploratory endeavors.

Below, I first introduce both theories in more details. Then I will delineate a compatible, yet novel and more general theoretical account for explaining the link between central value accessibility and exploration. I propose that a motivational state of exploration is attributable to people's reactions to constraints that characterize central values.

Self-Affirmation Theory and Exploration

Self-Affirmation Theory postulates that people are motivated to maintain the integrity of the self as well as a sense of personal adequacy (Steele, 1988). When people encounter events that threaten the view of the self being moral and competent, they are prone to enacting self-protective defenses such as being closed to change (Cohen & Sherman, 2014). Defensive responses can hinder personal growth and development. One way to reduce defensive responses is to affirm an aspect of identity in another domain that is not threatened. In this regard, central values prove to be a remedy for self-threat. Because people generally have strong, positive affective associations with values that they identify with, they can evoke central values to boost their self-image.

Fluidly switching between different domains of the self proves to be adaptive for a

vast range of circumstances. In particular, being reminded of one's central values can attenuate defensive responses by activating an expansive view on the self and restoring people's global self-worth (Cohen & Sherman, 2014). Accordingly, Self-Affirmation interventions usually ask people to write about core personal values in the face of a self-threat. Value-based affirmations, if implemented at the right moment, can cast a lasting positive impact on people's educational achievement, personal health, and social relationships (Cohen & Sherman, 2014; Epton & Harris, 2008).

Adult Attachment Theory and Exploration

According to Adult Attachment Theory, people are naturally oriented towards learning and exploration. However, they are deterred by uncertainty in the social environment. Hence, a precursor to exploration is feelings of safety, which comes from feeling cared for by one's attachment figures (e.g., close friends or romantic partners). Hence, secure attachment could offer protection and support to assuage stress and fear. This enriched relational resources enable and facilitate people to explore the unknown. This theorization has received converging empirical support. Research found that chronical or contextually induced secure attachment style, as opposed to avoidant and anxious attachment styles, predicted greater openness for exploring one's physical, social, and intellectual environments (Green & Campbell, 2000).

Central values are rooted in one's social relationships. As established before, values that are shared with others are more likely to be constitutive of the self. Hence, when central values become accessible in any given moment, they also make salient people's relationships with important attachment figures, which unleashes exploration.

A Summary and Analysis of Existing Theories

Both Self-Affirmation Theory and Attachment Theory share two common

characteristics. First, both theories make assumptions about people's pre-existing or innate tendency towards growth and change. Self-Affirmation Theory stipulates that situational accessibility of central values serves to un-inhibit a course of action (i.e., personal change and growth) that would have happened had there not been any self-threat. Likewise, Attachment Theory posits that relational resources mitigate perceived uncertainty in the environment and thus unleash people's pre-existing desire to learn and grow. Second, both theories also are primarily concerned with situations wherein people are already exposed to uncertainty. Self-Affirmation Theory suggests that accessibility of core values reduces self-defensive responses in the face of self-threat, which denies and makes uncertain one's self-worth. Adult Attachment Theory treats relational resources as a buffer against potentially debilitating uncertainty, risk or chaos in the surrounding environment. Uncertainty is treated as threatening and something to eliminate.

I propose an alternative, broader account for explicating the curious link between accessibility of central values and exploration. This proposed account are distinct from both the Self-Affirmation Theory and Adult Attachment Theory in two meaningful ways. First, the two theories suggest that central values would facilitate or disinhibit pre-existing tendency towards exploration, rather than cause a motivation for exploration. By comparison, I do not assume that people have an unconditional or inherent propensity for greater openness for exploration. Instead, I argue having too much constraints due to central values can cause a motivational state of exploration. Second, my proposed account based on constraints of central values is more general in scope, and do not hinge on situations of uncertainty or threat. Instead, I attempt to include circumstances in which people are not facing threat or uncertainty. I suggest that an overall tendency towards to keeping both the stability and

dynamism of the self can adequately explain the interconnection between central value accessibility and exploration.

Proposed Theory: Exploration as Reactions to Constraints of Central Values

People often enact behaviors to restore their feelings of freedom. Research on psychological reactance, for example, suggests that people who perceive that their freedom is threatened tend to engage in behaviors to assert their personal control or freedom (Brehm & Brehm, 2013). Feeling constrained could also motivate people to explore the unknown to reconnect with the dynamic aspect of the self and therefore reinstate feelings of freedom. Research showed that people (e.g., mountaineers) who felt constrained by everyday routines intentionally sought out situations of chaos, risk and uncertainty to preserve a sense of the self as active (Barlow, Woodman, & Hardy, 2013).

A state of exploration is a remedy for lessening rigidity of the self. Early researchers of openness to experience described "absorption" —a psychological state in which people were immersed in potentially "*self-altering* experience" through active imagination, hypnotization, day-dreaming or fantasy (Crawford, 1982; Tellegen & Atkinson, 1974). Exploration helps people to feel dissociated from the current sense of self. For example, a common hallmark of exploration is artistic endeavors. At the peak of artistic engagement, people achieve a sense of flow in which they forget their psychological experience as well as their sense of self (Csikszentmihalyi & Csikzentmihaly, 1990). This self-diminishing experience allows people be free from current conception of the self, and thereby opens up new possibilities for them to feel, think and behave in novel and unexpected ways.

In essence, exploration impart uncertainty to the self-concept, and counteract the

constraints of central values. A constellation of exploratory activities such as fantasizing, creative expressions, or risk-taking could all increase people exposure to uncertainty, and thereby rejuvenate self-concept malleability. Ultimately, people could preserve a balance between stability and dynamism within their self-concept.

People's General Psychological Tendency towards Balance

I use the term "balance" to indicate that people gravitate towards a certain psychological state where they feel most comfortable. When they deviate from this state, they experience a tendency to return to it. The idea about balance has a long history in social psychological theories. Early theorists applied the idea about balance to describe a given social or psychological system. Lewin (1947) envisaged a "quasi-stationary social equilibria" to capture the complexity of group dynamics. Heider's Balance Theory (1946) conceptualized that the cognitive consistency motive was a potent contributing factor towards reaching a psychologically balanced state wherein the affective valences of concepts yielded a positive result. Adult Attachment Theory was initially constructed on the premise that people have multiple, interconnected motivational-behavioral systems which forms a "homeostasis" that people are motivated to maintain (Bretherton, 1992).

Well-being is also considered a general state of psychological balance. Research suggested that people's well-being usually returned to an equilibrium level or a baseline following major influential events such as becoming paraplegic or winning a lottery (Brickman, Coates, & Janoff-Bulman, 1978). The dynamic equilibrium model of well-being was proposed to examine the stability and change in people's levels of subjective well-being (Headey & Wearing, 1989).

The idea about balance is also applied to specific psychological state. Sternberg (1998) proposed a balance theory of wisdom, which defined wisdom as achieving a balance among multiple intrapersonal, interpersonal, and extra-personal interests in order to achieve a

balance among adaptation to existing environments, shaping of existing environments, and selection of new environments.

Balance is also observed in how people navigate their social relationships and identities. Optimal Distinctiveness Theory proposes that people prefer to belong to a group that simultaneously satisfies their needs for affiliation and their needs for being unique individuals (Brewer, 1991). This orientation towards achieving a balance between different psychological needs manifests not only in people's relationships with their groups but also in dyadic relationships (Slotter, Duffy & Gardner 2014). In fact, the Personal-Relational Equilibrium Model suggests that people seek to balance allocating time and resources to social relational concerns and to personal development goals (Kumashiro, Rusbult, & Finkel, 2008).

The idea about balance seems to be the nexus of research findings regarding a potential hydraulic relation between people's experience of constraint/structure and freedom. When there is too much or too little constraint in life, people attempt to restore the balance by orientating themselves towards the opposite side of what is excessive at this moment. For example, people assert their freedom when they face too many constraints in a situation (Brehm & Brehm; 2013). Conversely, people make quicker decisions to eliminate uncertainty when they are faced with too many choices (Scheibehenne, Greifeneder & Todd, 2010). They also are more likely to uphold familiar cultural beliefs when being exposed to chaos in the environment (Dechesne et al., 2003; Greenberg et al., 1990).

Drawing on various theories and findings in the literature, I argue that people may also have a certain level of stability and dynamism in the self-concept that they feel most comfortable with. When they deviate from that balanced state, they are motivated to return to it. This means that when people's self-concept becomes too stable, they desire to increase its dynamism, and vice versa.

Balancing the Stability and Dynamism in the Self:

Rethink The Link between Central Values and Exploration

The self is not only continuous and stable over time (Baumgardner, 1990), but is also "active, forceable, and capable of change" (p.299, Markus & Wurf, 1987). Scholars have generally accorded the self-concept both stability and dynamism (James, 1890; Markus & Wurf, 1987; See Tables 1-2 for summaries of relevant theories and research findings on the dual features of self-concept respectively). In general, both features of the self are predictive of psychological adjustment and well-being in life (Cheng, 2003; Pelham, 1991). Thus, it seems reasonable to suggest that people want to preserve both the stability and dynamism of their self-concept.

