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Leveraging The First Comprehensive Measure Of Primal World Beliefs To Further Discussions In Political, Developmental, And Positive Psychology

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Abstract

If behavior is influenced by the perceived character of situations, many disciplines that study behavior may eventually need to take into account individual differences in the perceived character of the world. In the first effort to empirically map these perceptions, subjects varied on 26 dimensions, called primal world beliefs or primals, such as the belief that the world is abundant. This dissertation leverages the first comprehensive measure of primals to further discussions in political, developmental, clinical, and positive psychology. Chapter I challenges the consensus that political conservativism is distinguished by the belief that the world is dangerous. Results suggest previous research relied on a measure highlighting dangers conservatives fear and neglecting dangers liberals fear, when both perceive the world as almost equally dangerous (8 samples; total N=3,734). A novel account of political ideology is proposed based on more predictive primals. Chapter II discusses how primals might develop. The author distinguishes retrospective theories—where primals reflect the content of past experiences—from interpretive theories—where primals act as lenses for interpreting experiences while remaining uninfluenced by them—and suggests twelve ways each theory's relative merit can be empirically tested. A novel comprehensive framework for considering experiences in relation to any new construct is also proposed. Chapter III explores primals' wellbeing-related correlates. By showing that many parents aim to teach negative primals to their children, some prevalence for meta-beliefs (i.e., beliefs about beliefs) associating negative primals with positive outcomes is established. Study 2 tests these meta-beliefs in six samples (total N=4,535) in regards to eight outcomes: job success, job satisfaction, emotion, depression, suicide, physical health, life satisfaction, and flourishing. Results indicate that negative primals are almost always associated with modestly to dramatically worse outcomes, across and within professions. In addition to filling a literature gap, and establishing bases for future comparison studies, findings could be used to strengthen interventions by undermining counterproductive meta-beliefs. Findings also underscore the urgent need for further research on the impact of primal world beliefs—teaching children or anyone that the world is a bad place in order to protect or prepare them may be ill-advised.

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LEVERAGING THE FIRST COMPREHENSIVE MEASURE OF PRIMAL WORLD BELIEFS TO FURTHER DISCUSSIONS IN POLITICAL, DEVELOPMENTAL, AND POSITIVE PSYCHOLOGY

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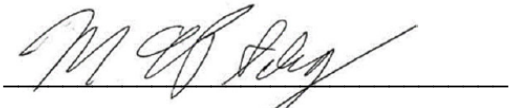

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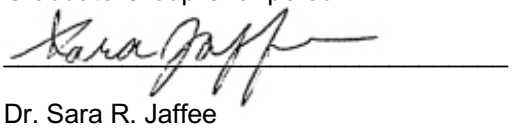

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LEVERAGING THE FIRST COMPREHENSIVE MEASURE OF PRIMAL WORLD BELIEFS TO FURTHER DISCUSSIONS IN POLITICAL, DEVELOPMENTAL, AND POSITIVE PSYCHOLOGY

Dedicated to

Tilia J. F. Clifton

b. 2019

Thank you for joining us.

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Civilization rests on a necessary yet absurd all-or-nothing approach to credit. While I will (hopefully) soon receive a doctorate from a top institution, many from my past deserve direct credit for this accomplishment. From my mother, to childhood friend Eric Whitaker, to 11th grade American History teacher Mr. Chandler, to Director of the MAPP program James Pawelski, to world-renown belief researcher Carol Dweck, hundreds have contributed in important ways to the process that led me here. Thank you.

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When Martin Seligman took a chance on me, I did not fully realize the extent which we are both philosophy/history dilletantes and idea junkies fascinated by the possibility that we might be wrong about everything—a fine pairing. A favorite memory from grad school is the moment we simultaneously realized we had both recently read the same obscure history of the Mongolian empire. He is one of the few researchers I know who consistently recognizes the value of ideas without requiring confirmation from others, seeing the value of primals when they were still "universal assessments" (and played a key role renaming them), the Cube Framework when I created it years ago for my own use, the politics chapter herein, and my qualifying exam on validity versus reliability trade-offs. My favorite piece of advice I will take away from grad school is *less is more*. I continue to learn from him and suspect I always will.

Angela Duckworth keeps rescuing me from difficulties and promoting my work in ways I find truly humbling. I am especially grateful for her help in figuring out what I want to do with my life and for offering me a job when my own prospects became unclear so I could focus on research. My proudest moment in grad school was when, after reading my qualifying exam, she

started my defense saying, “So, this totally convinced me that primals are worth looking into. Can I shake your hand?”

Having been in the PhD trenches with me for years, David Yaden inspires me to challenge myself, mainly by being himself a glutton for punishment. Thank you for sharing an office with me for six years, and for being such a wonderful discussion partner and for all your excellent advice. Josh Baker reminded me to believe in my ideas and is a source of constant encouragement. I am so grateful to emerge from graduate school with such dear friends.

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ABSTRACT

LEVERAGING THE FIRST COMPREHENSIVE MEASURE OF PRIMAL WORLD BELIEFS TO FURTHER DISCUSSIONS IN POLITICAL, DEVELOPMENTAL, AND POSITIVE PSYCHOLOGY

Jeremy D. W. Clifton

Martin E. P. Seligman

If behavior is influenced by the perceived character of situations, many disciplines that study behavior may eventually need to take into account individual differences in the perceived character of the world. In the first effort to empirically map these perceptions, subjects varied on 26 dimensions, called *primal world beliefs* or *primals*, such as the belief that the world is abundant. This dissertation leverages the first comprehensive measure of primals to further discussions in political, developmental, clinical, and positive psychology. Chapter I challenges the consensus that political conservativism is distinguished by the belief that the world is dangerous. Results suggest previous research relied on a measure highlighting dangers conservatives fear and neglecting dangers liberals fear, when both perceive the world as almost equally dangerous (8 samples; total *N*=3,734). A novel account of political ideology is proposed based on more predictive primals. Chapter II discusses how primals might develop. The author distinguishes *retrospective* theories—where primals reflect the content of past experiences—from *interpretive* theories—where primals act as lenses for interpreting experiences while remaining uninfluenced by them—and suggests twelve ways each theory's relative merit can be empirically tested. A novel comprehensive framework for considering experiences in relation to any new construct is also proposed. Chapter III explores primals' wellbeing-related correlates. By showing that many parents aim to teach negative primals to their children, some prevalence for meta-beliefs (i.e., beliefs about beliefs) associating negative primals with positive outcomes is established. Study 2 tests these meta-beliefs in six samples (total *N*=4,535) in regards to eight outcomes: job success, job satisfaction, emotion, depression, suicide, physical health, life satisfaction, and flourishing. Results indicate that negative primals are almost always associated with modestly to dramatically

worse outcomes, across and within professions. In addition to filling a literature gap, and establishing bases for future comparison studies, findings could be used to strengthen interventions by undermining counterproductive meta-beliefs. Findings also underscore the urgent need for further research on the impact of primal world beliefs—teaching children or anyone that the world is a bad place in order to protect or prepare them may be ill-advised.

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PREFACE

Growing up, I hated science. It seemed like nothing but dull worksheets with pre-determined answers. Only in grad school did I first experience its thrill, which is discovery. I may never get to sail un-sailed seas, but I can dig through data with statistical tools to unearth answers to fascinating questions nobody has answered before, and not just answers that other people care about, but ones that I care about, deeply. Six years ago, for example, I had no idea that the most basic beliefs individuals hold about reality fall along three dimensions of *Safe*, *Enticing*, and *Alive*; I had no idea these beliefs were so stable; and I had no idea political conservatives don't actually see the world as especially dangerous (low *Safe* scores). Also, who would have thought that finding one's own intuitions to be demonstrably false was so much fun? I think it says something positive about the state of humanity that so many of us have dedicated ourselves to indulging in discovery—luckily a pro-social addiction—and society has chosen to support our lifestyle.

While I hope this dissertation qualifies my acceptance into the community of discovery addicts, this community may by its nature find this dissertation a tad unsatisfying. I spent most of my graduate career learning the skills of psychometric validation and developing the Primals Inventory. The plan of a measurement-focused dissertation changed when I realized that, simply by being the most comprehensive measure of its kind, the Primals Inventory could be leveraged to quickly address some obviously important ongoing empirical discussions about relevant beliefs. Yet low-hanging empirical fruit is not necessarily the most delicious. Given primal world beliefs' broad theoretical implications, the most delicious question is, can causation be established experimentally? While much in this dissertation seeks to inform how experimentation might be pursued, readers may feel like I'm sidestepping the big question to ask smaller ones—because I am. Nevertheless, I invite readers to enjoy these discoveries anyway, if only as mere prologue to more important discoveries in the future. I suppose the same might be said of all empirical science.

Each of these three chapters represent more or less stand-alone research articles. Pre-registered hypotheses in this dissertation can be found on the Open Science Framework (https://osf.io/gw79e/?view_only=de0b61485c4748979414e51df0af5b5d). For readers unfamiliar with primals, useful nonessential background reading is Clifton and colleagues (2019) paper introducing primal world beliefs. A less time consuming option is glancing at Figure 1 in the appendix, which introduces the reader to all 26 primals, the main characters of this three-chapter story. Chapter 1 examines how primals might influence politics, pushing back against the accepted idea that conservatives see the world as dangerous. Chapter 2 discusses where primals might come from, focusing on the relevance (irrelevance rather) of experiences. Chapter 3 explores which primals might contribute to wellbeing and success; it turns out that many parents aim to teach their children that the world is in various ways a bad place, which may not be the best idea. Overall, this dissertation aims to contribute to important ongoing discussions in political, developmental, clinical, and positive psychology while demonstrating the value of the primals framework along the way.

CHAPTER 1 - THE PRIMAL WORLD BELIEFS OF POLITICAL IDEOLOGY

Abstract

Cooperation requires agreement and compromise, which can be frustrated by deeper, unrecognized disagreements. Humans disagree on at least 26 primal world beliefs ("primals") which are extremely basic beliefs about the world's typical character. One primal, the belief that the world is dangerous, correlates with and is widely thought to contribute to political conservativism. However, this literature has relied on a measure which overemphasizes dangers conservatives fear and underemphasizes dangers liberals fear (replicated here, *N*=611). After administering a nuanced measure to eight samples (total *N*=3,734), the belief the world is dangerous shared surprisingly little variance with political ideology (<1%), placing it among those primals least correlated with political ideology. Six primals explained considerably more variance: *Hierarchical* (15%), *Intentional* (11.5%), *Acceptable* (9.2%), *Worth Exploring* (6.9%), *Just* (5%), and *Progressing* (2.6%). Together, their prominence suggests an alternative account in which conservatives see an inherently hierarchical, fair, cosmically sanctioned order to the universe that is being eroded, suggesting wisdom in constraining change and tolerating inequality; while liberals see an inherently nonhierarchical, unfair world that is improving, suggesting wisdom in accelerating change and resisting inequality. This account has implications for contemporary political messaging, historical analysis, and the future of human cooperation.

Introduction

The Proposition in Question

Humans possess a remarkable capacity to cooperate in large groups. Many cooperative efforts fail, however, due to a common fault-line separating those who typically favor change ("liberals") and those who typically oppose it ("conservatives"). Psychologists have sought to explain how this fault-line arises and perpetuates itself, proposing various contributing factors, such as values, demographics, Big Five traits, prejudices, cognitive ability, and genetics (Carney et al., 2008; Crawford et al., 2017; Haidt & Joseph, 2007; Pratto et al., 1997; Smith et al., 2011; Stankov, 2009). Laham and Corless (2016) observe that a family of proposed factors indicate conservatism is associated with fear. This family includes terror management theory, death anxiety, threat sensitivity, disgust emotions, fear of uncertainty, identity threat, and—the current interest—belief in a dangerous world (e.g., Hibbing et al., 2014; Inbar et al., 2009; Jost et al., 2003; Weise et al., 2008; Weissflog et al., 2013).

A great deal of research supports or evokes the following proposition: that a general belief that the world is a dangerous place (a) distinguishes political conservatism in cross-sectional research and probably (b) drives conservatism or related constructs such as authoritarianism, attitudes about guns, and so forth (Allport, 1954; Altemeyer, 1981, 1988, 1996; Choma & Hanoch, 2017; Conway et al., 2020; Cook et al., 2018; Crowson, 2009; Dallago et al., 2012; DeLuca et al., 2018; Duckitt, 2001; Duckitt et al., 2002; Duckitt & Fisher, 2003; Duckitt & Sibley, 2009; Federico et al., 2009; Hibbing et al., 2014; Janoff-Bulman, 2009; Jost, 2006; Jost et al., 2003; Lavine et al., 1999; Leone et al., 2019; Mcfarland, 2005; Oosterhoff, 2015; Park & Isherwood, 2011; Peterson et al., 1993; Scherer et al., 2015; Shook et al., 2017; Stroebe et al., 2017; Van Hiel et al., 2007; van Leeuwen & Park, 2009; Weber & Federico, 2007; White et al., 2020). This proposition makes intuitive sense (though perhaps less so among conservatives, e.g., Gilson, 2018). Many conservative views seem readily explained by fear, including keeping guns for protection, keeping criminals locked away, keeping immigrants out, keeping the military strong, keeping police unencumbered, and keeping the existing order strong. The intuition is also

popular among the general public, popping up in news media (e.g., Ball's, 2016, *Atlantic* article *Donald Trump and the Politics of Fear*) and social media, such as in this anonymized 2019 tweet:

> Conservatives are driven by fear. It rules their lives. Listen to language they use about immigrants, POC [people of color], new ideas, or any religion that isn't theirs (itself a system of fear control). They need guns for "protection" and crave authoritarians, even wannabes like Trump.

This tweet describes a centuries-old connection between fear and authoritarianism first articulated by the English philosopher, Thomas Hobbes, and it continues to animate research on right-wing authoritarianism, social dominance orientation, and other political constructs. Hobbes (1651) argued that however cruel a *leviathan* a King might become, citizens must submit to the monarch to stop societal descent into a worse *state of nature* (i.e., anarchy) where life is *nasty, brutish, and short*—perhaps the most famous line in political philosophy. Duckitt's (Duckitt et al., 2002) well-known dual process model formalizes this connection saying, "high RWA [right-wing authoritarianism] expresses the motivational goal of social control and security, activated by a view of the world as dangerous and threatening." One should submit to authority, in other words, because the world is a dangerous place.