At a more concrete level, accessibility of central values increases the stability of the self-concept at the expense of its dynamism. This could cause people to counter the constraints of central values, which manifests a motivation to engage in exploration.

Overview and Predictions

The main objective of the empirical research is to investigate how people manage the benefits of having beliefs as their core self-conception while mitigating its downsides. I put forth two hypotheses. First, I propose that situational accessibility of central values predicts a general interest in exploration. Second, I predict the values that are shared by one's in-group members are more likely to be central values.

I report five empirical studies that tested these theoretical predictions. In Study 1a, using a community college student sample, I find evidence that situational activation of central values predicts a general interest in exploration. In Study 1b, I replicate the effect using situational construction a different set of novel values and a sample of employees working in a German chemicals company. In Study 2, I manipulate accessibility of central values by using an evaluation of value change paradigm and find an indirect effect of central values on exploration. In Study 3, I replicate the indirect effect in Study 2 using a different paradigm for manipulating the accessibility of central values. I also find that an interest in exploration in turn predicts actual risk-taking behaviors (i.e., choosing more risky options of payment).

In Study 4, I discover an antecedent to central values: the extent to which a value is shared by one's in-group members. I recruit alumni from a large west-coast university who volunteered to participate in the survey. Similar to the findings in my previous studies, a significant indirect effect emerges. Participants whose (situationally constructed) values are shared indicate that the values are more defining of their self-concept and subsequently are more interested in exploration. Data and study materials for all studies are available at: https://osf.io/nkymu/?view_only=124d44e848914c01b02d94715ec4e221

Study 1a

In the first study, I tested if activation of existing central values predicts people's interest in exploration. To do so, I employed a writing task asking participants to list their values, defined as beliefs about what was important in life. Consistent with prior conceptualization, Study 1a focused on accessibility of a value system rather than that of discrete values.

Method

Participants

235 students from two community colleges participated in the study in exchange for receiving .5 credit for a class that they enrolled in. Of these, 23 failed attention checks and were excluded from data analysis. Overall, responses from 212 participants (55 men, 157 women, $M_{age} = 23.3$) were included in the subsequent analyses.

Materials and Procedure

Participants first were instructed to use a few sentences to briefly write down their personal values (i.e., their beliefs about what is important in life). They were asked to use around 300-900 characters (around 60-180 words) in response to this question. They then were required to spend at least 1 minute on the writing task but can spend more time on it if needed. After completing the writing task, participants proceeded to the next page where their own statements were presented to them. Then they were asked to indicate the extent to which these beliefs defined their sense of self. After that, participants reported their interest in exploration.

To examine the correlates of my two key variables (i.e., accessibility of central values and interest in exploration), I also asked participants to complete measures of self-certainty, openness to experience, need to belong, need for structure, as well as perceptions of societal level certainty. Finally, participants reported their basic demographic information including

subjective socio-economic status (SES), age, gender, ethnicity, household income, and political orientation. After completing the survey, participants received .5 credit for their participation. For exploratory purposes, I also measured perceived social support and horizontal individualism. See supplemental materials for measures of these two variables.

Accessibility of Central values. I developed a three-item composite measure: (To what extent do your beliefs)[2] "describe you well as a person", "capture the essence of how you see yourself as a person", and "define your identity?" Participants responded to these questions on a 5-pt. scale (1 = *not at all* and 5 = *extremely*), and these items formed a reliable composite of accessibility of central values (α = .82).

Interest in exploration. I constructed a five-item composite measure of an interest in exploration based on the two-item measure of valuing stimulation ("Adventure and risk-taking is important to me", "To live an exciting life is important to me") from the World Value Survey (http://www.worldvaluessurvey.org/wvs.jsp). Participants were asked "Given the choice, how interested are you in doing the following things?" They were explicitly instructed to focus on what they wanted to do when answering these questions. The five items for measuring interest in exploration were: "To have new and exciting experiences", "To explore the unknown", "To take risks", "To go on an adventure," and "To follow routines (r)". Participants answered these questions on a 5-pt. scale (1 = *not at all*, and 5 = *extremely*). These items formed a reliable measure of interest in exploration (α = .76).

Self-certainty. I used a six-item measure of self-certainty from Hohman & Hogg (2015). The six items were: " I have a clear sense of who I am", "I am unsure about the opinion I have for myself (r)", "I have a clear understanding of my personality", "I know my place in the world", "I am uncertain about what my future holds (r)", and "If I were asked to

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[2] In empirical studies, I used the term "belief" and "value" as inter-changeably since I defined values as "beliefs about what is important in life."

describe who I am, I could easily". Participants answered these questions on a 7-pt. scale (1 = *strongly disagree*, and 7 = *strongly agree*). These items formed a reliable measure (α = .80).

Openness to experience. I used the openness-to-experience factor from the Big Five Inventory (BFI) (John & Srivastava, 1999). The items about aesthetics were not relevant to the current research and were not included. As a result, a seven-item measure was used. Participants answered the questions: *I see myself as someone who...* "Is original, comes up with new ideas", "Is curious about many different things", "Is ingenious, a deep thinker", "Has an active imagination", "Is inventive", "Prefers work that is routine", "Likes to reflect, play with ideas". Participants answered these questions on a 7-pt. scale (1 = *strongly disagree*, and 7 = *strongly agree*). Together these items formed a reliable composite measure of openness to experience (α = .76).

Personal need for structure. A four-item measure was used (Neuberg & Newsom, 1993), which included: "I enjoy having a clear and structured mode of life", "I like to have a place for everything and everything in its place", "I find that a well-ordered life with regular hours makes my life tedious (r)", "I find that a consistent routine enables me to enjoy life more". Participants answered these questions on a 6-pt. scale (1 = *strongly disagree*, and 6 = *strongly agree*). Reliability analysis showed that the four items did not hang together (α = .60). Nonetheless, dropping the reverse-coded item formed a more reliable composite (α = .76). Therefore, the three-item measure was used in subsequent analyses.

Need to belong. I used a four-item measure from Leary, Kelly, Cottrell, & Schreindorfer (2013): "I seldom worry about whether other people care about me (r)", "I need to feel that there are people I can turn to in times of need", "I want other people to accept me", "I do not like being alone", and "I have a strong need to belong". Participants answered these questions on a 5-pt. scale (1 = *not at all*, and 5 = *extremely*). These items formed a reliable measure (α = .73).

Perceived societal certainty. I constructed three items to measure people's perception about the level of societal uncertainty. The three items were: "We live in a time of uncertainty (r)", "Society is in flux (r)", and "Society is heading towards an uncertain future (r)". Participants answered these questions on a 7-pt. scale (1 = *strongly disagree*, and 7 = *strongly agree*). Together these items formed a reliable composite (α = .84).

Attention check question. I also included one attention check question that was embedded in the composite measure of perceived social support. The attention-check question simply instructed participants that "This is an attention check question. Please select 'Somewhat disagree'."

Results

Accessibility of Central Values and Exploration

As predicted, central values was positively correlated with a general interest in exploration, $r(210) = .16$, $p = .018$. This finding suggested that the more participants' sense of self was defined by values, the more they were attracted to exploration of the unknown.

Other analyses

I also found that accessibility of central values was positively correlated with self-concept certainty, $r(210) = .37$, $p < .001$. This correlational result affirmed my theoretical claim that defining one's self-concept based on values was likely to increase the stability of the self. The more people constructed their sense of self based on values, the more structure they had in their self-concept.

Furthermore, self-certainty was also positively correlated with an interest in exploration, $r(210) = .17$, $p = .01$. Nonetheless, certainty about the global social environment had a trending negative correlation with an interest in exploration, $r(210) = -.13$, $p = .05$. This suggested that the relationship between having structure and interest in exploration was

specific to *internalized structure within the self-concept*, rather than perceptions about the level of structure in the social environment.

I also found that interest in exploration correlated positively with openness to experience, $r(210) = 0.48$, $p < .001$, and negatively with personal need for structure $r(210) = -0.29$, $p < .001$. Yet, interest in exploration didn't correlate with need to belong, $r(210) = 0.04$, $p = .60$. Altogether, this set of results suggested that the measure of interest in exploration showed good convergent and divergent validity. Correlations among selected variables are presented in Table 3.

Insert Table 3 here

Discussion

In Study 1a, I developed valid and reliable measures of both the independent and dependent variables (i.e., accessibility of central values and interest in exploration), and found a positive correlation between these two variables. Furthermore, accessibility of central values positively correlated with self-certainty, thereby supporting my theoretical claim that activating central values would enhance the level of stability of the self. Taken together, these findings offered initial proof that an increased level of stability within the self would tip the self towards needing uncertainty via exploration.

In Study 1a, participants made an overarching judgment regarding if their values, regardless of the contents, were defining of their sense of self. As long as the values were defining of their sense of self, I would expect participants to experience a desire for exploration. Nonetheless, it would be important to cleanly show that this finding would generalize to other sets of values. I sought to replicate the findings in Study 1b.

Study 1b

In this study, I aimed to replicate the finding in Study 1a and examine if I would observe a similar effect by using situational construction of novel values. Towards that end, I collaborated with an international non-profit organization that administered a survey to understand the impact of social entrepreneurship initiatives on employees' motivation and behaviors at work. I leveraged the purpose of this survey to investigate if people could construct a sense of self based on their values regarding the relative importance of business organizations to solve social problems versus making profits.

Method

Participants

234 full-time employees from a big German chemicals company completed the survey. Of these, 152 participants (129 men, 19 women, 4 undisclosed, 52% of the participants reported as between 31-40 year old; see supplemental materials for specific breakdown of the age groups of participants) passed the attention checks and their responses were included in the subsequent analyses.

Materials and Procedure

I partnered with a non-profit organization that further collaborated with a German chemicals company to recruit their employees to complete a survey regarding the effect of social business initiatives. I added two questions about accessibility of central values and interest in exploration as parts of their survey. First, participants were instructed to indicate the extent to which two different values were defining of who they were. These two values were for business to maximize revenue ("Business should maximize financial gains") and for business to solve social problems ("Business should play an active and direct role in solving social problems."). After that, they also reported their interest in exploration.

Accessibility of central values. I used the same measure as in Study 1a. I measured

this variable using two values (i.e., revenue maximization and social problem-solving) (α

= .78 and .85 respectively).

Interest in exploration. I used the same measure in Study 1a (α = .71).

Results

Accessibility of central values and interest in exploration

In Study 1b, I found that accessibility of central values again predicted an interest in exploration. This held true for the value that business should maximize profits, $r(150) = .28$, $p < .001$, and for the value that business should actively solve social problems, $r(150) = .34$, $p < .001$.

Discussion

In Study 1b, I used two different values related to the role of business in maximizing revenue or solving social problems as the basis for participants to construct their sense of self. In doing so, I replicated my findings in Study 1a and find that accessibility of central values again predicted an interest in exploration.

Thus far, my findings in Studies 1a and 1b were correlational in nature, and would not allow me to make causal claims regarding the directionality of the finding. In Study 2, I aimed to recruit a different sample and manipulate obtaining or losing values as part of one's self-concept and test its relationships with an interest in exploration.

Study 2

In Study 2, I manipulated accessibility of central values by asking people to describe an experience in which they either obtained or lost a value. I reasoned that obtaining a value would be tantamount to constructing the self while losing a value entailed attenuating the self. Hence, when participants mentally relived the time when they constructed a sense of self based on values, this would increase the accessibility of central values and tilt the self towards desiring exploration. I expected that the opposite would be true for those who were

reminded of an experience in which they lost a value: the inaccessibility of central values would draw the self towards wanting stability and therefore decrease an interest in exploration.

Method

Participants

299 American adult participants who passed the initial online bot check and a basic English comprehension test[3] were recruited from Turkprime to participate in a 10-minute survey. Of all participants who completed the survey, 43 failed attention checks/did not answer the essay question regarding their personal values. So responses from a total of 256 participants (141 men, 114 women, 1 other, $M_{age} = 37.7$) were included in the subsequent analyses.

Materials and Procedure

I randomly assigned participants into one of two conditions: obtaining or losing a value. In the "obtaining a value" condition, participants were asked to describe a personal value that was becoming more defining of their sense of self. In the "losing a value" condition, participants were instructed to describe a value that was less defining of who they were. Participants in both conditions were asked to use around 300-900 characters (around 60-180 words) in response to this question. They were required to spend at least 1 minute on the writing task but can spend more time on it if needed.

After completing the writing task, participants proceeded to the next page where their statements were presented to them. Then they were asked to indicate how much a specific value was defining of their sense of self. Participants then reported their sense of self-certainty, and interest in exploration. They also completed measures of openness to experience, perceived social support, and need for structure, as well as perceptions of societal

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[3] The texts for all screening questions are included in the supplemental material section.

level certainty. I also collected participants' basic demographic information including subjective socio-economic status (SES), age, gender, ethnicity, household income, and political orientation. After completing the survey, each participant received $1.2 as payment for their participation.

Manipulation of value change. Consistent with previous studies, I focused on values, defined as beliefs about what is important. Participants in both conditions were asked to describe a personal value change based on the following instructions:

"*A personal value is something you believe is important in life. Personal beliefs may change over time. In a few sentences, please briefly write down a belief that is **more and more [less and less]** central to you as a person. Describe how it feels like when a belief is becoming **more [less]** central to you. There are no right or wrong answers to this question.*"

Measures. I administered the same measures of accessibility of central values, interest in exploration, and self-certainty as in Study 1a (αs = .95, .78, and .90, respectively), as well as the same individual differences measures about perceived social support, openness to experience, personal need for structure, and societal level certainty (αs = .87, .83, 70, and .90, respectively).

Results

Manipulation Check

Participants who described the experience of obtaining a value indicated that the particular value was more defining of their self-concept ($M = 4.11$, $SD = .07$) than those who described the experience of losing a value ($M = 3.11$, $SD = .11$), $t(254) = 7.92$, $p < .001$. This suggested that the manipulation of the accessibility of central values was successful.

Main Effect

I did not find a main effect of the salience of obtaining or losing value on an interest

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in exploration, $t(254) = -1.16$, $p = .25$.

Mediation Analyses

I examined whether accessibility of central values would mediate the effect of salience of value change manipulation (obtaining a value = 1; losing a value = 0) on an interest in exploration, using "Lavaan" package in R (Rosseel, 2012). Standardized indirect effects were computed for each of 5000 bootstrapped samples. The bootstrapped standardized indirect effect was .17, and CI 95% = [.04, .32]. Thus, the indirect effect was significant: to the extent that participants were reminded that a specific value became more defining of their sense of self, they were more inclined to explore exploration.

After controlling for the indirect effect, the direct effect of salience of value change on interest in exploration became significant. The bootstrapped standardized direct effect was -.31, CI 95% = [-.58, -.04], which suggests that our manipulation of salience of value change (obtaining a value = 1; losing a value = 0) had an unexpected, negative effect on an interest in exploration, after controlling for accessibility of central values. Figure 1 summarizes the results of the mediation analyses.

Insert Figure 1 here

Discussion

In Study 2, using a writing task, I leveraged people's past psychological experience in order to test the impact of situational activation of central values on exploration. I reasoned that compared with losing a personal value, obtaining a self-defining value would increase the stability of the self and thereby tip the self towards desiring exploration. Consistent with this theorizing, I found an indirect effect of obtaining self-defining value on interest in exploration: to the extent that people were in a state of mind in which they obtained a value

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(and thereby constructed a sense of self based on values), they showed a stronger interest in exploration.

Nonetheless, after controlling for accessibility of central values, I unexpectedly found a negative direct effect of obtaining a value on an interest in exploration, indicating a suppressor effect such that my manipulation of value change also impacted another hidden variable that affected people's interest in exploration in the opposite direction. I returned to the suppressor effect in the general discussion.

Study 3

In Study 3, I planned to manipulate accessibility of central values with a different paradigm to replicate the effect in Study 2. Besides, I aimed to examine a downstream behavioral consequence: risk-taking.

Method

Participants

361 American adult participants were recruited from Turkprime to complete the survey. All these participants passed bot checks and an English comprehension question in the beginning of the survey (see supplemental materials for texts). Of those, 319 participants (185 men, 133 women, and 1 other, $M_{age} = 36.9$) passed the attention check and provided meaningful responses to the written question. Responses from these participants were included in subsequent analyses.

Materials and Procedure

Participants were first instructed to briefly describe their personal value, defined as what they believed to be important in life. They were asked to use between 30-200 words in response to this question. After that, participants were told that they would read a key finding based on social science research, which would help them understand how values were related to personal identity.

Manipulation. I randomly assigned participants into one of two conditions: "accessibility of central values" and "the inaccessibility of central values." Participants read the following texts:

Do Your Beliefs Define You?

Decades of research has found that beliefs are **[not]** the core of personal identity. Personal identity is **[difficult to define]** defined by beliefs alone. Beliefs are sufficient **[insufficient]** to capture the essence of a person.

After reading the texts, participants were presented with their own statement of values. They then completed a measure of accessibility of central values and their interest in exploration as well as a behavioral measure of risk-taking. After completing the survey, participants were fully debriefed about the purpose and the manipulation of this study (see supplemental materials for the debrief). They then received $1.2 as payments plus a bonus based on their choice (see the risk-taking measure below).

Accessibility of central values and interest in exploration. I used the same measures as in previous studies (αs = .90 and .81 respectively).

Risk-taking. I adapted a measure from Holt & Laury (2002) and used participants' choice of their own bonus as a measure of risk-taking behavior. Participants were told that in addition to the guaranteed $1.2 payment, they would also receive additional bonus for participating in this survey. They learned that their bonus payment would be based on a lottery. They were asked to indicate which option they would prefer in each of the ten questions and that their final bonus payment would be randomly selected from all the options that they selected.