Driving the proposition coupling dangerous world belief and political conservatism is also large and accumulating empirical literature, including many complementary experimental and observational studies in the broader family of fear-related constructs (e.g., Cook et al., 2018; Jost et al., 2004; Landau et al., 2004; Willer, 2004). For example, Cohen and colleagues (2005) found that mortality reminders increased support for conservative politician George W. Bush. Oxley and colleagues (2008) famously tied conservatism to physiology, including skin conductivity (though this recently failed to replicate; Bakker et al., 2020).

More pertinent to the proposition in question, however, is research measuring belief in a dangerous world directly. Sharing Hobbes' intuition, Altemeyer (1988) developed a belief in a dangerous world scale to examine the roots of political ideology, particularly right-wing authoritarianism. After examining how permutations of Altemeyer's items performed in 46

samples in the USA, New Zealand, Canada, Germany, Italy, Belgium, and South Africa (*N* = 12,939), Perry, Sibley, and Duckitt (2013) offered an improved 10-item Belief in a Dangerous World (BDW) scale. Nearly all political psychology research examining belief in a dangerous world operationalizes this primal using a variant of this scale. This literature repeatedly shows that BDW scale scores correlate positively with increased conservatism and conservative tendencies (Shook et al., 2017; Stroebe et al., 2017; many others cited above). Correspondence with BDW scale scores has even become a criterion for validating conservativism measures (Choma & Hanoch, 2017; Crowson, 2009; White et al., 2020). While Duckitt and others (e.g., Federico, Hunt, and Ergun 2009) often interpret the BDW scale as a measure of the social world and theorize on that narrower basis, many do not. Leeuwen and Park (2009, p. 169) aptly summarize the cross-sectional research saying, "If you are someone especially concerned about dangers, you are probably politically more conservative." On this foundation, researchers have theorized about the roots of political ideology.

This investigation reports data suggesting conservatives and liberals see the world as more or less equally dangerous; researchers were misled because the BDW scale highlights dangers conservatives fear while neglecting dangers liberals fear; and other world beliefs offer a more promising foundation to theorize about political ideology. These suggestions require contextualizing dangerous world belief as a member of a larger category of world beliefs.

A Larger Category of World Beliefs

The most studied world belief to date is belief in a just world (often called *BJW)*. Belief in a just world is the idea that the world is a karmic place where individuals get what they deserve and deserve what they get. It too was birthed out of a desire to explain a particular dependent variable, in this case blame and racism (Lerner, 1965, 1980; Montada & Lerner, 1998; Nesbit et al., 2012). However, whereas belief in a dangerous world remains mainly a creature of political research, belief in a just world was eventually connected to dozens of personality and wellbeing variables (Bartholomaeus & Strelan, 2019; Clifton et al., 2019). To summarize, those high in belief in a just world are (a) more hard-working and kind (presumably because the world rewards

hard work and kindness); (b) enjoy more success and wellbeing (presumably because they worked harder and were nicer); and (c) blame victims such as the poor and the sick (presumably because the unfortunate deserved it).

Other world beliefs may engender this sort of cascading influence across personality and wellbeing variables, which should occur for precisely the same reason why world beliefs have been historically overlooked in the literature: *the world* is a uniquely encompassing place, such that researchers have been slow to conceptualize "the world" as a place at all. As previously argued (e.g., Clifton & Kim, 2020), understanding the behavior of any given creature requires that scientists observe the creature's behavior in multiple environments. Scientists who observe a creature in one environment only, such as a chimpanzee in a room, are handicapped observers, unable to distinguish context-specific behaviors (i.e., state-like reactions to particular environments, or at least the creature's beliefs/perceptions of that environment) from organism-specific behaviors (i.e., trait-like expression of that creature's peculiar temperament). But what if a creature has beliefs about the character of an environment that, for whatever reason, the creature never leaves? If so, such beliefs would theoretically drive patterns of action that would manifest as organism-specific traits while actually being driven by context-specific reactions to underlying perceptions. Furthermore, if said environment became populated by other creatures who also never left, but viewed the character of said environment differently, all such creatures would occupy the position of said handicapped observer, being unable to distinguish context-specific from organism-specific behaviors. Moreover, if creatures were ignorant of their disagreement about the place they cohabit—which is probable if beliefs are multiple and implicit—all such creatures would likely misattribute numerous individual differences to differences in traits, thereby committing the fundamental attribution error on a massive scale.

If this situation applies to humans, substantial variance in most major human behaviors and outcomes that psychologists study—neuroticism, agreeableness, optimism, curiosity, extraversion, gratitude, depression, subjective wellbeing, life satisfaction, meaning in life, attachment style, trust, and political attitudes, to name but a few—could be powerfully shaped by

the cascading effects of beliefs about the most psychologically salient characteristics of the one place humans never leave. Yet few world beliefs have been studied. Because no effort has been made to empirically derive all major world beliefs and how they differentiate themselves statistically, previously identified world beliefs may overlap or be inaccurately labeled, and world beliefs that remain unidentified may be underlying causes of much-studied outcome variables, including political ideology.

To address this gap, Clifton and colleagues (2019) conducted the first systematic effort to empirically map all major beliefs about the basic character of the world as a whole. They labeled the latent phenomena *primal world beliefs* or *primals* to distinguish simple, adjectival, goal-relevant beliefs (e.g., *the world is a dangerous place*) from metaphysical, incidental, or historical world beliefs (e.g., *the world is composed of 118 chemical elements*). The effort was pursued with no particular dependent variable in mind or strong priors regarding dimensionality. It began with ten exploratory projects to identify candidate world beliefs. For example, they analyzed over 80,000 tweets beginning with phrases like “the world is”; the 840 most-frequently-used adjectives derived from 190,000 texts (450 million words); data from 12 focus groups representing Americans, Chinese, and all major world religions; and over 1,700 instances of world description gleaned from 385 of history’s most influential sacred texts, philosophical treatises, novels, political speeches, and films. This led to the identification of 234 items representing candidate primals that were then subjected to three rounds of exploratory and confirmatory factor analysis.

Subjects disagreed about the world on 26 normally-distributed meaningful and reliable dimensions (Figure 1 in supplement). Two had been previously studied: beliefs in a just and dangerous world. Typically, ~55% of item variability was explained by just three primals—formally called *secondary primals* but informally the ‘big three’—consisting of beliefs that the world is *Safe* (vs. dangerous), *Enticing* (vs. dull), and *Alive* (vs. mechanistic). These three primals intercorrelate, comprising the three main dimensions of an overarching belief that the world is *Good* (vs. bad), the general factor, also called the *primary* primal. Despite adopting a positive labeling convention; ‘big three’ *Safe* is conceptually identical to the common (but not universal)

interpretation of the BDW scale. Top-loading items on *Safe* include *On the whole, the world is a dangerous place* and *Real danger is everywhere, even if we don't notice it*. 'Big three' primals are also themselves multi-dimensional, each breaking out statistically into several lesser primals, called *tertiary* primals. 'Big three' *Safe* involves seven of these tertiary primals, as follows: *Just*—which is conceptually and empirically identical to Belief in a Just World—as well as the beliefs that the world is *Stable* (vs. fragile), *Pleasurable* (vs. miserable), *Harmless* (vs. threatening), *Progressing* (vs. declining), *Cooperative* (vs. competitive), and *Regenerative* (vs. degenerative).

The Primals Inventory measures all 26 primals (1 primary, 3 secondary, and 22 tertiary) and is currently the most accurate and comprehensive measure of primal world beliefs (for a review, see Clifton in press-b). It is partly best by default and also because it was developed using several techniques to prioritize content validity often at the expense of reliability, ensuring dimensionality would emerge only if latent phenomena actually existed. In one study, many high-performing items were removed to test if subscales relied on signal from the underlying phenomenon rather than variance defined by bloated specifics (i.e., redundancy-generated artifacts). In all studies, item order was randomized differently for each participant. Nevertheless, even though most scales involved only four items at least one of which is opposite-scored, subscales were reliable, factor structures were stable, and further replication and invariance testing is forthcoming (Bartholomaeus & Clifton, 2020). Three test-retest studies across 2-weeks, 9 months and 19 months indicated that, outside IQ, primals are among the most stable individual difference variables psychologists measure. Primals were orthogonal to most demographic variables yet strongly correlated with many personality and well-being variables in a pattern consistent with the possibility that a major source of human behavior has been overlooked. Clifton and colleagues' (2019) specify eight areas for further research. One is politics.

Primals' Connection to Politics

Proponents of the proposition coupling conservatism with dangerous world belief have good reason to suspect that political behavior is a promising domain to observe primals' impact. Politics, more than many human endeavors, admit alternative interpretations of facts and even

the most informed voter must generate opinions on topics where few facts are known. If primals function as schemas that inform the interpretation of ambiguity (Janoff-Bulman, 1989), individuals should rely on primals to form many political opinions. For example, consistent with the proposition in question, increased spending on the military may seem more prudent the higher one's base rate for national security threats. In this way, a primal shapes policy and political ideology—at least theoretically. But *which* primals shape politics?

A first step towards answering this question is to examine which primals correlate with political ideology. The literature predicts that 'big three' *Safe* (vs. dangerous) should strongly correlate with political conservatism. But pre-registered hypothesis for the current investigation holds that *Safe* will be virtually orthogonal to political ideology. This was because two of the very first studies to use the Primals Inventory suggested (a) incongruence in correlation matrices; (b) a BDW scale validity issue; (c) orthogonality with conservatism; and (d) strong correlations between political ideology and other primals.

Incongruence in Correlation Matrices

Outside politics, conservatives do not seem to behave like people who see the world as dangerous ought to behave. Fifteen sensible correlates of seeing the world as dangerous include less agreeableness, less curiosity, less optimism, less gratefulness, less trust, and more neuroticism (personality variables); more negative emotion, more depression, and more anxiety (clinical variables); and less life satisfaction, less positive emotion, worse relationships, less meaning in life, less accomplishment, and lower overall wellbeing (positive psychology variables). These outcomes flow naturally from the perception that that the individual is in a place—like a warzone or snake pit—where ambiguity probably hides dire and numerous threats. Moreover, in an initial study of 524 Americans using an early version of the Primals Inventory, correlations between *Safe* and all fifteen of these variables were quite large and significant, ranging from r=-.43 (agreeableness) to r=.61 (optimism), with replication forthcoming (Clifton et al., 2019; Clifton, 2020b). Yet few of these fifteen variables distinguish conservativism, and those that do usually do so in the wrong direction (Carney et al., 2008; Jost, 2006). For example, conservatism has been

repeatedly associated with less neuroticism, less depression, more optimism, and more life satisfaction (Napier & Jost, 2008; Schlenker et al., 2012). This incongruousness has puzzled researchers (Dallago et al., 2012; Van Hiel et al., 2007). Jost and colleagues (2003, p. 362) wonder, "To the extent that conservatives are more generally fearful than others, one might expect that they would also exhibit higher levels of neuroticism, but this does not generally seem to be the case." One explanation might be Laham and Corless' (2016) suggestion that conservatives may not be more fearful than liberals, but fear different threats.

Scale Validity Issue

Though a valuable social attitude measure, the BDW scale may suffer from what psychometricians since Brigham (1930) call the *naming fallacy* in which items measuring a narrow phenomenon are given a broad scale label (Laham & Corless, 2016). Dangers come in many forms, including natural disasters, predators, war, disease, car accidents, fires, falls, pollution, and poisoning. BDW scale items mention none of these dangers.[1] The focus is instead the intentional actions of strangers primarily in the form of crime and six of ten items concern societal and moral decline. This is too narrow. Assuming belief in societal decline is sufficiently close to belief in world decline (i.e., low scores on the Primals Inventory *Progressing* subscale), *Progressing* is just one of seven components of 'big three' *Safe*. This implies some BDW scale items may be double-barreled and, more importantly, BDW scale scores may target *Progressing* and neglect other components, such as *Just* and *Stable*, which a small validity study confirmed but requires replication (*N*=122; BDW and *Progressing*: r=-.72; BDW and *Just r*=-.34; Clifton et al. 2019).

Safe's Orthogonality With Conservatism

[1] In fairness, the Primals Inventory mentions none of these dangers either (see Table 1 of supplement for side-by-side comparison). Because Lipkus (1991) demonstrated that measures of world beliefs can opt out this level of granularity entirely, Primals Inventory items concern broad qualities, such as *danger*, *fragility*, *decline*, and so forth. But if the measurement strategy involves pooling items about particular dangers, a variety of dangers must be examined.

The BDW scale's selective representation of dangers only becomes a serious problem for political ideology research unless examined political ideologies happen to score (a) oppositely on those dimensions and (b) equally on overall dangerous world belief. In the same initial study of 524 Americans, this too was found to be the case. Conservatism was negatively related to *Progressing*, positively related to Just, and almost perfectly orthogonal to the general belief that the world is *Safe* (r=-.03, p<.05; Clifton et al. 2019). This is highly inconsistent with previous research and also requires replication.

More Predictive Primals

If belief in a dangerous world is not related to political conservatism, might other primals be more relevant? In early studies, most primals were as uncorrelated to conservatism as *Safe*. Yet conservatism was positively related to *Intentional*, *Just*, *Alive*, *Acceptable,* and *Hierarchical*, and negatively to *Worth Exploring*, *Progressing*, *Interconnected*, and *Cooperative*. By a considerable margin, the belief that the world is *Hierarchical* was most related.

The Belief that the World is Hierarchical

Hierarchical is not the belief that hierarchies are common or commonly emerge—on that most people would agree—but that hierarchy is inherent and natural to all things such that everything can be meaningfully ranked by differences in real value. In other words, much like how belief in a dangerous world concerns the prevalence of threat, *Hierarchical* concerns the prevalence of differences that matter. An example top-loading forward-scored item states *Humans, animals, plants, and pretty much everything else can be organized by how important or good they are*. This perspective is epitomized by the medieval philosophy of *The Great Chain of Being* depicted by Fray Diego de Valades (1579; Figure 2 in supplement) which organizes all entities along a superior-inferior dimension, including angels, humans, birds, fish, animals, and plants. Those who hold the world as nonhierarchical, in contrast, see most differences as surface-level, artificial, and typically meaningless. An opposite-scored item reads, *Most things aren't better or worse. It's hard to organize the world into hierarchies, rankings, or pecking orders that reflect true differences*.