Participants were asked to make sure each option that they chose would represent

what they wanted and that there were no right or wrong answers to these questions. In nine of the ten questions, they were asked to choose between one of the two options: either a safe option of getting a relatively smaller amount of bonus or a risky option of getting a bigger amount of bonus. The tenth question offered either an option of 100% chance of getting a larger amount of bonus or another option of 100% chance of getting a smaller amount of bonus. This question was not indicative of risk-taking tendency, and hence was not included in the analysis. I summed up nine of participants' choices of risky payments as a measure of risk-taking. See supplemental materials for the ten questions.

Results

Manipulation Check

Participants who read the research summary that values were defining of who they were indicated that their value was more defining of their self-concept ($M = 4.05$, $SD = .77$) than those who read the research summary that values were not defining of who they were ($M = 3.62$, $SD = .94$), $t(317) = 4.42$, $p < .001$. This suggested that my manipulation of the accessibility of central values was successful.

Main Effect

I did not find a main effect of the manipulation on an interest in exploration, $t(317) = .02$, $p = .98$.

Mediation Analyses

I examined whether accessibility of central values would mediate the effect of the manipulation ("accessibility of central values" = 1; "inaccessibility of central values" = 0) on an interest in exploration, using "Lavaan" package in R (Rosseel, 2012). Standardized indirect effects were computed for each of 5000 bootstrapped samples. The bootstrapped standardized indirect effect was .11, and CI 95% = [.05, .20]. Thus, the indirect effect was

significant: to the extent that participants' central values was accessible, they were more interested in having exploration.

After controlling for the indirect effect, the direct effect of the manipulation on interest in exploration remained non-significant. The bootstrapped standardized direct effect was -.11, CI 95% = [-.32, .11]. Figure 2 summarized the results of the mediation analyses.

In addition, I also constructed a serial mediation model to test if centrality of values to the self would lead to behavioral risk-taking, using "Lavaan" package in R (Rosseel, 2012). Standardized indirect effects were computed for each of 5000 bootstrapped samples. The bootstrapped standardized indirect effect was .03, and CI 95% = [.005, .065]. Thus, the indirect effect was significant: to the extent that participants could construct a sense of self based on values, they were more interested in having exploration, and more likely to take risks. Figure 3 summarized the results of the serial mediation analyses.

Insert Figures 2-3 here

Discussion

In Study 3, I employed a different manipulation of accessibility of central values by directly affirming or denying that values were defining of people's sense of self. In doing so, I discovered an indirect effect of accessibility of central values on an interest in exploration and thus replicated findings in previous studies. I also found that accessibility of central values eventually predicted risk-taking behaviors (e.g., choosing more risky options of bonus). In the meantime, I did not find a direct effect of accessibility of central values on an interest in exploration. This suggested that either my manipulation of accessibility of central values was not strong enough or there was an unknown suppressor that muted the effect.

Study 4

In Study 4, I planned to uncover an antecedent of accessibility of central values by manipulating perceptions about if a value was shared by one's in-group members or not. Towards that end, I recruited a sample of university alumni to participate in our survey. For the sake of generalizability, I chose a set of different values (i.e., equity vs. equality) to further test that the contents of values would not matter for constructing one's sense of self. I predicted that sharedness of a value would lead to the construction of accessibility of central values and therefore cause an interest in exploration.

Methods

Participants

237 alumni from a large, prestigious west-coast university volunteered to participate in the survey. Of these, 220 participants (106 men, 114 women, Mage = 59.3) passed both the attention check and manipulation check and their responses were included in the subsequent analyses.

Materials and Procedure

In the introduction section of the survey, participants were informed that they would participate in a "X University alumni value survey," and that their responses would be recorded and became part of the "X University alumni value database." Participants then provided basic information regarding the year they graduated from X University, the type of degree received, and their academic area. This introduction was designed to make it believable when the survey later presented findings about if a participant's value was shared or not shared by their fellow alumni cohort.

After the introduction, participants proceeded to read the descriptions of two different kinds of values: equity and equality. They were asked to first write a short paragraph to explain if they believed "equity" or "equality" was more important to them. After that,

participants received the message that the researchers would share a finding based on the alumni value survey in return for their participation. The "finding" was the experimental manipulation of the sharedness of a chosen value. Participants were randomly assigned into one of the two conditions: "value shared" or "value unshared." Upon receiving this feedback, a manipulation check was used to ensure that participants properly received the information about the sharedness (or lack thereof) of their value. They also completed a measure of relational closeness to their fellow alumni cohort.

After the manipulation, participants indicated how much their chosen value was defining of their sense of self. For exploratory purposes, participants also reported how malleable their values were to change and the extent to which their values would predict their behaviors. After that, participants completed a measure of an interest in exploration as the dependent variable. In addition, they reported their perceived social support and need to belong. Furthermore, participants continued to complete a filler task before completing a measure of group identification with their alumni cohort. They also reported how surprised they were by the fact that either their values were shared or not shared. Participants then completed a measure of horizontal individualism and collectivism, as well as a need for uniqueness measure.

In the demographics section, participants reported subjective socio-economic status (SES), age, gender, ethnicity, household income, and political orientation. Additionally, participants were asked if they took breaks during taking the survey or not and if they did take breaks what activities they did. Finally, participants were fully debriefed about the purpose of the survey. See supplemental materials for measures about exploratory variables and the debrief.

Manipulation of the sharedness of a value. In the "value shared" condition,

participants were informed that the majority of the university alumni from their cohorts chose the same value regarding equity or equality. In the "value unshared" condition, participants learned that the majority of alumni from their cohorts chose a different value from theirs. In both conditions, participants were told that the alumni cohort referred to those who were in the same academic area and degree program as them.

Accessibility of central values, interest in exploration, social support, horizontal individualism, and need to belong. I used the same measures as in prior studies (αs = .90, .81, .75, .74, and .69 respectively).

Attention check question. One attention check question was embedded in the composite of value malleability, which instructed participants that "This is an attention check question. Please select 'Strongly agree'."

Results

Main effects

Participants who learned that their values were shared by their fellow cohort alumni subsequently indicated that the value was more defining of their sense of self than those who learned that their values weren't shared, $t(219) = -2.86$, p < .01.

This finding suggested that accessibility of central values was rather sensitive to how one's values aligned with those of in-group members. Moreover, the manipulation did not have an effect on the malleability of values, $t(219) = .64$, $p = .10$ or on the behavior-value consistency, $t(219) = -.38$, $p = .70$. This showed that the manipulation specifically affected accessibility of central values, but not other dimensions regarding the value.

I did not find an effect of the value sharedness manipulation on interest in exploration, $t(219) = .48$, $p = .63$.

Mediation Analyses

A bootstrapping analysis of mediation (Preacher & Hayes, 2008) with 5,000

resamples with replacement revealed a significant indirect effect of the value sharedness manipulation ("value shared" = 1; "value unshared" = 0) on interest in exploration, via accessibility of central values, CI 95% = [-.15, -.01]: to the extent that people constructed accessibility of central values as a result of learning that their fellow in-group members shared their values, they were more inclined to pursue exploration. Figure 4 showed the mediation model below.

Insert Figure 4 here

Discussion

In Study 4, I found that central values actually hinged on the value being shared by one's ingroup members, which in turn affected their interest in exploration. This finding suggested that central values could connect people to their respective groups. My findings thus shed light on the nature and origin of the self-concept defined by values: the self that is constructed via values is intimately connected to social groups that one belongs to. Contrary to the common conception that the self is a personal asset, I show that the self-concept results from social connections.

General Discussion

Values are crucial for people to navigate everyday life. We form and communicate values to others so as to make a statement of our stances or goals. We also constantly learn about others' values in order to properly engage in social interactions. Given their prevalence and importance, values are readily a basis for people to form a sense of self (Aquino et al., 2009). Once values are linked to people's self-definition, they are fluidly retrieved from memory and frequently evoked to inform sense-making and decision-making all at the same time (Verplanken & Holland, 2002). More specifically, I argue that accessibility of central values is an important indicator for how *well-structured* one's self-concept is. A well-structured self is one that is internally coherent and temporarily stable (Campbell, 1990; Campbell et al., 1996). When one's self-concept is highly structured, people may feel that there is an underlying essence for who they are as a person, making their sense of self akin to an entity (Christy et al., 2019).

Having values confers a myriad of psychological benefits. The more people base their own self-definition on concrete ideas, the more structure they enjoy in constructing their psychological experience. People who speak from their values tend to feel authentic (Christy et al., 2019; Erickson, 1995), and have a higher level of well-being in life (Ritchie et al., 2011). Those who act on their values imbue their behaviors and actions with meaning (Schlegel, Hicks, Arndt & King, 2009), because their behaviors are not random but rather are predictable expressions of their underlying sense of self (Aaker, 1999). Moreover, having clear values that one could fall back on help people to pursue goals and mitigate uncertainty surrounding the future (Schunk, 1990). At the group level, a sense of certainty arising from having central values enables people to find connections with others who hold similar beliefs and therefore galvanize group-based or collective actions (Garrison, 1992).

While central values are functional on multiple accounts, doing so also imposes a

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constraint on people's self-concept. As much as people desire stability in forming a sense of self, they are also responsive to the ever-changing environment. Decades of research has documented the dynamic nature of one's self-concept as well (Markus & Wurf, 1987; Pelham, 1991). People construct a sense of self with the information they gather from a social situation they are in (Rhodewalt & Agustsdottir, 1986; Schlenker, 1985). They activate different aspects of the self to seamlessly transition from one episode of social interaction to another one (Collins, 2014). Hence, given the constraints that come with grounding one's sense of self in values, people conceivably also desire to maintain the dynamism of the self.

In this dissertation, I propose that people seek to balance the stability and dynamism of the self. I suggest that constructing a sense of self based on values could lead people to subsequently desire to be open to exploration. This general tendency towards maintaining a balance between the dual features of the self-concept is ultimately psychologically adaptive. Through a series of five experiments, I find initial empirical evidence in support of this theoretical proposition using a variety of different samples, including college students, employees, online samples, and university alumni. A positive association between accessibility of central values and an interest in exploration holds across multiple contexts with different values, including discrete values and value systems. Moreover, I also demonstrate a behavioral consequence of accessibility of central values. Participants who construct a sense of self based on values have a higher level of interest in exploration, which in turn predicts their risk-taking behavior.

Finally, I show one important antecedent to having self-defining values: the sharedness of values by one's ingroup members. Contrary to the popular perception that values are "personal" and represents individuals, people are more likely to link values to their sense of self when values are socially shared by important others. This social nature of value-based self-concept provides a glimpse into where people ultimately acquire their

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psychological sense of structure: through their social relationships with others. Values are powerful instruments that effectively connect individuals to their social groups.

Theoretical Contribution

My dissertation work makes several important contributions to the literature on self-concept maintenance and the social function of values.

Balancing the Stability and Dynamism of Self-concept

Previous research has offered abundant evidence that self-concept has dual features of being stable and dynamic (Markus & Wurf, 1987; Pelham, 1991). Nonetheless, different scholars generally focus on different aspects of the self-concept. Research on personality psychology, Social Identity Theory, self-concept clarity, self-essentialism, Self-verification Theory and worldview confirmation, for example, generally underscores people's tendency to seek stability and certainty. According to this body of work, one might form the impression that people always seek to increase the structuredness of their self-concept. After all, having a well-defined sense of self is generally associated with positive life outcomes.

On the other hand, research on Symbolic Interaction, phenomenal self, possible self, and Self Expansion Theory, Self-Affirmation and meaning maintenance focuses on the dynamic nature of the self. Scholars from this tradition emphasize that the self is capable of change and always situated in social interactions. Reading this body of literature would cause an impression that the self is always fluid and there is no need to maintain the malleability of the self.

Although scholars have reached consensus regarding the dual aspects of the self, neither bodies of literature have provided sufficient answers to the crucial question of how the stability and dynamism of the self is maintained. In this dissertation, I test if people exhibit a tendency to balance both features of the self. By giving people an experience of constructing their sense of self via concrete values, I find evidence that centrality of values to

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one's self-definition predicts an interest in exploration and even risk-taking behaviors. Although still preliminary, this set of studies shed light on the complex nature of self-concept maintenance. My hope is that this work could encourage more research endeavors to map the interplay between self-concept stability and malleability.

The Social Functions of Values

Most research on values so far has focused on the *contents* of values and use the contents of values to predict people's motivation and behaviors. For instance, research find that people's values about sustainability are more likely to predict their actual pro-environmental behaviors when values are defining of their self-concept rather than when people merely agree with statements about the importance of sustainability (Verplanken & Holland, 2002). Likewise, particular contents of moral principles are likely to predict attitudes that are consistent with such contents. As an example, political conservatives demonstrate more support for sustainability-related policies when environmental sustainability is framed in terms of purity or duty for the nation, which are contents of moral values that conservatives associate themselves with (Feinberg & Willer, 2013).

My research departs from the conventional research focus on the contents of values and instead examine the consequences of values on people's self-concept regardless of the contents of particular values. I argue that values can be an anchor for how one defines who they are. I examine a variety of values including personal values in life, perceived priorities for business organizations, equity versus equality, and so on. I also manipulate accessibility of central values by not mentioning the contents of values. Overall, I find that as long as values are materials for constructing people's self-concept, they serve to structure the self and enhance its coherence and stability. Across different values, accessibility of central values-concept has meaningful psychological consequence such as predicting one's general tendency to explore exploration as well as engaging in risk-taking behaviors.

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My research opens new exploration for understanding the social functions of values by explicitly linking values to people's self-concept. In doing so, I suggest that the accessibility of central values is a meaningful dimension for studying how beliefs affect people's motivation, social relationships and behavior.

Practical Implications

This line of work, if further supported by robust empirical evidence that comes from more research in the future, could carry important implications for social policies. People's self-concept is profoundly linked to their life experience and well-being. Most current programs that aim to promote better mental health have focused on either increasing structure/stability of the self-concept (Bigler, Neimeyer, & Brown, 2001; Lee-Flynn, Pomaki, DeLongis, Biesanz, & Puterman, 2011) or promoting its malleability (Cheng, Kogan, & Chio, 2012; Creswell, 2017). Nonetheless, if a balanced self-concept can preserve both stability and dynamism, it holds the promise to fostering sustained well-being over time.

Limitation and Future Directions

I acknowledge several important limitations of this work. Although centrality of values to the self consistently shows a positive association with a general interest in exploration, causal evidence is still lacking. I have yet to find a main effect of accessibility of central values on people's interest in exploration. The significant indirect effects were not really perfect mediation analyses since the manipulated variable and measured variables were correlational. It could be that unknown suppressor variables reduced the chance of detecting a main effect. For instance, most values that I used in the empirical studies were positively valenced, and goal-directed. In that sense, having central values should motivate people to focus on socially desirable goals. As a result, could accessibility of central values make exploration seem a less responsible thing to do, and therefore suppresses the motivation

for exploration? More research is needed to detect the main effect or identify potential suppressors.

Moreover, people's motivation to balance their self-concept might only be activated if their self-concept is sufficiently constrained. It is unclear the extent to which accessibility of central values imposes constrains on the self to the detriment of its malleability. Future work could measure if people's prior levels of balance between stability and dynamism of the self-concept moderate the effect of the accessibility of central values on people's interest in exploration. Likewise, if a more balanced self-concept is conducive to overall subjective well-being, it is likely that those with a higher level of well-being are better at or more sensitive to balancing their self-concept. It would be worthwhile to test if people's subjective well-being also moderates the effect of accessibility of central values on people's interest in exploration.

Another important step to take is to better understand the psychological mechanism and rule out alternative explanations for the observed effect. The extant empirical evidence does not allow me to fully tease apart the self-balancing based mechanism from the one based on attachment security or self-esteem.[4]

The theory I propose here is broad in scope. Defining one's sense of self via values is one way to increase the stability of the self. Future research could examine the downstream consequences of defining one's self with other qualities such as one's social relationships, physical attributes and personal history and so on. Doing so would shed light on if constructing a sense of self based on beliefs is particularly conducive to increasing the stability of the self or defining the self based on any qualities would have similar effects.

The hypothesis I put forth suggests that people's motivation for balancing their self-

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[4] In another empirical study that is not included here, I did find empirical evidence the manipulation of accessibility of central values did not affect people's state level attachment security. Nonetheless, more evidence is needed to convincingly distinguish the balancing-related account from attachment theory.

concept is prevalent. Future research is needed to test the scope and level of people's motivation for balancing their self-concept. Researchers are encouraged to use different research methods such as experience sampling, text analyses or computational methods to capture motivation related to self-concept balancing in naturalistic settings. Using multiple methods could help to find self-balancing related motivation that people consciously or unconsciously exhibit.

More broadly speaking, it would a fruitful line of work to examine different ways people experience stability and dynamism in their self-concept and find different measures to capture people's efforts to balance the dual features of their self-concept. In addition to a general interest in exploration, what other means do people employ to balance their self-concept? While the current work focuses on people seeking exploration as a means to balance having too much structure in their self-concept, future work could also examine instances when people seek structure to balance having heightened dynamism in their self-concept.

Another future direction is to investigate the downstream consequences of central values. One assumption that I make is that having a stable self while preserving its dynamism is most adaptive. If that is the case, we might expect that people with a more balanced self-concept to have better well-being in life. Future research could explicitly examine this hypothesis. Furthermore, one could examine other social consequences of having a balanced self-concept. For example, do people with a balanced self-concept gain social status or rise to power? Is a balanced self-concept considered a leadership quality? There are many interesting questions that future researchers could pursue.

I also encourage future researchers to examine cultural variations in people's motivation to balance their self-concept. It is plausible that certain cultures emphasize the stability of self-concept whereas others prize the development of a malleable self. Moreover, certain cultures might explicitly link a balanced self-concept to life satisfaction or happiness.

It would be a fruitful area of inquiry to explore cultural conceptions of a balanced self-concept.