Hierarchical has unusual psychometric properties. Whereas most candidate primals emerged across exploratory analyses of tweets, focus groups, and so forth, *Hierarchical* emerged almost exclusively from historical texts. Whereas most candidate primals involved obvious correlates (e.g., *Good* and optimism), *Hierarchical* was identified with no political implications in mind. Whereas most tertiary primals correlate strongly with *Good*, *Safe*, *Enticing*, or *Alive*, *Hierarchical* is among the few that stand apart. Finally, whereas most primals are highly predictive of many variables, *Hierarchical* appears to be a poor predictor of most everything besides political ideology. Orthogonality with demographic variables like income suggests that *Hierarchical* scores do not reflect motivated reasoning to justify personal status. Orthogonality with social desirability suggests that scores likely do not reflect sensitivity to appearing prejudiced (perhaps stronger among liberals). Orthogonality with most personality, clinical, and wellbeing variables (e.g., neuroticism and depression) makes *Hierarchical* a better fit for driving conservatism than dangerous world belief because no strong theoretical reason connects *Hierarchical* to these other variables. There would be no incongruence in the correlation matrix.

A relationship between *Hierarchical* and conservatism complements existing political ideology research, including work on right-wing authoritarianism, social dominance orientation, and moral foundations. Birthed out of a desire to explain the rise of fascism in the early 20th Century (Adorno et al., 1950), the definition of right-wing authoritarianism has evolved over the decades. Today it is generally understood as an affinity for established authorities within the group and an aversion to out-groups (e.g., Whitley Jr., 1999). Relatedly, social dominance orientation concerns the preference that groups be organized along a superior-inferior dimension with one's own group at the top (Pratto et al., 1994). Haidt and Joseph (2007, p. 382) suggested that five moral foundations (i.e., values) may shape political ideology.

1. Care/harm – Protect and care for young, vulnerable, or injured kin
2. Fairness/cheating – Reap benefits of dyadic cooperation with non-kin
3. Loyalty/betrayal – Reap benefits of group cooperation
4. Authority/subversion – Negotiate hierarchy, defer selectively

5. Sanctity/degradation – Avoid microbes and parasites

Loyalty, authority, and sanctity tend to distinguish conservatives, with right-wing authoritarianism and social dominance orientation distinguishing conservatives even more so (Graham et al., 2009). The belief that the world is *Hierarchical* is conceptually related yet distinct from these constructs because *Hierarchical* (a) does not involve a preference for what should be (i.e., is not a value) and (b) concerns the world generally, not merely human inter-group or intra-group relations. Similarly to how the belief that intelligence is improvable has been shown to be a loosely-related instantiation of the broader belief that the world is *Improvable*, right-wing authoritarianism and social dominance orientation may be human group-specific instantiations of *Hierarchical* (Clifton et al. 2019).

If, in addition to *Hierarchical*, conservatives see the world as more *Just*, then perhaps what is higher in the hierarchy and lower in the hierarchy is thought to deserve its station. Other politically-relevant primals might further shape how reality is interpreted. In this way, a primals-centric account of political ideology was emerging based on *Hierarchical* rather than dangerous world belief. However, the relative value of seemingly important but less predictive primals remained unclear.

To summarize, it is widely accepted that political conservatism correlates with and is increased by the belief that the world is dangerous. But preliminary results using a more nuanced measure suggested otherwise; that previous findings were misleading due to a scale validity issue; and that other primal world beliefs are more promising than belief in a dangerous world. Therefore, hypotheses were preregistered on the Open Science Framework, summarized as follows:

- *Safe* (along with most primals) would continue to poorly predict political ideology.
- *Hierarchical* (and a few others) would be far superior predictors.
- The BDW scale would continue to over-represent ways conservatives see the world as dangerous and under-represent ways liberals see the world as dangerous.

These hypotheses are examined in the following two studies.

Study 1: Which Primals Explain Variance in Political Ideology?

Study 1 examines eight samples to more firmly establish which primals relate to political ideology and which do not.

Samples

Sample 1: AH.Org.

AuthenticHappiness.Org is a website where the public can voluntarily participate in wellbeing research. Of 1,067 completed surveys from November, 2015 to April, 2019, 61 were excluded for failing attention checks and 233 for identifying as non-political, leaving 773 (M_{age}=44 years, SD_{age}=15). They were 81% female, 75% white, and 66% college graduates.

Sample 2 and 3: YM.Org Americans and non-Americans

YourMorals.Org is a website where the public can voluntarily participate in political research. Of 2,331 complete surveys from November, 2018 to August, 2019, 429 were removed for failing attention checks and remaining split into two samples: 1,422 Americans and 480 non-Americans (this split was not pre-registered because the author did not realize many subjects would be non-American). Americans (M_{age}=36 years, SD_{age}=14) were 65% male, 75% in or had completed college, 378 Republican/Republican leaning, and 736 Democrat/Democrat leaning. Non-Americans (M_{age}=33 years, SD_{age}=13) were 60% male; 72% in or had completed college; 65% from the U.K., Australia, or Canada; with 61 countries represented. Additional subjects were excluded from various analyses below due to missing data, as specified. Terms “conservative” and “liberal” were explained when appropriate because they can have different meanings in non-American contexts.

Sample 4: Immigrants

American immigrants from India (n=47), West Africa (n=45), and South Korea (n=53) were recruited Spring 2019 via (a) flyers around the University of Pennsylvania; (b) undergraduate social media networks; and (c) immigrant student groups in the Philadelphia area. Subjects received $5 Amazon gift cards. Initial analysis indicated Primals Inventory scales were highly unreliable among Indians, suggesting need for cultural adaptation of the instrument, and

were removed before further analysis, leaving 98 subjects. All were non-white, 71% 2nd generation immigrants (primarily college age), 72% female, and 19 self-identified conservatives.

Sample 5: Philly Pros

Of 120 Philadelphia-area lawyers, car salespersons, and police officers recruited from January 2018 to March 2019, 10 were excluded for failing attention checks and 20 for identifying as non-political, leaving 80 (M_{age}=48 years, SD_{age}=12). These were 80% white, 73% male, 40% Republican/Republican leaning and 60% Democrat/Democrat leaning.

Sample 6: Undergraduates

Of 497 University of Pennsylvania undergraduates participating for course credit in Spring 2018, 24 were removed for failing attention checks and 152 for identifying as non-political, leaving 321 (M_{age}=20 years, SD_{age}=1). They were 50% white, 60% Freshmen/Sophomores, and 76% female, with 57 Republican/Republican leaning and 264 Democrat/Democrat leaning.

Sample 7: 2019 mTurkers

Of 705 subjects recruited via Amazon Mechanical Turk in December 2019, 94 were removed for duplicative IP addresses or failing attention checks, leaving 611 (M_{age}=37 years, SD_{age}=12 years). They were 51% male, 71% white, and 82% college graduates.

Sample 8: 2015 mTurkers

All samples above were administered during the Trump administration. To examine more diversity across time, this study includes the earliest sample in which Primals Inventory items were ever administered. Of 930 mTurk subjects recruited October 2015 (Study 1 in Clifton et al., 2019), 175 were excluded for identifying as non-political, leaving 755 (M_{age}=37 years, SD_{age}=12). They were 57% female, 81% white, and 54% college graduates.

Measures

The Primals Inventory involves 99 items, with 39 reverse-scored. It measures the 26 primal world beliefs identified in Clifton and colleagues' (2019) effort to map major primals humans hold. Table 2 in supplement displays descriptive statistics. Preregistered hypotheses highlight the 29-item *Safe* subscale (16 items are reverse-scored) and 5-item *Hierarchical*

subscale (1 reverse-scored). In six samples, political ideology was measured using minor variants of a typical single item measure—*Which of the following best describes your political orientation?*—with six or seven response options from *Very Liberal* to *Very Conservative*. In Sample 5 and 6, party affiliation was used as a proxy for political ideology.

Analysis

Except for sample 8, hypotheses were identified on the Open Science framework before data was analyzed. To determine which primals correspond to political ideology, the percentage of variance (r^2) in political ideology explained by each primal was examined. Because political ideology was ordinal and skewed in some samples, r^2 was computed using Kendall's τ b (a nonparametric test) and converted using instructions from Walker (2003) and Strahan (1982). PI-99 data was ipsatized consistent with previous research. Sample-weighted mean % variance explained in Figure 1 does not include the two samples using party as a proxy for political ideology (6 sample total: N=3,333), though the impact of this exclusion was examined, as well as the role of YourMorals.org samples where *Hierarchical* explained higher variance.

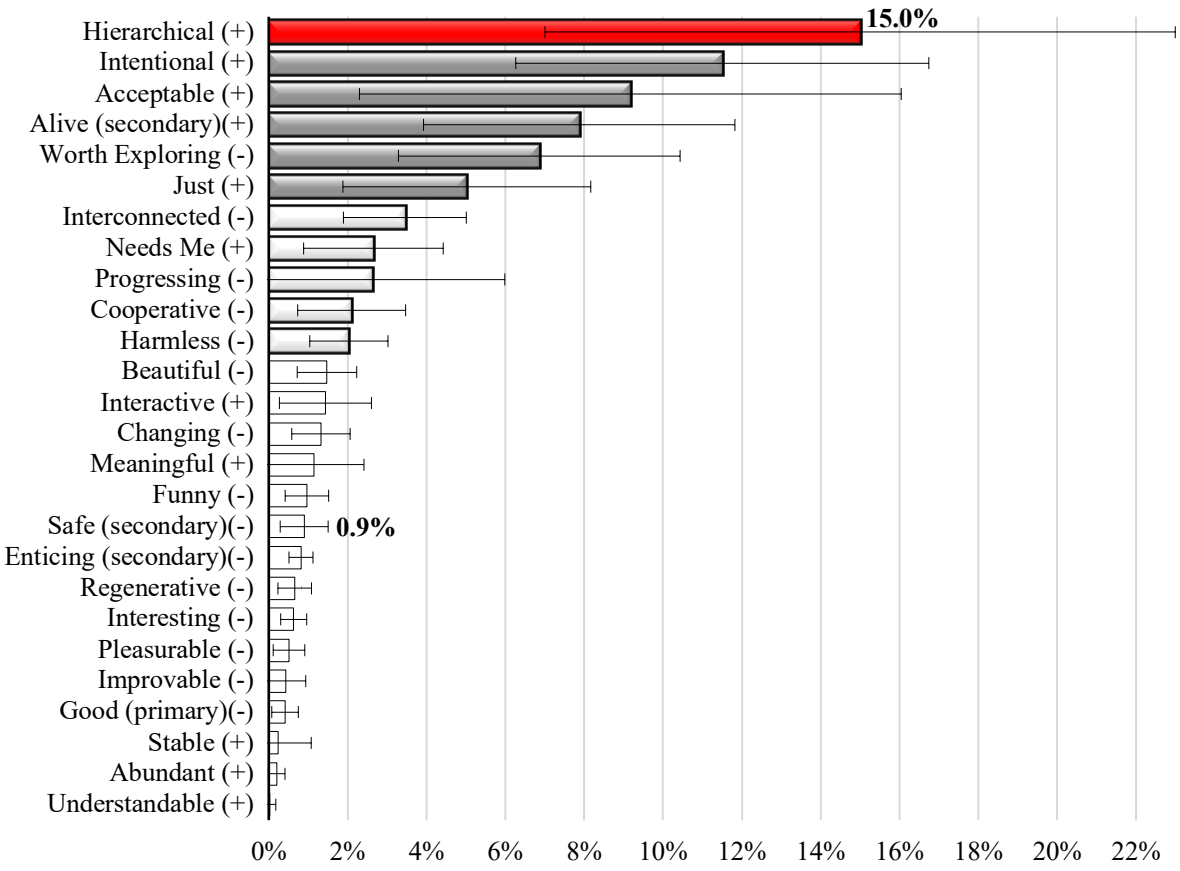
Results

As Figure 1 shows, *Safe* explained .9% of the variance in political ideology across samples (95% CI: [.3%, 1.5%]) while *Hierarchical* explained 15% (95% CI [7.0%, 23.0%]). This puts *Safe* in the middle of a group of 15 primals explaining between 0% to 1.5% of variance in political ideology, all with narrow confidence intervals, which were labeled *the primals of virtual agreement* across the political spectrum. In Sample 5, 6, and 7, the correlation between *Safe* and conservatism was positive, indicating subjects who were more conservative saw the world as safer than their liberal counterparts. The next five primals were labeled *the primals of mild disagreement*, ranging from 2% to 3.5% of variance explained, followed by five *primals of moderate* disagreement, ranging from *Just* (5%) to *Intentional* (11.5%). *Worth Exploring* at 6.9% was negatively related. At 15%, *Hierarchical* was labeled *the primal of marked disagreement* between political ideologies. When the two samples using party affiliation as a proxy for political ideology were included in the mean (N=3,734), variance explained decreased on average 0.2%

across primals, with *Hierarchical* and *Safe* falling to 13.8% and .4%, respectively. The relative ranking of most primals was also not dependent on the two samples recruited from YourMorals.org where *Hierarchical* explained especially high variance: 28.4% and 31.5%, respectively. When excluding these samples, *Hierarchical* remained the most predictive while dropping considerably from 15% to 8.1% and *Safe* was impacted marginally, dropping from .9% to .8% variance explained. Table 3 in supplement provides sample-specific results.

Figure 1

% of Variance Explained in Political Ideology by Each Primal With 95% Confidence Intervals



Note. (-) indicates negative relationships with conservatism. Because two of eight samples were excluded from weighted average for using party as a proxy for political ideology, total *N*=3,333.

Discussion

Study 1 replicated in eight samples more diverse and together seven times larger (*N*=3,734) than that used previously.

Did Safe remain a poor predictor of political ideology?

Increased conservatism was repeatedly associated with little difference in the belief that the world is dangerous. In the only sample where *Safe* explained more than 2% of the variance in political ideology (9.1% in Sample 5: Philadelphia-area professionals), the relationship was positive, indicating it was Democrats who saw the world as dangerous. This one sample is also not responsible for *Safe*'s low mean variance explained (.9%) since Sample 5 was excluded from how the mean was calculated for relying on party information as a proxy for political ideology. Such results are surprising for being inconsistent with previous research coupling conservatism and belief in a dangerous world.

Do conservatives and liberals see the world differently?

The majority of primals were labeled *primals of virtual agreement* across the political spectrum. These include the beliefs the world is *Abundant*, *Stable*, *Interesting*, *Changing*, *Understandable*, *Safe*, *Pleasurable*, *Regenerative*, *Enticing*, *Interactive*, *Meaningful*, *Beautiful*, *Funny*, *Improvable*, and generally *Good*. Such near orthogonality conflicts with not just the dangerous world proposition, but various other theories of political ideology. This includes Ball's (2016) suggestions that conservatives tend to see the world as a bad place and constantly changing (which should be reflected by lower *Good* and *Changing* scores); and Duckitt's (e.g., Duckitt et al., 2002) suggestion that conservatives see the world marked by instability (which should be reflected by lower *Stable* scores). When it comes to primals, liberal and conservative subjects saw the world similarly in most respects.

Did Hierarchical remain the best predictor of political ideology?

Hierarchical explained 15% of the variance in political ideology, much more than any other primal and sixteen times more than *Safe*. Still, heterogeneity was considerable. Despite a future expected range between 7% and 23%, in one sample (Sample 5), τ was nonsignificant, suggesting that even *Hierarchical* will not always be relevant. Furthermore, covariance was especially high because of Sample 2 and 3, where it explained ~30%. This may be because YourMorals.Org subjects are more politically-minded than those recruited from

AuthenticHappiness.Org and because the YourMorals.org political ideology measure included not only the 7-point *very liberal* to *very conservative* response options, but three 'opt-out' type response options (*Libertarian*, *other*, and *Don't know/not political*) where other samples had one option. This may have excluded more subjects lacking definite opinions, resulting in less error. Regardless, if one assumes that these samples were outliers and removes them from analysis, *Hierarchical* remains the primal most associated with political ideology and *Safe* remains a poor predictor.

What primals seem to offer the best bases for theorizing about political ideology?

Hierarchical was followed by five primals each explaining at least five times more variance in political ideology than *Safe*. Among these, *Alive* is discounted because higher correlations with *Intentional* (one of three tertiary primals associated with *Alive*) indicates that the secondary level is not the appropriate level of granularity to consider (see advice from Clifton, in press-b). Moreover, because *Intentional* (the 2nd most predictive primal) could be partly an artifact of increased religiosity among conservatives and *Acceptable* (the 3rd most predictive) may involve some construct overlap with conservatism, *Hierarchical*'s prominence is remarkable, further justifying its status as the sole *primal of marked disagreement* across the political spectrum.

The next group of primals, the *primals of mild disagreement*, include *Interconnected*, *Needs Me*, *Progressing*, *Cooperative*, and *Harmless*. Based on variance explained, these primals may not be central to political ideology while still providing insight into how hierarchy is sometimes perceived. For example, in a recent Primals Inventory translation effort, Stahlmann and colleagues (2020) found evidence of a novel secondary primal in a German sample (*N*=592). Labeled *Communal*, this belief combines many of the same tertiary primals that predict political ideology in Study 1—providing some cross-cultural validation—but with greater emphasis on *Cooperative* such that the hierarchy is seen as itself resulting from a process of ruthless struggle.

The finding least consistent with pre-registered hypotheses concerned *Progressing* which explained only 2.6% of the variance in political ideology. Nevertheless, the author proposes that *Progressing* be incorporated into a primals-centric account of political ideology until further

research across time periods confirms its unimportance. Seven of the eight samples were collected during a time of prosperity for humans generally (during the economic boom just prior to the Covid-19 pandemic) but a terrible period for liberals specifically, in Trump's America and the rest of the English-speaking world (e.g., Brexit). Yet a notable comparative tendency among liberals to see the world as getting better was preserved. To explore the impact of contemporary events, the author compared two similar national USA samples recruited the same way from the same source (mTurk): Sample 7 was recruited early December 2019—just over three years into the Trump presidency and at the height of the presidential impeachment drama—and Sample 8 in late October 2015—late in Obama's 7th year in office and three months before any 2016 Presidential primaries. Then candidate Trump was an intermittent poll leader and broadly considered a temporary phenomenon. In 2019, *Progressing* explained virtually no variance in political ideology (.2%). Back in 2015, however, it explains 10.3%, statistically tied with *Hierarchical* (10.1%). This shift may be a clue that, though primals are generally stable, *Progressing* may be more responsive to news events compared to other primals and may be relevant to political ideology even though sometimes it may appear less relevant.

Thus, if any primals play a role in political ideology, the following six seem most promising: *Hierarchical, Intentional*, *Just*, *Worth Exploring*, *Acceptable*, and *Progressing*.

Study 2: The Broader Nomological Net

If the belief that the world is dangerous is a poor predictor of conservatism, why did previous correlational research suggest otherwise? Clifton and colleagues' (2019) small validity study suggested one possible explanation, but would results replicate? Moreover, do the six highlighted primals, especially *Hierarchical*, predict political ideology because they are repackaging known correlates of conservatism that concern hierarchy-related topics, including Right-wing authoritarianism, Social Dominance Orientation, and Moral Foundations (Care/harm, Fairness/cheating, Loyalty/betrayal, Authority/subversion, and Sanctity/degradation)? To address these questions, Study 2 examines the broader nomological net of political psychology variables.

Samples

Study 2 involved a closer examination of Study 1 samples that included measures of other political constructs. This included the two YourMorals.Org samples, which for Study 2 purposes were combined because fewer subjects completed relevant measures, and the 611 Americans recruited via mTurk (Sample 7). No YourMorals.Org subjects took the BDW scale. mTurk subjects completed all measures, including the BDW scale, in the order listed below.

Measures

See descriptive statistics in Table 4 of supplement.

Primals Inventory

For Study 2, in addition to *Hierarchical* and *Safe*, the particular interest was *Safe*'s seven associated tertiary primals (*Pleasurable*, *Regenerative*, *Progressing*, *Harmless*, *Cooperative*, *Stable*, and *Just*).

BDW Scale

Perry, Sibley, and Duckitt's (2013) BDW scale consists of ten items, including five reverse-scored items. As discussed above, it measures one variable intended to be a belief about the social world, though consistent with the scale label it is more often treated as a belief about the world generally (e.g., van Leeuwen & Park, 2009). See items in Table 1 of supplement.

MF-30

The MF-30 (Graham et al., 2008) measures the five moral foundations (i.e., values) of Moral Foundations Theory. Subscales include six items administered every fifth item. Three items use response options *extremely relevant* to *not at all relevant* and three items use *strongly agree* to *strongly disagree*. No items are reverse-scored. An example item from the Authority/subversion subscale is *Respect for authority is something all children need to learn*.

Right-Wing Authoritarianism

Most Right-Wing Authoritarianism (RWA) scales are permutations of Altemeyer's 30-item (1988) scale, including Zakrisson's (2005) 15-item version used in this study that employs seven reverse-scored items. An example is *Our country needs a powerful leader in order to destroy the radical and immoral currents prevailing in society today*.

Social Dominance Orientation

To measure Social Dominance Orientation (SDO) Pratto and colleagues' (1994) original scale was used, consisting of 16 forward-scored items. The first item is *Some groups of people are simply inferior to other groups*.

Political Ideology

Study 2 used the same political ideology measure uses in Study 1.

Analysis

Pairwise Pearson *r*s between primals and BDW scale scores were compared to those found by Clifton and colleagues (2019, *N*=122) with significance of differences calculated using a 2-tailed Fisher *r*-to-*z* transformation (Table 5 of supplement). Pairwise relationships between the six primals identified above and RWA, SDO, and Moral Foundations were also examined (Table 6 and 7 of supplement). To further determine how the six primals fit within the nomological net and also how they compare with *Safe* scores, 12 exploratory linear regressions were run (summarized in Table 8 of supplement). These rely on the mTurk sample (*N*=611), duplicating models in YourMorals.Org data whenever >300 subjects took relevant measures.

Results

BDW scale scores were strongly related but not redundant with 'big three' *Safe* (*r*=-.67) partly because BDW scores unevenly reflected *Safe*'s dimensionality, emphasizing some primals (*Progressing*, *r*=-.66, and *Harmless*, *r*=-.67) and deemphasizing others (*Just*, *r*=-.30, and *Stable*, *r*=-.41). The average difference in *r* across all 26 primals was .06 with one significant difference (*Intentional*). *Hierarchical* and the other primals identified above did not strongly correlate with known correlates of conservatism, triggering no concerns over construct redundancy. Among 611 mTurkers, both *Hierarchical* and BDW scale scores were moderately related to RWA, SDO, and Authority. Among YourMorals.Org subjects, these relationships were higher. Moreover, the divergence between the BDW scale and *Safe* mattered when it came to political ideology and its correlates. The most striking example was in relationship to RWA, which was strongly related to BDW scale scores (*r*= .44) but orthogonal to *Safe* (*r*=-.03). *Safe* was not related to conservatism

(r=.08, p>.05) but BDW scale scores were, though not strongly (r=.20, p<.001). Exploratory linear regression models indicated that the six proposed primals of political ideology explained 19.3% (mTurk) and 43.2% (YourMorals.org) of the variance in political ideology. Adding the 20 other primals neglibly increased variance explained. The six primals explained less than Moral Foundations explained (29% in the mTurk sample). These 11 variables (six primals and five moral foundations) explained almost no variance in political ideology not already explained by RWA and SDO, which together explained 35%. Both the six primals and the five Moral Foundations explained large portions of variance in RWA, 47% and 52% respectively. Regression analyses also found that *Safe* was not merely a poor predictor of political ideology, but that, among *Safe*'s seven associated tertiary primals, *Just* (one of the six proposed primals) was the sole predictor of any consequence.

Discussion

Study 2 replicated Clifton and colleagues' (2019) main findings in a sample five times larger.

Did the BDW scale over-represent ways conservatives see the world as dangerous?

It is increasingly clear that previous correlational research has relied on a scale which overemphasizes dangers conservatives fear (e.g., decline) and underemphasizes dangers liberals fear (e.g., injustice) when neither group is much more likely to see the world as generally more dangerous. Results imply an alternative "Dangerous World Scale" could be readily created showing liberals as the ones who see the world as dangerous, potentially explaining why previous correlational research misled researchers. This validity misstep warrants re-evaluation of research that has relied on the BDW scale to operationalize belief that the world is dangerous, including non-political research (e.g., Murray and Schaller 2012; Miller, Zielaskowski, and Plant 2012; Schaller, Park, and Faulkner 2003; Schaller, Park, and Mueller 2003). Moreover, above findings also call into question the centuries-old Hobbesian connection between the belief that the world is dangerous and right-wing authoritarianism. If conservatives do not actually see the world as more dangerous, their well-documented affinity for authority must come from somewhere else.

Are the six more promising primals redundant with existing political constructs?

Study 2 results indicate yes and no. *No* because the six primals identified in Study 1 are clearly not redundant with Moral Foundations, RWA, or SDO. *Hierarchical* correlated with RWA at only r (620) =.39 and with SDO at only r (620) =.32. Such modest relationships suggest that right-wing authoritarianism and social dominance orientation can be understood as human-specific and human-group-specific instantiations of a much broader belief about the world. In correlating positively with Authority, Sanctity, and Purity and negatively with Care and Fairness, *Hierarchical* correlates to moral foundations similarly to how conservativism correlates to moral foundations. However, the answer is also *Yes* because the six primals identified in Study 1 explained almost no variance in political ideology not already explained by RWA and SDO. Indeed, RWA also explained the same variance in political ideology provided by Moral Foundations. With all these constructs competing to explain the same variance in political ideology, the question is, what causes what?

General Discussion

This investigation challenges a central proposition in the political psychology literature while providing an explanation for why previous research may have been misleading. In short, researchers have thought that conservatives and liberals inhabit two perceived worlds where opposite political behaviors make more sense: some see the world as a dangerous place full of threats (conservatives), driving policy preferences such as keeping criminals locked away, keeping immigrants out, and keeping guns for protection. Some see the world as safer (liberals), allowing more room for being forgiving, welcoming, and weaponless. But above results show that conservatives and liberals see the world as about equally dangerous and previous studies seem to have found otherwise because the main measure of dangerous world belief happened to highlighted threats conservatives fear while neglecting threats liberals fear.

This is consonant with emerging research on other threat-relevant political constructs (for a review, see Duckitt, 2020). In some large samples (total N=24,391), conservatives more concerned by threats of commission (i.e., aggression), liberals were more concerned by threats of

omission (i.e., neglect), with no overall difference in threat sensitivity (Kahn et al., 2020). A meta-analysis of 134 samples (*N*=369,525) found statistically significant yet fairly trivial relationships between conservatism and mortality salience (*r*=.08), subjective threat perception (*r*=.12), and objective threat experience (*r*=.07), and a nonsignificant relationship to fear of death (*r*=.02; Jost et al., 2017). Likewise, in the present investigation, the belief that the world is dangerous explained only .9% of the variance in political ideology, placing it nearly in the middle a large group of fifteen primal world beliefs—just below the belief the world is *Funny* at 1.0%—sharing so little variance with political conservatism that they were dubbed *the primals of virtual agreement across the political spectrum*.

Six primals, however, notably distinguished political ideology, as follows:

- *Hierarchical* (vs. nonhierarchical) is the belief that most things have differential value and can be ranked (positively related to conservatism, explaining 15.0% of variance).
- *Intentional* (vs. unintentional) is the belief that most things happen for an underlying purpose (positively-related, 11.5%).
- *Acceptable* (vs. unacceptable) is the belief that the world and most things in it are best accepted as is (positively-related, 9.2%).
- *Worth Exploring* (vs. not worth exploring) is the belief that everything is worth trying or doing, at least once (negatively related, 6.9%).
- *Just* (vs. unjust) is the belief that the world is a fair place where you typically get what you deserve, for good or ill (positively-related, 5%).
- *Progressing* (vs. declining) is the belief that the world is getting better instead of worse (negatively-related, 2.6%).

These primals may distinguish political ideologies because they describe two other perceived worlds in which opposite political behaviors make sense.