Conclusion

Existing theories such as Self-Affirmation Theory and Adult Attachment Theory both suggested compelling accounts for understanding the link between accessibility of central values and exploration. In this dissertation, I develop a novel theoretical underpinning for this relationship between the two variables. This proposed theoretical account is broader in scope but also compatible with existing research findings. Specifically, I discuss constraints as a property of central values and suggest that accessibility of central values increases stability of the self. As a result, people are more interested in exploration, which introduces uncertainty into the self-concept. This process eventually restores dynamism in the self-concept. Through a set of five empirical studies, I find evidence that is consistent with the hypothesis using various values in different contexts. I also show that accessibility of central values predicts risk-taking behavior. Furthermore, central values are not an isolated, intrapersonal phenomenon, but are connected to one's social relationships. I find values that are shared by meaningful in-group members are more likely to be self-defining. Through this work, I hope to inspire more future research on the complex ways by which the dual features of the self-concept are maintained.

Research tradition/theories	Core propositions related to the structure aspect of the self-concept	Example papers
Personality psychology	A set of fundamental traits are defining of people's sense of self. Such traits are universal and show cross-domain consistency across a long period of time.	Conley (1985); Eysenck (2017); McCrae & Costa Jr, (1994); McAdams, (1994)
Values	People hold a set of abstract ideas about what is important in life (i.e., values). Their values transcend specific situations and determine desirable end goals and guide action and decision across domains.	Schwartz (2012); Schwartz et al., (2012); Schwartz & Boehnke (2004)
Moral character	People have innate traits that carry moral weight. These characters consistently predict their behaviors.	Cohen, Panter, Turan, Morse & Kim (2014); Goodwin, Piazza, & Rozin (2014)
Social Identity Theory	People define their self-concept in terms of their group membership. Social identity reduces uncertainty and fulfills a need for affiliation.	Ellemers & Haslam (2011); Hornsey (2008); Hogg & Abrams (1993); Hogg & Mullin (1999); Hogg (2000)
Self-concept clarity	Self-concept is multi-faceted. A well-defined self is internally consistent and temporarily stable.	Campbell (1990); Campbell et al. (1996).
Self-essentialism	People believe their sense of self is defined by an underlying essence such that their true self is immutable to change.	Christy, Schlegel, & Cimpian (2019); Dulaney, Graupmann & Quinn (2019)
Self-verification Theory	People prefer others to see them as they see themselves, even if their self-views are negative.	Swann Jr, Pelham, & Krull (1989); Swann Jr (2011); Swann Jr, Rentfrow, & Guinn (2003)
Worldview confirmation	People selectively attend to information that confirms their pre-existing viewpoints. They are also motivated to defend their worldviews when faced with disconfirming information.	Major, Kaiser, O'Brien, & McCoy (2007); Jonas, Schulz-Hardt, Frey, & Thelen (2001); Major et al. (2007); Nickerson (1998)

Table 1. A summary of research that focuses on the structure aspect of the self-concept

Research tradition/theories	Core propositions related to the malleable aspect of the self-concept	Example papers
Symbolic Interactionism	All self-knowledge comes from real or symbolic social interactions.	Baldwin (1897); Collins (2014); Cooley, (1902); Fazio et al., (1981); Mead (1934); Scheibe (1985); Stryker (1980); Scheff (1997)
Working self-concept/phenomenal self	A self-concept is constructed when situational cues activate one's pre-existing schemes.	Markus & Wurf (1987); Rhodewalt & Agustsdottir (1986); Schlenker (1985)
Possible selves	Possible selves are ideas about what people might become, what they would like to become, and what they are afraid of becoming.	Markus & Nurius (1986)
Goal-oriented activation of self-concept	People construct a sense of self to facilitate the pursuit of goals.	Campbell et al. (1996); Kunda, & Sanitioso (1989); Richman, Slotter, Gardner, & DeWall (2015)
Self-Expansion Theory	People expand their self-concepts by including close others' characteristics as part of their self-concept.	Aron & Aron (1997); Aron, Norman, & Aron (1998); Gardner, Gabriel, & Hochschild (2002)
Self-Affirmation Theory	People restore their esteem in the face of self-threatening information by attending to an unrelated positive aspect of the self	Sherman & Cohen (2006); Steele (1988)
Meaning Maintenance Model	People engage in fluid compensation when faced with self-threatening information to restore an overall sense of meaning in life.	Heine, Proulx & Vohs, (2006)
Self-complexity	Switching among different aspects of a complex self-system buffers against stress-related illness and depression.	Linville (1987)

Table 2. A summary of research that focuses on the malleable aspect of the self-concept

**Table 3.** Correlations among selected variables in Study 1a

	Central values	Self-certainty	Interest in exploration	Openness	Societal certainty	Need for structure	Need to belong	Individualism	SES
Central values									
Self-certainty	0.37**								
Interest in exploration	0.16*	0.17*							
Openness to experience	0.21**	0.30**	0.48**						
Societal certainty	-0.09	0.14*	-0.13+	-0.04					
Need for structure	0.30**	0.20**	-0.29**	-0.13+	-0.05				
Need to belong	0.01	-0.12+	0.04	-0.02	0	0.07			
Individualism	0.20**	0.17*	0.06	0.14*	-0.08	0.29**	-0.18**		
SES	0.1	0.13+	-0.07	0.02	0.13+	0.12+	0.16*	-0.05	
Political orientation	-0.04	0.1	-0.11	-0.08	0.27**	-0.06	-0.08	0	0.07

$+ p<.10$

$*p<.05$

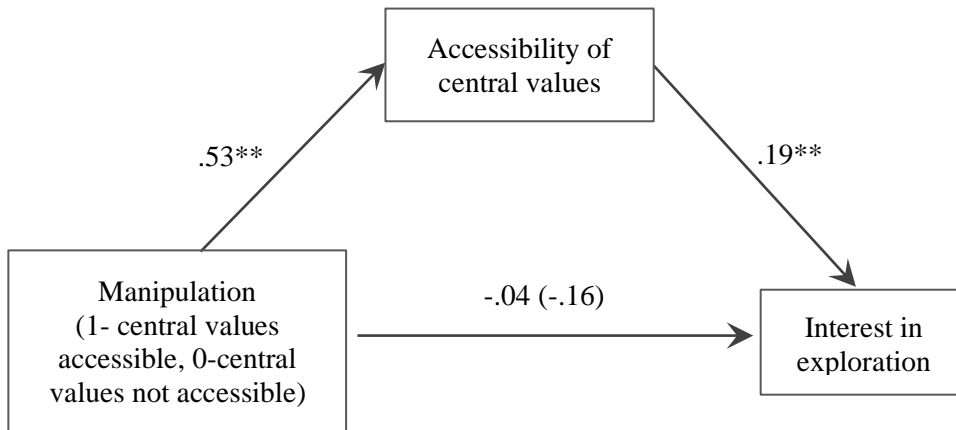$**p< .01$
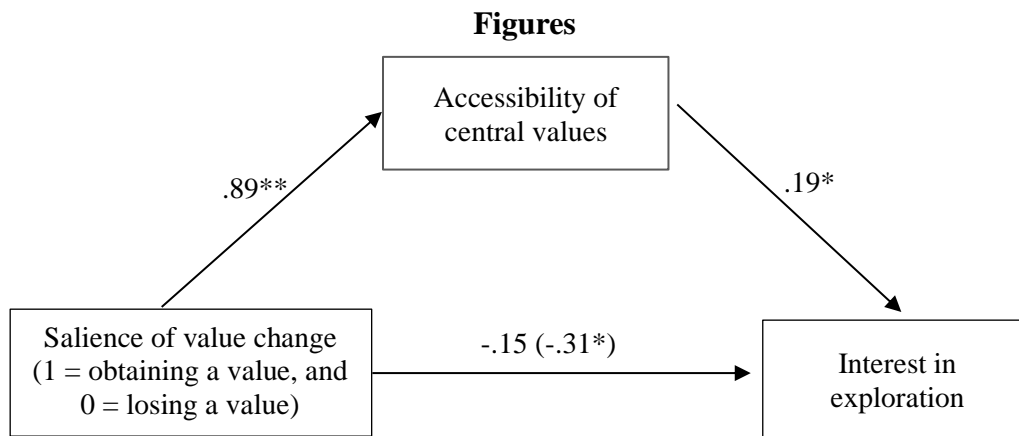
Figure 1. Standardized regression coefficients for the relationship between salience of value change and interest in exploration as mediated by accessibility of central values (Study 2). The standardized regression coefficient between salience of value change and interest in exploration, controlling for accessibility of central values, is noted in parentheses.