Two Other Perceived Worlds

While all individuals see the universe as full of different things, individuals may systematically interpret the meaning of difference differently. One group (conservatives) may tend

to assume differences are important, reflecting an underlying value structure that is not just natural and pervasive, but even cosmically ordained. What has more value is treated fairly—and thus finds its way to the top—and what has low value and not worth exploring is too treated fairly—and finds its way to the bottom. For this reason, the current state of affairs—whatever it is—should probably be accepted as it is, not because it can't be changed, but because it probably shouldn't be. Unfortunately, however, change is part of life and the world's hierarchies are being slowly eroded. Thus, constraining change to the status quo and accepting inequality is just common sense (i.e., the two parts of conservatism as commonly defined).

Another group (liberals) may tend to assume differences are unimportant, reflecting superficial, arbitrary differences in kind that rarely entail differences in value. Because everything is roughly equal, everything is equally deserving and worth exploring. Thus, they see existing hierarchical structures—in society, nature, and anywhere else—as typically unjust, oppressive, not acceptable as it is, and certainly not ordained by some cosmic force. Those on top rarely deserve their luck and those on the bottom rarely deserve their misfortune. Fortunately, however, change is a part of life, and this dismal state of affairs is slowing improving. Thus, accelerating change to the status quo and rejecting inequality is just common sense (i.e., the two parts of liberalism as commonly defined).

The notion that political ideology stems in part from these two perceived worlds—shorthanded *hierarchy theory*—offers intuitively appealing explanations of many conservative policy preferences. For example, punitive measures consistent with historical standards of punishment appear sensible if criminals presumably get what they deserve as part of society's natural order. Excluding immigrants appears sensible when it is presumed that real, natural, and meaningful distinctions underpin nationality. The dangerous world proposition does offer a better explanation of increased gun ownership, but in this case no explanation is needed. Stroebe, Leander, and Kurlanski (2017) found that BDW scale scores to be unrelated to gun ownership, being orthogonal to rifle ownership ($r(399)=-.02$, $p>.05$) and weakly related to handgun ownership

($r(399)=.10$, $p<.05$). If an explanation is needed, it is why those who see the world as dangerous are hardly bothering to arm themselves.

Hierarchy theory offers a superior explanation of why many correlates of conservatism arise. This includes a distaste for political correctness (which can be seen as glossing over differences); increased religiousness (because purpose underlies events); a general appreciation for wealthy persons (whose greater income implies greater value); tendencies towards authoritarianism and social dominance orientation (which treats differences as important); and personality characteristics such as low Openness (because many things are not worth exploring) and high conscientiousness (because the world rewards fairly; e.g., Carney et al., 2008; Jost, 2006). Turning to moral foundations, the dangerous world proposition poorly explains why conservatives score lower on care/harm because, in increasingly dangerous places, people typically become more concerned about safety issues, not less. Hierarchy theory, moreover, makes sense of why conservatives place greater value on loyalty, authority, and sanctity given their view of a just, even cosmically-ordained, hierarchy. A Hobbesian explanation tying the belief that the world is dangerous to authoritarianism can be constructed, but it is circuitous. When seeking to explain attitudes towards existing social hierarchies, the simpler explanation is probably the one involving general assumptions about hierarchy than general assumptions about danger. Finally, personality-based theories of political ideology, including the dangerous world proposition, have historically struggled to explain both parts of conservatism as commonly defined in psychological research as the tendency to (a) preserve the established order and (b) tolerate inequality (Hirsh et al., 2010). Hierarchy theory readily explains both. If differences reflects true value, considerable social inequality is not just appropriate but inevitable.

Limitations

One point of contention may be definitional. The term *world* in *primal world beliefs* refers to “an individual’s broadest psychologically meaningful habitat” (Clifton et al., 2019, p. 83). Most researchers typically use *world* more narrowly. For example, in depression research, Beck (e.g., Beck et al., 1979) labeled one leg of his Cognitive Triad *beliefs about the world* when he primarily

meant beliefs about familiar persons in one's immediate social context, such as a spouse or boss (personal communication, March 1st 2019). Duckitt (e.g., Duckitt et al., 2002) and other BDW researchers also define *the world* socially, though in their case primarily meaning strangers and their intentional actions. There may be a variety of research for which it is inappropriately retroactive to apply Clifton and colleagues' (2019) definition.

The causal implications of hierarchy theory is conjecture. While it looks like these are the six primals of political ideology, and it seems clear that they describe two worlds in which opposite political behavior makes sense, their correlational relationship to political ideology might be due to causality going in the other direction (e.g., primals could be *post hoc* rationalizations of a prior political commitments) or third variables (e.g., religiosity). Both the dangerous world proposition and hierarchical theory relies on cross-sectional research, which has limited value.

Other study limitations include the reliance on the Primals Inventory's *Hierarchical* subscale which, having been introduced alongside 25 other constructs, would benefit from more focused psychometric validation to determine the validity of the author's interpretation. Though *Safe* explained only .9% of the variance in political ideology, further research using multi-variate approaches will likely identify contexts in which the belief the world is dangerous is more relevant. Studies rely on a commonly used but simplistic 1-item measure of political ideology when unidimensional left-right understandings of political ideology are limited (Feldman, 2013). In most samples, there were more liberals than conservatives, which may indicate selection bias and overweighting the importance of primals delineating degrees of liberalism. Above findings are directly relevant to belief in a dangerous world research only, not other members of the threat-relevant family of constructs that Laham and Corless (2016) identifies. Finally, hierarchy theory is at best only a partial explanation of political ideology, since much variance in political ideology remains unexplained.

Future Directions

Hierarchy theory has a variety of implications for understanding human cooperation.

Contemporary political messaging

Hierarchy theory suggests strategies for political campaigning, messaging, and strategy, especially among Republicans most mischaracterized by the dangerous world proposition. If a politician's goal is to widen one's base and attract independents, the most effective strategy may be to appeal to primals about which there is more agreement. Obama's 2008 campaign messages "Yes, We Can," "Change We Can Believe In," and "Hope," imply that change is possible, which is presumably more appealing to those scoring high on *Improvable*, one of the 15 *primals of virtual agreement* across the political spectrum. However, if a politician seeks primarily to mobilize a base of supporters, messages appealing to primals that distinguish those supporters may be preferred. Many USA Republican presidential campaign messages, for example, call for a return to a better time in the past. Examples include *Make America Great Again* (2016 Trump campaign); *Are You Better Off Than You Were Four Years Ago* and *It's Morning Again in America* (1980 and 1984 Reagan campaigns); and *He's Making Us Proud Again* (1976 Gerald Ford's campaign). Such messages presumably appeal less to those who believe the past was worse than the present (i.e., those scoring high on *Progressing*; i.e., liberals). Likewise, slogans suggesting that intergroup or interpersonal differences are inconsequential may do poorly among those scoring high on *Hierarchical*. Example messages from the 2020 Democratic presidential primary include *We're All in This Together* (O'Rourke), *We Rise* (Booker), and *For Everyone* (Biden). Indeed, a great deal of liberal American political messaging, from Clinton's 2016 message *Forward Together* to William Jennings Bryant's *Equal Rights to All, Special Privileges to None*, should be relatively unappealing to those scoring high on *Hierarchical*, many of whom may expect that some people deserve special privileges. If so, messages of equality might help in primaries, but hurt in general elections. As a way of testing hierarchy theory versus the dangerous world proposition, experiments could compare the appeal of slogans about threat to slogans about difference.

Historical events

If hierarchy theory helps explain contemporary clashes between the forces of change and preservation, it may provide insight into how that contest has played out historically. Consider the

following example: Seligman (2019) suggests that the first millennia of the common era was marked by very little material progress. Then, starting in Western Europe circa 1450, an explosion of progress begins, spreads globally, and continues through the present. He asks, why the sudden growth? One piece of the puzzle may involve hierarchy theory. The worldview of the Medieval period is epitomized by de Valades (1579) *Great Chain of Being* (Figure 2 in supplement), Catholicism, the divine right of kings, and feudalism. Feudalism rests on a series of obligations between superiors and inferiors, with God at the top, sanctioning the hierarchy as divinely ordered. Not merely one's station, but experiences of all types, are interpreted as the deserved consequence of sin or good deeds (Ziegler, 2013). Medieval Europeans lived in the shadow of decaying Roman buildings, including structures they no longer knew how to build and infrastructure they continued to rely on, especially roads. The daily water supply of 12th century Latin Caesarea, for example, was supplied by several miles of Roman aqueducts built ~1,000 years prior (Reifenberg, 1950; Riley-Smith, 1990). Top Medieval thinkers (e.g., Aquinas, Averroes) were not considered great for new ideas, but for contextualizing old ones. Together, this suggests a society where individuals regardless of status would have likely scored high on *Hierarchical*, *Intentional*, *Just*, and *Acceptable*, and low on *Worth Exploring* and *Progressing*. Then came the Black Death in the 14th century which killed one third of Europeans, a scale of unprecedented loss in European history. Plague paid no respect to different persons, killing rich and poor, pious and evil alike. The resulting vast societal re-organization and social mobility further highlighted the meaningless of sacrosanct distinctions (Ziegler, 2013). Massive labor shortages resulted in massive wage increases, putting nobles at the mercy of peasants who increasingly negotiated better terms or left manors for the first time in generations. Layered on were the great changes of the Reformation, the Renaissance, Humanism, the discovery of an entirely unknown and promising continent, and the emergence of a powerful merchant class (e.g., the Medici) that defied traditional hierarchies. All this may have contributed to the primals of conservatism losing its grip on some segments of society.

Future human cooperation

This article began by noting that cooperation is a signature human adaptation but many cooperative efforts fail because of a conservative-liberal fault-line. If hierarchy theory is correct and primals reasonably malleable, two question follows. First, should societies seek to homogenize members' primals to maximize cooperative potential? Perhaps someday this may be a reasonable course, but certainly not yet. Primals research is in its infancy. Researchers have little idea whether and how primals can be changed or the net effects of change. It may be foolish (and unkind), for example, for liberals to try to decrease *Just* when previous research has tied low belief in a just world to depression and many other unwanted outcomes. However, as studies proceed, primals research does offer three things of immediate practical value for increasing cooperation: a measure that people can use to identify their own primals, terminology with which to discuss deeper disagreements that may (or may not) underlie political differences, and a modicum of increased understanding of where the other side is coming from—small but perhaps worthwhile contributions at this polarized time.

Second, if societies should eventually seek to homogenize its primals to maximize cooperative potential, in what direction? The path of societies seeking to lock in gains at the expense of future progress might be increased beliefs that the world is *Hierarchical*, *Just*, declining, not worth exploring, *Intentional*, and *Acceptable*. However, for societies prioritizing long-term progress, the path is less clear. If groups homogenize to believe that differences are meaningless, all outcomes unfair, and so forth, problems may result, such as grand short-sighted social experiments that fail (e.g., the French Revolution). Perhaps the ideal human society finds ways to manage—rather than eliminate—the inevitable tensions that arise between those who wish to preserve the current order, and those wanting to change it.

Concluding Remarks

The basic notion underpinning the psychological relevance of primal world beliefs is nothing new, being traceable to debates among Ancient Greek philosophers such as Heraclitus and Pythagoras. The basic notion is as follows: similarly to how perceptions of local environments leads to certain behaviors, perceptions of the global environment could lead to certain behaviors.

Over the last several decades, researchers applied this basic notion to political ideology, noting that dangerous world belief describes a pair of worlds in which many opposite political behaviors make sense. Confidence grew as correlational studies repeatedly tied dangerous world belief to political ideology, and experimental work in threat-related literatures found many complementary results. Still, some found it puzzling why, outside political contexts, conservatives did not seem to behave like people who see the world in this way ought to behave, and recently other literatures began unearthing less consonant findings (Duckitt, 2020; Laham & Corless, 2016).

Hoping further description might lead to explanation, the current investigation leverages the first reasonably comprehensive measure of primal world beliefs to identify which primals correlate to political ideology and which do not. The resulting profile shows three things. First, conservatives and liberals see the world as about equally dangerous. Second, previous literature had found otherwise because a previous measure highlights threats conservatives fear and neglects threats liberals fear. Third, six other world beliefs each explain several times more variance in political ideology than belief in a dangerous world and also describe a novel pair of worlds in which opposite political behaviors make sense. Because this research involves replication, preregistration, multiple samples, a few thousand subjects, and a more nuanced measure, researchers can have some confidence in these descriptive conclusions, if not the explanation they suggest. After all, just because behaviors are consonant with a belief does not mean the belief caused the behavior. Yet the same could be said of the dangerous world proposition. Hierarchy theory swaps out the primals, but the basic notion that made the dangerous world proposition attractive in the first place remains unchanged.

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CHAPTER 2 - TESTING IF PRIMAL WORLD BELIEFS REFLECT EXPERIENCES—AT LEAST SOME EXPERIENCES IDENTIFIED *AD HOC*

Abstract

Do negative primal world beliefs reflect experiences such as trauma, crime, or low socio-economic status? Clifton and colleagues recently suggested that primals—defined as beliefs about the general character of the world as a whole, such as the belief that the world is safe (vs. dangerous) and abundant (vs. barren)—may shape many of the most-studied variables in psychology. Yet researchers know very little regarding why individuals adopt their primals nor the role of experience in shaping primals. Many theories can be called *retrospective theories*; these theories suggest that past experiences lead to the adoption of primals that reflect those experiences. For example, trauma increases the belief that the world is dangerous and growing up poor increases the belief that the world is barren. Alternatively, *interpretive theories* hold that primals function primarily as lenses on experiences while being themselves largely unaffected by them. This chapter identifies twelve empirical tests where each theory makes different predictions and hypothesizes that retrospective theories are typically less accurate. I end noting that, even if retrospective theories are typically inaccurate, that does not imply experiences do not shape primals. I end by offering a conceptual architecture—the Cube Framework—for exploring the full range of human experience and suggest that, though psychologists have historically focused on negative, externally-imposed experiences of short-duration (e.g., trauma), positive, internally-driven, and longer-term experiences are also worth considering.

Introduction

After psychologists introduce new constructs, such as learned helplessness or grit (Abramson, Seligman, & Teasdale, 1978; Duckworth, Peterson, Matthews, & Kelly, 2007), many researchers eventually ask an important question: *Which experiences influence (or are influenced by) my construct?* Having recently introduced a construct (Clifton et al., 2019), I too turned to this question, beginning with a literature search for a tool that would enable systematic theorizing about a broad range of experiences in relation to my construct. What I found instead were a few organizing frameworks unsuited to this particular task of general theorizing (e.g. Duerden et al., 2018) and a handful of largely overlapping clinically-oriented checklists dominated by a particular type of involuntary, negative experiences of quick duration, such as injury or death of a family member (e.g., the Social Readjustment Rating Scale by Holmes & Rahe, 1967; the Life Experiences Survey by Sarason, Johnson, & Siegel, 1978). Moreover, despite positive psychology's promising departure from psychology's historical focus on negative experiences (Seligman & Csikszentmihalyi, 2000), the positive psychology literature has yet to produce commensurate checklists of positive experiences. Thus, absent the tool I sought, I conducted the sort of *ad hoc* process that is common among researchers. In this process, hypotheses emerge concerning those experiences the researcher happens to think of, often ones already examined in relevant literatures or ones intersecting personal experience. This process has weaknesses. Chief among them is that research can never support a reasonably adequate understanding of the role of experience if no reasonably comprehensive range of *things one personally encounters, undergoes, or lives through*—Miriam-Webster's definition of *experiences*—is ever considered. Thus, after discussing a newly introduced construct and engaging in a typical process of *ad hoc* literature-driven hypothesis generation, I conclude this chapter with an atypical offering: a simple yet comprehensive conceptual framework for considering the full range of human experiences called the *Cube Framework*.

The New(ish) Construct: Primal World Beliefs

For decades a few literatures have independently examined the possibility that particular dependent variables, such as political ideology and recovery from trauma, may stem from individual differences in generalized beliefs about the sort of world this is (Perry, Sibley, & Duckitt, 2013; Janoff-Bulman, 1989). The most studied of these beliefs is belief in a *Just* world, which is the belief that the world is a place where one gets what one deserves and deserves what one gets. Originally identified by Lerner (1965, 1980) to study the roots of blame and racism, *Just* has since been tied to dozens of variables that *Just* is thought to causally influence. In sum, those higher in *Just* tend to be kinder (presumably because the world rewards kindness); more hard-working (presumably because the world rewards hard work); more successful (because they've worked harder, were nicer, and are motivated to post-hoc justify success); and blame victims like the sick and poor (presumably because they probably got what they deserved). Clifton and colleagues (2019) recently pulled these world belief literatures together, calling beliefs about the basic character of the world *primals* or *primal world beliefs*, and engaged in an extensive empirical process to map all major primals. We found that *Just* was one of 26 different primals most of which had never been studied (see Figure 1 in appendix) and many of the new primals are more predictive of human behavior than *Just*, such as the belief that the world is *Beautiful* (vs. ugly) and *Pleasurable* (vs. miserable).

This suggests the plausibility of a truly remarkable scenario described by Clifton and Kim (2020, p. 1). In sum, understanding the behavior of any creature requires observations of that creature in multiple environments. But humans can only ever observe each other in one environment: the world. Not realizing we profoundly disagree about this world along many dimensions, human efforts to understand each other's behavior should lead inevitably to a specific type of failure: overexaggerating the importance of dispositional differences (i.e., the fundamental attribution error). Thus, it is theoretically possible that psychologists have overlooked a major source of variation of most of the most-studied variables in psychology. Clifton and

colleagues (2019) identify dozens of variables, such as BIG 5 personality traits and subjective wellbeing, that are perhaps impacted.

As research exploring the causal role of primals continues, it is worth asking a related but separate question: Where do primals come from? Specifically, which experiences shape (and are shaped by) primal world beliefs? The former question is broad and requires, among other things, a deep discussion of genetics and the ontology of personality traits, which is out of scope. This chapter concerns the more specific latter question about identifying relevant experiences.

Distinguishing Retrospective and Interpretive Theories

Theories of how experiences shape primal world beliefs often fall into two broad types: *retrospective theories* and *interpretive theories*. Retrospective theories suggest that experiences play a key role in shaping primals such that primals often reflect the content of the individual's background. In this view, for example, the rich are likely to see the world as more *Abundant*, the poor are likely to see the world as more barren (i.e., low *Abundant* scores), and experiencing dangerous environments locally should cause one to see the world as more dangerous globally. This is consistent with an intuitively-appealing theory animating much of the pre-existing literature on primals originally posed by traumatologist Janoff-Bulman (1989) and adopted by several others (Foa & Rothbaum, 1998; Foa, Ehlers, Clark, Tolin, & Orsillo, 1999; Kauffman, 2002; Boelen, van den Hout, & vanden Bout, 2006). This theory holds that traumatic events dramatically increases the belief that the world is dangerous (i.e., low *Safe* scores on the Primals Inventory). Since our (Clifton et al., 2019) identification of several previously unidentified primals, I have observed anecdotally at talks and conferences that similar retrospective intuitions emerge to explain primals' origins. For example, many researchers intuit that privileged racial groups will see the world as more *Just* and *Abundant* than underserved racial groups. What all these retrospective theories and intuitions have in common is the notion that past experiences characterized by *X* quality pushes the individual towards seeing the world as characterized by *X* quality to such an extent that primals reveal not just one's beliefs but also one's demographics.

Interpretive theories posit that, rather than a mirror reflecting one's experiences, a primal

functions as a lens used to interpret experiences while being itself largely uninfluenced by them. For example, an interpretive theory of how the primal *Abundant* relates to personal wealth would predict that being rich (or poor) would have little to no impact on the belief that the world is *Abundant*. Likewise, experiencing dangerous environments or trauma (or safe environments) would have little to no impact on the belief that the world is *Safe*. Though such interpretive theories are reasonable, it's fair to say that they are typically not as intuitively appealing as their retrospective counterparts.

Nevertheless, I hypothesize that interpretive theories are generally more accurate than retrospective theories, though likely with some moderate exceptions such as childhood trauma and chronic pain. My rationale stems from the central point of Janoff-Bulman's (1989) original article, subtitled *Applications of the Schema Construct*, where she suggests that world beliefs likely operate as *schemas*.

Though definitions of *schema* vary (van der Veer, 2000), the paradigm has been central to belief research for decades (e.g., Crum, 2013; Dweck, 2017; Beck, 1963, 1964, 1967, 2005). The term usually refers to pre-existing mental models about an object used to generate expectations, assist interpretation and memory reconstruction, and guide interaction (e.g., Piaget, 1926; Brewer, 2000; Rumelhart, 1980; Nash, 2013; Bernstein, Roy, Skrull, & Wickens, 1991; Janoff-Bulman, 1989). For example, Davis (1991) found that a schema for an *egg* involves at least 45 different modifiers such as *nutritious*, *delicate*, and *laid in nests*.

In addition to introducing the idea of schemas (1926), Piaget theorized how schemas would typically relate to experiences (1971). When facing evidence of a schema violation, Piaget posits two options—accommodation (revising one's schema) or assimilation (reinterpreting the new information to minimize its importance)—and assimilation would be overwhelmingly favored. Decades of research confirms this. When facing schema-inconsistent information, individuals tend to ignore it, reject it, reinterpret it, or adopt other rejection-seeking behavior (e.g., Brewer, 2000; Janoff-Bulman, 1989; Hastie, 1981; Ross, Lepper, & Hubbard, 1975). As schema's influence perceptions, the new information will often serve as "evidence" for the veracity of the

original schema (e.g., Vernon, 1955; Labianca, Gray, & Brass, 2000), thus creating a *self-supporting* feedback loop. In addition to altering percepts directly, a schema's influence on behavior can also lead to actual outcomes that provide further "evidence" of the original schema, creating a *self-fulfilling* feedback cycle (e.g., Labianca, Gray, & Brass, 2000). In these ways, schemas contribute to the phenomenon termed *confirmation bias* (e.g., Nickerson, 1998; Merton, 1948; Jussim, 1986).

Though Janoff-Bulman (1989) acknowledged that "the tendency is towards assimilation rather than accommodation," she thought trauma would be an exception that would reliably and dramatically alter world assumptions, including what we (Clifton et al., 2019) call *primal world beliefs*. Her (1992) book on trauma was entitled *Shattered Assumptions* and her theory is sometimes called *shattered assumptions theory*. Yet Kaler and colleagues (2008) found that in only about a quarter of those recently traumatized was there any reliable change in world beliefs and—moreover—these were equally divided between those coming to see the world as more negatively and those coming to see the world more positively. Indeed, as Mancini, Prati, and Bonnano (2011) note, despite the popularity of shattered assumptions theory, there is little evidence much shattering happens. This is partly due to the absence of control groups, but also the smallness of observed effects which, when it is observed at all, is typically small, even among Holocaust survivors (e.g., Prager & Solomon, 1995). Indeed, if those who experienced first-hand the mass systematic internment, deprivation, torture, and slaughter during the Holocaust—arguably one of the most traumatic events in history—do not see the world as that much worse than those who escaped the experience, then retrospective explanations of how negative primals arise probably has less to offer than intuition suggests.

Yet, as Mancini, Prati, and Bonnano (2011) point out, shattered assumptions theory remains popular among researchers and clinicians—even lay people—likely in part because of its intuitive appeal. Indeed, after encountering similar patterns of retrospective intuitions in connection to newly-identified primals, I have come to suspect several biases are at play, including an actor-observer bias wherein individuals tend to condescendingly imagine that other

people cannot help but believe the things they do because of their backgrounds while our own primal world beliefs stem from something more objective and clear-eyed (Clifton, in press). Others are on a journey; I have arrived.

It may be that, rather than experiences influencing primals in a straightforward way, individuals use past experiences to justify whatever primal they already hold. For example, if one sees the world as a dangerous place and gets into a car accident, perhaps on average he will eventually frame that experience as evidence of what he knew all along. Likewise, if one who sees the world as a safe place and gets into a car accident, perhaps on average she will eventually frame this experience as exceptional, having occurred for local, particular, and temporary reasons. Indeed, because the world is a giant dataset, there is much information that can be garnered in support of any primal. And if primals direct attention and resist assimilation as the schema literature suggests, researchers should expect such garnering to occur, and thus retrospective theories to be generally inaccurate.

Could a theory explaining how experiences relate to primals be both non-retrospective and non-interpretive? Perhaps. However, whereas retrospective theories could be completely false without fundamentally altering current assumptions about primals and their nature, the same is not true of interpretive theories. Fundamental to researcher's (Janoff-Bulman, 1989; Clifton et al., 2019; Clifton & Kim, 2020; Clifton, in press) understanding of primals is the same assumption underlying researcher's conceptions of beliefs generally (e.g., Crum, 2013; Dweck, 2017; Beck, 1963, 1964, 1967, 2005). Namely, that beliefs influence thought and behavior largely via ambiguity interpretation. If primals were found to exert no influence on the interpretation of one's personal experiences, then primals are either (a) exclusively symptoms rather than causes of primals' numerous personality and wellbeing correlates; (b) primals' impact on these outcomes are unmediated by interpretation; or (c) primals do influence the interpretation of some new information but, for some reason, not new personal experiences. Given current research, these options seem unlikely.

Twelve Hypotheses

To determine whether retrospective or interpretive theories are typically more accurate across different primals and different experiences, multiple hypotheses in which each theory makes diverging predictions must be examined. Table 1 specifies twelve hypotheses which were selected according to three criteria.

- The measurability of the relevant life experience
- The involuntariness of the experience (to avoid confounding causal relationships)
- The clarity of alternative retrospective and interpretive predictions

Multiple hypotheses are necessary because some involve disputable assumptions that others do not. For example, perhaps the most dubious assumption underlies hypotheses #4: Is the world really more dangerous for women than men when men are more likely to be killed violently and die on average five years sooner (e.g., Rochelle, Yeung, Bond, & Li, 2015)? Perhaps, but among a variety of threats that disproportionately impact women, it is indisputable that most women spend life surrounded by biologically stronger, faster, more aggressive individuals who are motivated to assault them, often do, and whose denials are traditionally more likely to be believed over women's accusations (e.g., Lassek & Gaulin, 2009). Thus, if researchers were to find that nevertheless women and men see the world as equally *Safe*, that can be considered inconsistent with a retrospective theory of how *Safe* develops, though not compelling unless other hypotheses relying on different assumptions are also examined.

All twelve hypotheses can be determined by interpreting correlational effect sizes, with thresholds for interpretation varying depending on the hypotheses. However, based on commonly-used thresholds (e.g., Cohen, 1992), the threshold of $r>.30$ that Kaler and colleagues (2008) used to examine a retrospective theory, and my own research experience, I suggest the following admittedly arbitrary thresholds for pairwise relationships:

- $r > .30$ can be considered *clearly consistent* with the retrospective prediction and *clearly inconsistent* with the interpretive prediction
- $.295 > r > .20$ can be considered *weakly consistent* with the retrospective prediction and *weakly inconsistent* with the interpretative prediction
- $.195 > r > .10$ can be considered *weakly inconsistent* with the retrospective prediction and *weakly consistent* with the interpretive prediction
- $.095 > r > -.095$ can be considered *clearly inconsistent* with the retrospective prediction and *clearly consistent* with the interpretive prediction.

Because the twelve hypotheses seek to derive conclusions from orthogonality, I would remind the reader that, while correlation does not indicate causation, under certain assumptions orthogonality does suggest causality's absence or trivialness. Of course, researchers should check those assumptions, particularly curvilinearity, possible third variable confounds, indirect pathways, and counterbalancing effects. For example, Mancini, Littleton, and Grills (2016) found that the negative psychological impact of the Virginia Tech shootings was mitigated by the countervailing effects of increased social support which may influence, among other things, beliefs about the world (Mancini, 2019). Nevertheless, if primals do not reflect backgrounds in a straightforward manner as evidenced by bivariate analysis, this would suggest that retrospective theories are inaccurate even if further analysis reveals confounds, indirect pathways, or counterbalancing effects. Retrospective theories are by definition not nuanced in this way.

Previous research sheds light on several of these 12 hypotheses, especially trauma research. For example, converting Prager and Solomon's (1995) results to a Pearson's *r* suggests that that subjects who experienced the Holocaust saw the world as less benevolent at $r(158)=.31$. This is *clearly consistent* with the retrospective prediction and *clearly inconsistent* with the interpretive prediction—but barely so. Using the World Assumptions Scale, Kaler and colleagues (2008) found in a sample of 735 undergraduates that increased lifetime trauma correlated with world benevolence beliefs at $r=-.14$ and recent trauma did not seem to have any impact on these beliefs. Given the severity of the Holocaust compared to, say, getting mugged, could it be that $r=.31$ approximates an upper-limit average trauma effect?