*p < .05 **p < .01

Figure 2. Standardized regression coefficients for the relationship between manipulation of accessibility of central values and interest in exploration as mediated by measured variable (Study 4). The standardized regression coefficient between the manipulation and interest in exploration, controlling for accessibility of central values, is noted in parentheses.
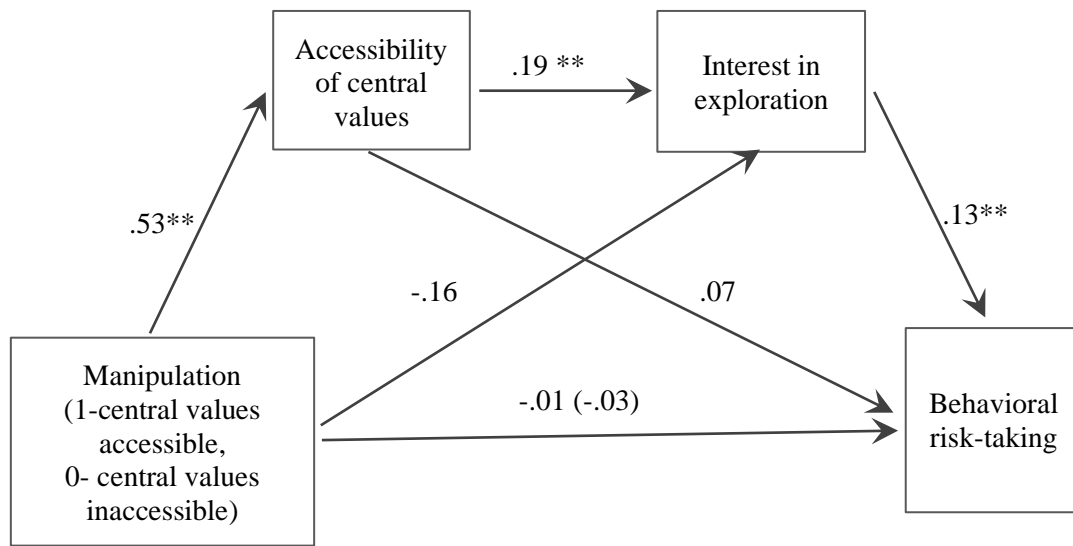
p < .05 **p* < .01

Figure 3. Standardized regression coefficients for the relationship between manipulation of

accessibility of central values and behavioral risk-taking as serially mediated by the measured

variable and interest in exploration (Study 3). The standardized regression coefficient

between the manipulation and behavioral risk-taking, controlling for accessibility of central

values and interest in exploration, is noted in parentheses.

*p < .05 **p < .01

Figure 4. Standardized regression coefficients for the relationship between sharedness of

one's value by fellow in-group members and interest in exploration as mediated by

accessibility of central values (Study 4). The standardized regression coefficient between

value-sharedness and interest in exploration, controlling for accessibility of central values, is
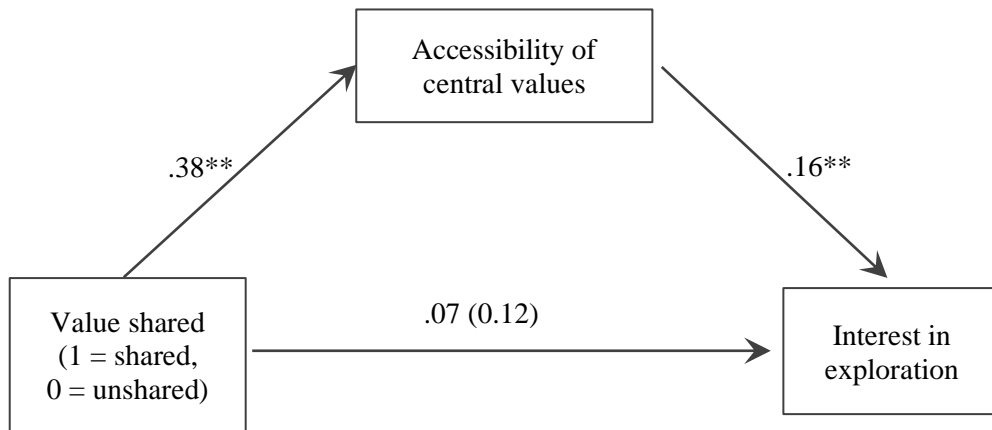
noted in parentheses.

*p < .05 **p < .01

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Supplemental Materials

A Review of Theories on the Stability and Dynamism of the Self-concept

Stability of the Self

A significant body of work on self-concept highlights people's desire to seek stability. The field of personality psychology has devoted considerable scholarly efforts to unpacking the fundamental characteristics that are considered defining of people's sense of self (Eysenck, 2017; McAdams, 1994). This research tradition has demonstrated that personality traits have remarkable cross-domain consistency over a long period of time (Conley, 1985; McCrae & Costa Jr, 1994). Likewise, recent research on moral characters proposes that people have innate traits that carry moral weight (Cohen, Panter, Turan, Morse & Kim, 2014; Goodwin, Piazza, & Rozin, 2014).

Social Identity Theory proposes that people define themselves in terms of their membership in a social group (Ellemers & Haslam, 2011; Hornsey, 2008). Underlying the construction of social identity is an affiliative motive and a general desire to mitigate uncertainty (Hogg & Abrams, 1993; Hogg & Mullin, 1999; Hogg 2000).

A stable self is one in which its multiple components are internally coherent and temporally stable (Campbell, 1990; Campbell et al., 1996). More recently, scholars have shown that people tend to *essentialize* their sense of self and believe that the self is underlaid by immutable qualities that clearly distinguish one person from another (Christy, Schlegel, & Cimpian, 2019; Dulaney, Graupmann & Quinn, 2019).

Furthermore, research on Self-verification Theory postulates that people gravitate towards a sense of coherence with respect to their own characteristics or qualities (Swann Jr, Pelham, & Krull, 1989; Swann Jr, 2011). This pursuit of consistency is so strong that people even prefer others to confirm negative views they hold about themselves (Swann Jr, Rentfrow, & Guinn, 2003). Similarly, research on worldview confirmation shows that high

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self-esteem results from information that validates existing views that people have (Major, Kaiser, O'Brien, & McCoy, 2007).

Overall, a structured sense of self is associated with favorable life outcomes (Ritchie, Sedikides, Wildschut, Arndt, & Gidron, 2011). Having a well-defined sense of self is conducive to having high-quality social relationships (Lewandowski Jr, Nardone, & Raines, 2010), and is crucial for forming positive self-evaluations (Campbell, 1990; Campbell et al., 1996). Furthermore, having an entity view on one's self-concept allows people to feel authentic (Christy et al., 2019), and ultimately fulfills people's need for structure (Landau et al. 2004; Cutright, 2011; Whitson & Galinsky, 2008; Landau, Kay, & Whitson, 2015). For these reasons, having a self-defined self generally predicts positive life outcomes such as having meaning in life and life satisfaction (Dulaney et al., 2019). Having a structured sense of self also effectively helps people to cope with stressful events in life and recovers from traumatic experiences (Larson & Sbarra, 2015).

Dynamism of the Self

By contrast, another line of work has taken a different approach to exploring the nature of the self. The Symbolic Interactionism tradition suggests that all self-knowledge comes from real or symbolic social interactions (Baldwin, 1897; Cooley, 1902; Fazio et al., 1981; Mead 1934; for a historical review, see Scheibe 1985; for a review of symbolic interactionism, see Stryker 1980; Scheff, 1997; Collins, 2014). A self-concept is constructed when situational cues activate one's pre-existing schemes. For instance, hearing a friend talk about a recycling bin might activate one's self-concept as an environmentalist. Alternatively, a self-concept can be constructed on the spot based on feedback from other people. As an example, a person might tentatively form a self-concept as a modern dancer when trying modern dance for the first time and is warmly complimented by their instructor. The way that

the self-concept is constructed depends on a combination of salient features of the self and novel information from the social environment (Markus & Wurf, 1987).

Not all aspects of the self-concept is accessible at any one time. Contextual cues and one's motivational states render particular components of the self-knowledge more active than other components (Rhodewalt & Agustsdottir, 1986; Schlenker, 1985). For example, the self-concept is influenced by the characteristics of other people who are present (Stout, Dasgupta, Hunsinger, & McManus, 2011), and is synchronized to become similar to salient social category of other people (Kawakami et al., 2012). People's self-concept is also sensitive to information about their own uniqueness or commonality with others (Brewer 2003; Markus & Kunda, 1986). People even highlight or downplay a particular attribute of themselves depending on the desirability of that attribute for achieving important goals (Campbell et al., 1996; Kunda, & Sanitioso, 1989). Notably, people's self-definitions are considerably altered by their mood in daily life (Showers, Abramson, & Hogan, 1998).

The malleability of the self is the basis for people to adapt to changes in the social environment. When socially excluded, people modify their self-concepts to increase similarity to potential friends in an effort to regain affiliation (Richman, Slotter, Gardner, & DeWall, 2015). Self-Expansion Theory argues that people expand their self-concepts by including others' characteristics as part of their self-concept to maintain closeness (Aron & Aron, 1997; Aron, Norman, & Aron, 1998; Gardner, Gabriel, & Hochschild, 2002). Furthermore, people restore their esteem in the face of self-threatening information by attending to an unrelated positive aspect of the self in a different domain (Cohen & Sherman, 2014; Steele, 1988). Oftentimes, such compensation could be quite fluid to ensure the coherence of one's self-system (Heine, Proulx & Vohs, 2006). Moreover, switching among different aspects of a complex self-system buffers against stress-related illness and depression

(Linville, 1987). Overall, people would not be adaptive if the self was not dynamic or capable of change.