However, because hypotheses concern several primals that only the Primals Inventory measures and because the Primals Inventory is a more nuanced measure of primals (for a detailed discussion see Clifton, in press), it is ideal if all twelve hypotheses are examined using the Primals Inventory. To some extent this too has been done. On pages 310-323 of Clifton and colleagues (2019) supplement is a large correlation matrix showing some pertinent relationships among 524 Americans, ages 18–75 (M=37), who were approximately 50% women and 50% college graduates.

- Concerning Hypothesis #4, women did not see the world as more dangerous than men (r=.01, p>.05)
- Concerning Hypothesis #5, growing up poor did not correlate with seeing the world as less *Abundant* (r=-.07, p>.05)
- Concerning Hypothesis #6, those in families with higher incomes did not see the world as more *Abundant* (r=.05, p>.05).
- Concerning Hypothesis #9, growing up poor did not correlate with seeing the world as less *Pleasurable* (r=-.06, p>.05).
- Concerning Hypothesis #10, high family income did not correlate with seeing the world as more *Pleasurable* (r=.03, p>.05).

These results are, based on above thresholds, clearly inconsistent with retrospective predictions and clearly consistent with interpretive predictions. But these results also come from one sample in which only a preliminary version of the Primals Inventory was used, literally thousands of correlational relationships were examined without correcting for multiple comparisons, above hypotheses were not pre-registered, and most of the twelve hypotheses were not examined. Much remains unclear.

Table 1

Twelve Alternative Retrospective and Interpretive Predictions

	Primal	Experience	Retrospective Prediction	Interpretive Prediction
1	*Safe* (vs. dangerous)	Childhood trauma	Trauma often increases the belief that the world is dangerous. Therefore, increased trauma should correlate substantially with lower *Safe* scores.	The primal *Safe* is used to interpret trauma while being itself little affected by it. Therefore, increased trauma should be marginally related or orthogonal to *Safe* scores.
2		Adulthood trauma		
3		Neighborhood crime rates	Living in dangerous places increases the belief that the world is dangerous. Therefore, living in a more dangerous zip code based on crime statistics should correlate with lower *Safe* scores.	The primal *Safe* is used to interpret dangerous situations while being itself marginally affected by them. Therefore, living in a dangerous zip code should be marginally related or orthogonal to *Safe* scores.
4		Sex	Being physically weaker than many around you—especially people who are motivated to assault people like you, often do, and whose denials are likely to be believed over your accusations—leads to seeing the world as more dangerous. Therefore, being female should correlate with low *Safe* scores.	The primal *Safe* is used to interpret situations in which one is susceptible to dangers while being itself marginally affected by them. Therefore, being female should be marginally related or orthogonal to *Safe* scores.
5	*Abundant* (vs. barren)	Childhood SES	Growing up poor often results in seeing the world as a more barren place with fewer resources and opportunities. Therefore, low childhood socio-economic status (SES) should correlate with low	The primal *Abundant* is used to interpret material circumstances in childhood while being itself marginally affected by such circumstances. Therefore, low childhood SES should be

			Abundant scores.	marginally related or orthogonal to *Abundant* scores.
6		Family income	Being poor often results in seeing the world as a more barren place with fewer resources and opportunities. Therefore, low family income should correlate with low *Abundant* scores.	The primal *Abundant* is used to interpret material circumstances while being itself marginally affected by it. Therefore, low family income should be marginally related or orthogonal to *Abundant* scores.
7		Neighborhood mean income	Living in a poor neighborhood often results in seeing the world as a more barren place with fewer resources and opportunities. Therefore, living in a lower-income neighborhood should correlate with low *Abundant* scores.	The primal *Abundant* is used to interpret material circumstances while being itself marginally affected by it. Therefore, living in a lower-income neighborhood should be marginally related or orthogonal to *Abundant* scores.
8	*Pleasurable* (vs. miserable)	Chronic pain	Being in chronic physical pain often results in seeing the world as a more miserable and uncomfortable place. Therefore, chronic pain exposure should correlate with low *Pleasurable* scores.	The primal *Pleasurable* is used to interpret experiences of pain while being itself marginally affected by it. Therefore, experiencing chronic pain should be marginally related or orthogonal to *Pleasurable* scores.
9		Childhood SES	Higher SES while growing up corresponds with having more frequent and intense pleasurable experiences in childhood, which often results in seeing the world as a more pleasurable place. Therefore, higher childhood SES should correlate with *Pleasurable* scores.	The primal *Pleasurable* is used to interpret pleasurable experiences in childhood while being itself marginally affected by it. Therefore, high childhood socio-economic status should be marginally related or orthogonal to the belief that the world is pleasurable.
10		Family income	Higher family income corresponds with having more frequent and intense pleasurable experiences, which often results in seeing the world as a more pleasurable place. Therefore, higher family income should correlate with *Pleasurable* scores.	The primal *Pleasurable* is used to interpret pleasurable experiences while being itself marginally affected by them. Therefore, family income should be marginally related or orthogonal to *Pleasurable* scores.
11	*Progressing* (vs. declining)	Change in personal SES from childhood to adulthood	Experiencing decline in personal SES often results in seeing the world as declining. Therefore, decline in SES from childhood to adulthood should correlate with lower *Progressing* scores.	The primal *Progressing* is used to interpret decline in SES while being itself marginally affected by it. Therefore, decline in SES from childhood to adulthood should be marginally related or orthogonal to *Pleasurable* scores.
12		Change in neighborhood mean income	Living in a declining neighborhood often results in seeing the world as declining. Therefore, living in an area that is in economic decline should correlate with lower *Progressing* scores.	The primal *Progressing* is used to interpret neighborhood decline while being itself marginally affected by it. Therefore, neighborhood decline should be marginally related or orthogonal to *Progressing* scores.

Where Should Researchers Look Instead?

If researchers find that retrospective theories are generally inaccurate, does that mean that experiences do not shape primals? No. Interpretive theories only presume that primals do not reflect the content of past experiences in a straightforward manner, but experiences come in many shapes and sizes and might influence primals in a variety of less straightforward ways. Where might researchers look next? What experiences should researchers focus on?

These questions are impossible to answer without a reasonably exhaustive framework by which a breadth of human experiences can be considered. After recently introducing the primals construct (Clifton et al, 2019), I asked the same question that many researchers before me have asked: *Which experiences influence (or are influenced by) my construct?* Failing to unearth some sort of comprehensive framework or measurement tool that identifies a broad range of psychologically important human experiences that I could use as a basis for systematic theorizing about experiences in relation to my construct, I created the following Cube Framework. I provide it here to aid other researchers examining other constructs, to highlight areas for further research on the primals construct, and to invite comment before building a more comprehensive experience checklist than is currently available.

Three Dimensions of the Cube Framework

There are three major psychologically salient continuous dimensions by which all experiences vary. For practicality, the Cube Framework simplifies these dimensions into dichotomies. The point is not to know precisely where a particular experience falls on a dimension but for the researcher to have a tool to guard against the consideration of only a narrow slice of human experience.

Chronic-acute

All experiences happen in time. Thus, all experiences can be sorted into more acute experiences that take moments/days/weeks and more chronic experiences that take months/years/decades. Previous experiences checklists have generally ignored chronic life

experiences, such as having a chronic illness or negative boss. However, demographic information is often important precisely because it captures chronic experiences, such as being male or poor.

Internal-external

All experiences are to varying degrees under the individual's control. Several literatures draw attention to the psychological importance of this distinction including learned helplessness, attribution theory, optimism/explanatory style, personality, locus of control, and incremental theory (Abramson, Seligman, & Teasdale, 1978; Harvey et al., 2014; Peterson & Seligman, 1984; Lewin, 1936; Rotter, 1966; Blackwell, Trzesniewski, & Dweck, 2007). Though many experiences, such as going to college, can be either internally driven or more externally imposed, many experiences can be fairly readily categorized as more often one or the other. A death in the family or inheriting a fortune, for example, are experiences that are usually externally imposed.

Positive-negative

All experiences vary by subjective desirability (good, neutral, or bad). Though most difficult to measure objectively, this dimension is also the most psychologically impactful. There is a massive gulf, after all, between a good childhood and a bad childhood, a good sex life and a bad sex life, and so forth. However, like the internal-external dimension, exactly where any given experience falls on the positive-negative dimension may be up for debate. Nevertheless, many experiences will be readily characterizable. Death and injury, for example, can be thought of as negative. Receiving a promotion or falling in love can be considered positive.

Eight Experience Types in the Cube Framework

The permutations of these three dimensions reveals eight types of human experience (Figure 2).

Bad choices

Acute, internally-driven, negative experiences—*bad choices*—may include losing one's savings in a poor investment, stealing, cheating, sexually assaulting someone, sleeping with a friend's spouse, deciding to drive home drunk, or joining a cult.

Bad habits

Chronic, internally-driven, negative experiences—*bad habits*—may include a gambling habit, smoking, pessimism, distrust, overeating, overspending, continually returning to an abusive partner, or staying in a cult.

Bad luck

Acute, externally-imposed, negative experiences—*bad luck*—may include natural disasters, car accidents, stroke, fire, and sudden deaths in the family. The large majority of experiences mentioned by the Social Readjustment Rating Scale (Holmes & Rahe, 1967) and the Life Experiences Survey (Sarason, Johnson, & Siegel, 1978) consists of such *bad luck* experiences. Studying them is clearly worthwhile, but they represent only a narrow slice of life.

Bad times

Chronic, externally-imposed, negative experiences—*bad times*—may include being raised by a negative parent, growing up receiving person praise rather than process praise (Kamins & Dweck, 1999); coping with chronic pain, being unemployed, having an unkind boss, involuntarily fighting in a war, or living in a society prejudiced against your gender or race.

Good choices

Acute, internally-driven, positive experiences—*good choices*—may include falling in love, identifying your mission in life, taking a backpacking trip across Europe, or converting to a religion.

Good habits

Chronic, internally-driven, positive experiences—*good habits*—may include staying physically active, mastering a skill, engaging in some life-giving activity like ballroom dancing or playing in the local philharmonic, chronically believing the best about others, being an avid reader, gardening, spending time outdoors, being in a committed relationship, being an avid traveler, taking care of a dog, volunteering for charity, or raising children.

Good luck

Acute, externally-imposed, positive experiences—*good luck*—may include inheriting a

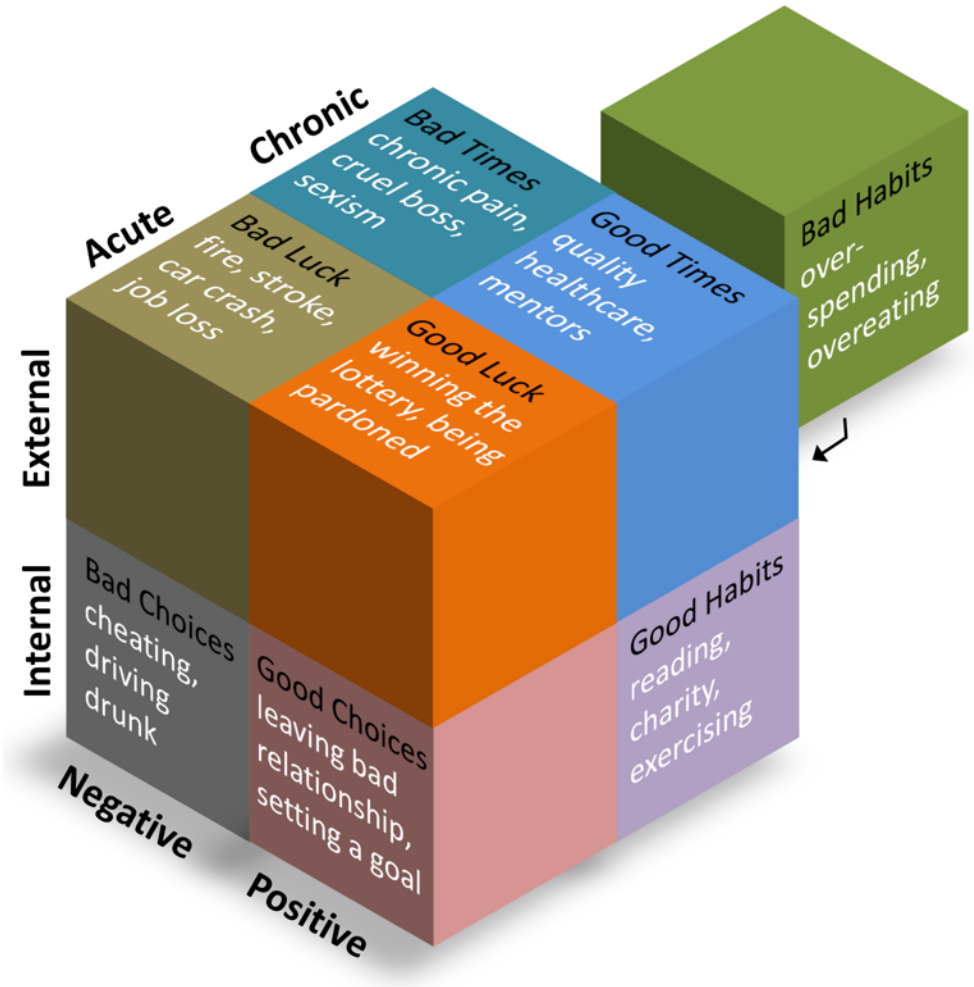
fortune, winning the lottery, getting adopted, being recruited for a job, being granted a pardon, or receiving a voucher to go to a better school.

Good times

Chronic, externally-imposed, positive experiences—*good times*—may include living in a peaceful society, being raised by a highly supportive parent, receiving a four-year liberal arts education, enjoying sustained access to medical care, or being mentored by a teacher.

Figure 2

The Cube Framework Uses Three Dimensions to Define Eight Experience Types



Suggestions for Applying the Cube Framework

Instead of listing out all human experiences, the Cube Framework provides a method that researchers can use to systematically theorize about a diversity of experiences. I suggest using it

in two ways. First, the researcher can ask themselves eight questions about each experience type. For example, *What good choices might influence or be influenced by my construct?* Yet examining experiences by only type risks the Cube Framework becoming a filter such that only experiences that fit neatly within each type are considered. Addiction, depression, and obesity, for example, are clearly chronic and negative (and important to study) but less clearly categorized along the internal-external dimension, and thus may not emerge from eight questions about the eight types. Therefore, second, I suggest that psychologists also theorize by dimension, one dimension at a time. For example, when considering the acute-chronic dimension I might ask myself: *What experiences that relate my construct might happen in a moment...in an hour…in a day…in a week, in a month…in a year…in a decade…or last a lifetime?* Using both by-type and by-dimension approaches ensures that a diversity of experiences are considered.