Study 1a

Measures of exploratory variables

      Perceived social support. A shortened four-item measure was included (Zimet, Dahlem, Zimet, & Farley, 1988): "There is a special person who is around when I am in need", "My family really tries to help me", "I can count on my friends when things go wrong", and "I can share my sorrows and joys with people around me". Participants answered these questions on a 7-pt. scale (1 = *strongly disagree*, and 7 = *strongly agree*). Together these items formed a reliable composite (α = .79).

      Horizontal individualism. Participants indicated their self-concept orientation with the following four items (Triandis & Gelfand, 1998): "I'd rather depend on myself than others", "I rely on myself most of the time; I rarely rely on others", "I often do my own thing", and "My personal identity, independent of others, is very important to me". Participants answered these questions on a 7-pt. scale (1 = *strongly disagree*, and 7 = *strongly agree*). Together these items formed a reliable composite (α = .72).

Additional discussion

      Note that the personal need for structure is conceptually the opposite of interest in having exploration, and indeed, we observed a negative correlation between the two variables. It is thus worthwhile to differentiate between *needing* structure and *having* structure. Accessibility of central values can be said to represent having structure, and was conceptually different from need for structure. Curiously, the two variables were positively correlated. It was plausible that people who tended to gravitate towards regularity in life may "store" more structure inside their sense of self-concept in the form of beliefs. Nonetheless, it was intriguing that the two variables had divergent effect on having exploration.

Study 1b

Definitions of the two beliefs

In this section, we are interested in understanding your beliefs about the relative importance for business to **maximize revenue vs. solve social problems**.

Maximizing revenue

Business should maximize financial gains.

Solving social problems

Business should play an active and direct role in solving social problems.

Study 3

Online bot check

In addition to the Qualtrics CAPTCHA question, participants were instructed to not write any text in a text box.

English comprehension question

The exact texts are shown below. The order of the choices for the question was randomized, and the correct answer was "To help consumers make informed decisions".

Before we continue to the main portion of the survey, we would like to ensure your ability to continue using a basic reading comprehension question.

Reading Task 1

Please read a brief summary of a research finding.

Brewers' Voluntary Disclosure Initiative Launched

The Beer Institute has recently launched The Brewers' Voluntary Disclosure

Initiative. This initiative, to be completed in 2020, encourages major brewers in America to voluntarily place serving facts labels and freshness dating on bottles and cans of beer. This initiative is intended to help consumers make more informed decisions about the beverages they choose. Six major beer companies have already agreed to follow the new guidelines.

What does the Brewers' Voluntary Disclosure Initiative intend to achieve?

- To help consumers make informed decisions

- To expand the international market of the American beer industry

- To reduce prices of major brands of beer

- To increase the overall consumption of beers

- To encourage consumers to choose beer produced by smaller brewers

Behavioral measures of risk-taking

Less risky option
10% chance of getting $.40, 90% chance of getting $.32
20% chance of getting $.40, 80% chance of getting $.32
30% chance of getting $.40, 70% chance of getting $.32
40% chance of getting $.40, 60% chance of getting $.32
50% chance of getting $.40, 50% chance of getting $.32
60% chance of getting $.40, 40% chance of getting $.32
70% chance of getting $.40, 30% chance of getting $.32
80% chance of getting $.40, 20% chance of getting $.32

90% chance of getting $.40, 10% chance of getting $.32
100% chance of getting $.40, 0% chance of getting $.32

More risky option
10% chance of getting $.77, 90% chance of getting $.02
20% chance of getting $.77, 80% chance of getting $.02
30% chance of getting $.77, 70% chance of getting $.02
40% chance of getting $.77, 60% chance of getting $.02
50% chance of getting $.77, 50% chance of getting $.02
60% chance of getting $.77, 40% chance of getting $.02
70% chance of getting $.77, 30% chance of getting $.02
80% chance of getting $.77, 20% chance of getting $.02
90% chance of getting $.77, 10% chance of getting $.02
100% chance of getting $.77, 0% chance of getting $.02

Debrief materials

Thank you for your participation in this study. Your involvement is very important to us, without it, we are unable to conduct social science research. We appreciate your contribution and would like to tell you more about this study.

We are interested in understanding how people define themselves in terms of their

beliefs. Specifically, we are interested in whether having beliefs that are central to one's self-concept may lead people to be more interested in exploration. To test our hypotheses, we asked participants to read summary of a report that was explicit in the accessibility of central values. The passage that participants read were NOT real, nor an accurate portrayal of real data in the world in any way, but were drafted by us as examples of expressions of accessibility of central values vs. lack of accessibility of central values.

In the process of analyzing the data, please note that we do not look at any individual's behavior or answer, but rather, we are interested in patterns of how people in general behave. Please remember that we have stored all the records completely confidentially and that no one will have access to your data except the research team, and that your contact information will be destroyed. Importantly, now that you know more about our intentions behind this research, if you feel that you would not like us to include your data in our completely anonymous analyses, you have the right to tell us to exclude your data with no adverse consequences for you. Please inform us immediately and we will permanently delete all of your records.

We hope that at this point, you have a general idea of the study. We thank you for participating today. If you have any questions, feel free to contact [name omitted for anonymous review].

Study 4

Additional Measures

Relational closeness. I constructed an one-item picture measure of relational closeness. Participants saw a series of five pictures with varied distance between a single person and a group and were asked to choose the one picture that best described their feelings about their relationships with other X University alumni from their cohort. See supplementary materials for the pictures used in this measure.

Perceived malleability of values. A four-item measure was constructed: "My values are changeable", "My beliefs about what is important in life tend to be stable (r)", "My values are constantly changing", and "My values are not fixed (r)". Participants answered these questions on a 7-pt. scale (1 = *strongly disagree*, and 7 = *strongly agree*). These items formed a reliable measure ($\alpha = .76$).

Value-behavior consistency. I constructed a four-item measure to capture the extent to which participants saw their values as predictive of their behaviors. The items were: "My values predict my behaviors", "I tend to behave in a way that is consistent with my values", "My values do not affect my actions (r)", and "What I do is determined by my value". Participants answered these questions on a 7-pt. scale (1= *strongly disagree*, and 7 = *strongly agree*). These items formed a reliable measure ($\alpha = .75$).

Group identification. A five-dimensional measure was used (Leach et al., 2008). The three items for the solidarity dimension were: "I feel a bond with other X (University) alumni from my cohort", "I feel solidarity with other X (University) alumni from my cohort", "I feel committed to other X (University) alumni from my cohort". The four items for the satisfaction dimension were: "I am glad to be part of the X (University) alumni from my cohort", "I think that X (University) alumni from my cohort have a lot to be proud of", "It is pleasant to be one of the X (University) alumni from my cohort", "Being a member of the X (University) alumni of my cohort gives me a good feeling".

The group centrality dimension included three items: "I often think about the fact that I am one of the X (University) alumni from my cohort", "The fact that I am part of the X (University) alumni from my cohort is an important part of my identity", "Being a member of the X (University) alumni of my cohort is an important part of how I see myself". The two items for self-stereotype dimension were: "I have a lot in common with the average X (University) alumni from my cohort", "I am similar to the average X (University) alumni

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from my cohort". The dimension of group homogeneity had two items: "The X (University) alumni from my cohort have a lot in common with each other", "The average X (University) alumni from my cohort is very similar to each other". Participants answered these questions on a 7-pt. scale (1 = *strongly disagree*, and 7 = *strongly agree*). All the items together formed a reliable measure of group identification (α = .92).

Horizontal collectivism. Four items from (Triandis & Gelfand, 1998) were used: "If a coworker gets a prize, I would feel proud", "The well-being of my coworkers is important to me", "To me, pleasure is spending time with others", "I feel good when I cooperate with others". Participants answered these questions on a 7-pt. scale (1 = *strongly disagree*, and 7 = *strongly agree*). The reliability of this measure was slightly below the acceptable level (α = .67).

Need for uniqueness. The four items from Lynn & Harris (1997) were used: "I prefer being____different from other people." "Being distinctive is____important to me." "I____intentionally do things to make myself different from those around me." "I have a____need for uniqueness." Participants responded to the questions on a 5-pt. scale with different descriptors used for each question. All the items together formed a reliable measure (α = .82).

Filler task. Participants rated how artistically valuable they thought each of the five paintings were.

Definitions of equality and equity

Participants were presented with the following definitions as well as accompanied pictures. The order with which the two values were presented was counterbalanced to eliminate any anchoring effect.

Equality

Equality means that society should treat everyone the same and give them the same resources to succeed in life.

Equity

Equity means that society should acknowledge everyone's differences and give them what they need to succeed in life.

Measure of relational closeness

Additional analyses of exploratory variables

First of all, the value sharedness manipulation didn't change people's identification with their in-group, $t(219) = -.23$, $p = .82$. In addition, people who learned that their values were shared by their fellow alumni cohort were less surprised by the finding than those who learned the opposite, $t(219) = -6.50$, $p < .001$.

Consistently with the theorization, this suggested that people's group identification remained constant and wasn't easily altered. Because of their high group identification, they expected that their values to be shared by their fellow alumni cohorts.