The Cube Framework allows flexibility because it is able to incorporate any additional fourth dimension the researcher might deem important. For example, there is arguably at least one other psychologically-important dimension on which all experiences vary that the Cube Framework does not incorporate: the age at which an experience occurs in the life of the person. The Cube Framework does not include this dimension because I found adding it led to the identification of relatively few novel hypotheses, lowered the utility of the framework by complicating it, and, most importantly, age is a characteristic of the person rather than the experience. However, if a researcher wishes to ensure diversity along this or any other fourth dimension, researchers can consider not one cube but two cubes, with each cube labeled according to the fourth dimension, such as *Childhood Experiences* and *Adulthood Experiences*. Then the researcher can consider *childhood bad times* separately from *adulthood bad times, childhood good choices* separately from *adulthood good choices*, and so forth.

Applying the Cube Framework to Primals Research

With the big exception of research over the last two decades in positive psychology, psychologists have historically focused on acute, externally-imposed, negative (i.e., *bad luck*) experiences like trauma and neglected experiences that last longer, are internally-driven, and

positive. Thus, when considering which experiences might influence primals, positive and chronic experiences (*good times* and *good habits*), such as having a highly-supportive parent or teacher, might be worth further examination. Positive acute experiences, such as powerful moments of transcendence, are also promising.

Furthermore, if retrospective theories are typically inaccurate—if exposure to *X* quality typically has no impact on ways of thinking about the world generally—then perhaps exposure to alternative ways of thinking about *X* quality is what matters. This exposure might occasionally be self-driven by the philosophically adventurous but more typically result from personal social interactions with mentors, friends, colleagues, therapists, parents, or others who see the world differently. Exposure may also occur through storytelling via, for example, movies and novels. For example, a premise of the 2003 and 1999 hit films *Love Actually* and *American Beauty* is that love and beauty are everywhere, even in the midst of pain and suffering—even perversion. Be it via real-life encounters or fictional stories, encounters with alternative lenses on reality may sometimes result in one coming to prefer them. Informal social pressures may also be at work. For example, one primals research study awaiting duplication indicates that students are more likely than the general public to see the world as dangerous. Is this because the student context is a particularly dangerous one—the retrospective explanation? Likely not. Instead, perhaps the task itself or particular subcultures implicitly encourage—teach—this primal through a variety of formal and informal incentives and social mechanisms. If exposure to different lenses on reality impacts which lenses individuals choose for themselves, perhaps researchers will find that one experience that often impacts primal world beliefs is the simple act of taking the Primals Inventory, learning what primals one holds, and discovering one has options.

Concluding Remarks

In this chapter I have asked the typical question a researcher asks after introducing a construct: *Which experiences influence (or are influenced by) my construct?* In the case of primals, I discussed two broad possibilities. The first holds that primals generally reflect our backgrounds in a fairly straightforward manner (retrospective theories). The second suggests that

primals are used to interpret experiences while being themselves marginally influenced by them (interpretive theories). This chapter then specified twelve empirical tests to shed light on which approach is typically more accurate, which I hypothesize will most often be interpretive theories despite having less intuitive appeal and running counter to some existing theory. If future empirical research confirms this, researchers will have to look elsewhere to determine which experiences might impact primals. To facilitate that search, I have provided the Cube Framework as a tool for methodically considering a range of human experiences and generating hypotheses. My own use of it suggests that a promising place to look will be chronic and positive experiences, such as having a supportive and esteemed parent or mentor who implicitly or explicitly encourages certain primals, as well as acute and positive experiences, such as transcendent experiences.

In closing, however, I confess some pessimism. It may be that few naturally-occurring life experiences reliably influence primals. Perhaps primals typically emerge early in life for idiosyncratic reasons in a process non-deterministically yet strongly impacted by genetics. Primals could then perpetuate themselves through mechanisms associated with schemas. This would not mean, however, that primals cannot be changed by experiences, just that they generally are not. Researchers already know that beliefs very similar to primals can be reliably altered through Cognitive Behavioral Therapy (e.g., Beck, 2005). Thus, even if experiences that influence primals cannot be found, perhaps they can be designed.

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CHAPTER 3 - THE VALUE OF SEEING THE WORLD AS A BAD PLACE: A CROSS-SECTIONAL SEARCH FOR UNICORNS

Abstract

Preliminary studies suggest that negative primal world beliefs, which are basic beliefs about the world's typical character such as *the world is dangerous* and *the world is barren*, are strongly correlated with lower wellbeing. Theory suggests that some covariance is likely explained by primals shaping wellbeing. Thus, a critical next step is manipulating primals to test causality. Future interventions may fail to successfully alter primals, however, without addressing certain meta-beliefs—beliefs about beliefs—that likely bolster negative primals. This chapter examines *prospective* meta-beliefs, which are assumptions that a negative primal offers a means for achieving future goals, such as *seeing the world as dangerous keeps people safe*. Study 1 (*N*=180) establishes prevalence for such prospective meta-beliefs by showing that many parents aim to teach negative primals to their children. I then search within six samples representing 48 occupation groups (Study 2, *N*=4,535) for contexts where, on average, such meta-beliefs hold true, at least concerning job success, job satisfaction, negative emotions, depression, suicide, physical health, life satisfaction, and psychological flourishing. This search finds six instances in which a negative primal correlated with positive outcomes—each involving small sub-samples and modest effect sizes—and 1,854 instances in which negative primals correlated with negative outcomes—many in sizeable samples with large effect sizes. This pattern suggests that many prospective meta-beliefs are false, which could be incorporated into interventions designed to undermine these prospective meta-beliefs and the negative primals they presumably support. This chapter also helps establish the direction and size of correlational relationships between primals and important clinical and wellbeing outcomes, which is useful for theory-building and identifying promising areas for future research.

I always think everything could be a trap—which is why I'm still alive.

—Prince Humperdink, *The Princess Bride*, 1987

Introduction

Clifton and colleagues (2019) recently discovered that humans disagree about the world's most basic qualities along many more dimensions than previously realized—26 in total, including the belief that the world is beautiful, dangerous, just, interconnected, and even funny. Calling these beliefs *primals* or *primal world beliefs*, they found that most primals group into three main beliefs—informally called the 'big three'—the beliefs that the world is *Safe* (vs. dangerous), *Enticing* (vs. dull), and *Alive* (vs. mechanistic), which in turn group into the general factor, the overall belief that the world is a *Good* place. Each belief is statistically distinct, stable across time, and largely orthogonal to demographic variables, as well as highly correlated to many personality and wellbeing variables.

However, the claim about wellbeing correlates comes with an asterisk. Prior to Clifton and colleagues' (2019) work, only one primal—*Just*, often called BJW or Belief in a Just World—had received broad research attention, which established that *Just* has many wellbeing-related correlates (Bartholomaeus & Strelan, 2019). Those high in belief in a just world tend to be more successful and productive, presumably because of the expectation that hard work will be rewarded, with high *Just* scores being tied to everything from better grades to higher GDP (Dalbert & Stoeber, 2005; Furnham, 1993). Those high in belief in a just world also enjoy much higher wellbeing. For example, Dzuka and Dalbert (2006) found that senior citizens of East Slovakia enjoyed much higher life satisfaction when they also saw the world as just ($r(122)=.45$, $p< .001$) and this relationship is even stronger in the general adult population (e.g., $r(422)=.57$, $r(80)=.67$, $r(80)=.54$, $p<.01$; Otto, Glaser, & Dalbert, 2009).

However, prior to Clifton and colleagues (2019) work, most primals remained unidentified and, so far, only two studies have used the 99-item Primals Inventory—currently the only comprehensive measure of primals—to examine primals' wellbeing correlates. In Clifton and

colleagues' (2019) foundational paper validating the Primals Inventory, one study of 524 mTurkers completed a preliminary 94-item version to examine correlations between primals and health, negative emotion, depression, life satisfaction, and psychological flourishing, with most results undiscussed and buried in a 507-page supplement. In the other study *(N*=404), Stahlmann and colleagues' (2020) examined primals relationship to life satisfaction in the course of validating a German 66-item version of the Primals Inventory. Both studies unearthed moderate to large relationships between primals and wellbeing that are worth replicating and warrant discussion.

Moreover, researchers note that, consistent with current depression theory, schema theory, personality theory and the success of established interventions such as Cognitive Behavioral Therapy, considerable covariation between primals and wellbeing is likely to be explained by primals influencing wellbeing correlates (Clifton et al., 2019; Stahlmann et al., 2020; Beck, 1964, 2005; Janoff-Bulman, 1989; Dweck, 2008, 2017; Butler et al., 2006; Hofmann et al., 2012). Considerable covariance, however, might also be explained by the primal being an indicator of the outcome variable, not a cause. For example, seeing the world as a barren place could lead to depression or be a symptom of depression. To resolve this issue, experimentation is necessary, which will require interventions capable of altering primal world beliefs—perhaps a tall order, given how fundamental primals appear to be.

One step towards designing effective interventions may be addressing two types of meta-beliefs (i.e., beliefs about beliefs) that bolster negative primals. *Retrospective meta-beliefs* suppose that one has little choice but to hold a primal because certain experiences are thought to irrevocably shape the individual's identity (i.e., a causality claim) and most individuals who have the experience share a similar identity (i.e., a probability claim). For example, a primals study subject has commented, "I know many of my opinions [primals] are biased due to growing up and currently being very poor. It has colored my perception of the world and I know of no way to change that." In this view, it is presumed that others with similar backgrounds often share the same primals.

While retrospective meta-beliefs concern the past, *prospective meta-beliefs* concern future utility. During seven years studying primals, I have encountered many prospective meta-beliefs that connect negative primals to positive outcomes. Six of the perhaps more common are listed in Table 2. They associate negative primals with being happier, healthier, more successful, more knowledgeable, more respected, and more helpful to society. Like retrospective meta-beliefs, prospective meta-beliefs often involve causal and probabilistic components (e.g., "my negative primals help me do better at my job" versus "people with more negative primals are usually better in my job"). Since these outcomes are measurable, both components are testable, and the probabilistic components readily testable via correlational research.

Table 2

Six Prospective Meta-Beliefs Purporting the Utility of Negative Primals

Relevant outcome	Anecdotal sources	Paraphrased meta-belief
Job success	Police officer, lawyer, businessperson	*While positive primals might make me feel better, it's a luxury I can't afford because people usually don't succeed in my job without a darker view of things.*
Negative emotions (job and life satisfaction, and suicidal behavior)	Police officer, parent, car mechanic, student	*More often than not, seeing the world as this amazing place leads to disappointment with what you get, both at work and home, which can make you depressed, lose hope, and even get suicidal—best keep expectations low.*
Physical health	Police officer, healthcare worker, soldier, Prince Humperdink (quoted above)	*Seeing the world as safe where everyone sings 'Kumbaya' leaves people vulnerable to predation, physical threat, germs, illness, and even death—you gotta stay vigilant.*
Perception accuracy	Many individuals holding negative primals	*Indulging a fantasy rarely helps anyone to achieve their goals, whatever the goal might be, and the belief that the world is this wonderful place is a fantasy.*
Reputation costs	Intellectual, activist, politician, social worker, literary critic	*When people see the world as positive, they're judged as naïve, insensitive to the struggles of those less fortunate, and a poor example to others.*
Group goals	Environmentalist, religious missionary, senator, social worker	*The world has lots of terrible problems, from the environment to social justice. People who think the world is already good-to-go don't work as hard to make things better—you can't solve a problem without recognizing it.*

After checking if, beyond anecdotal evidence, such meta-beliefs are in fact common (Study 1), this chapter scours six samples representing 48 occupation groups (Study 2; *N*=4,535) for instances in which more negative primals were associated with any of eight positive

outcomes, thereby testing the probabilistic components of several of these prospective meta-beliefs. The eight outcomes touch on the first three prospective meta-beliefs in Table 2 and are as follows: job success, job satisfaction, negative emotion, depression, suicide, physical health, life satisfaction, and overall psychological flourishing. In conducting this research, Study 2 also contributes to the literature by more firmly establishing the size and direction of correlational relationships between primals and wellbeing-related variables.

Study 1: Does Anyone Actually Associate Negative Primals With Positive Outcomes?

Is it really true that a non-trivial portion of the population believes that negative primals are more helpful than positive primals? To explore this, asking adults about the general utility of their own primals was not ideal to due a concern that responses might be confounded by retrospective meta-beliefs. Furthermore, disadvantaged minorities may be more likely to see value in negative primals because the world is often more against them compared to other groups. Therefore, on the assumption that parents want what is best for their children's future, I asked New York City minority parents to complete an adapted version of the Primals Inventory designed to measure which primals they wished to teach their children. I pre-registered hypotheses on the Open Science Framework before analyses were conducted.

Sample

Minority parents living in inner city New York neighborhoods were recruited via a popular minority youth advancement program in which their children had been enrolled. Of 185 subjects (M_{age}=47 years, SD_{age}=8), 84 described themselves as black, 52 as Hispanic, 17 as white, and the rest as mixed or other. Most were mothers (79%), Democrats (67%), and some form of Christian (64%). Median annual family income was $80,000.

Measure

Described above, Clifton and colleagues' (2019) Primals Inventory (PI-99) is currently the most valid measure of primal world beliefs (Clifton, in press-b). However, to measure prospective meta-beliefs about primals rather than primals themselves, the PI-99 had to be adapted to

measure opinions about which primals' offer the most utility for their children. Thus, PI-99 scale instructions were edited as follows:

> ~~Below are very general statements about the world~~ *Parents have the privilege and responsibility of preparing their children to navigate the real world*—not the world we wish we lived in, but the actual world as it is now. *Each statement listed below begins with the phrase "I help my kids when I teach them that..." Please indicate the extent to which you agree with each phrase.* ~~Please share your sense of agreement or disagreement. When in doubt, go with what initially feels true of the real world. There are no wrong answers. There's no need to overthink.~~

The stem "I help my kid(s) when I teach them..." then appeared in large bold font every five items, with items minimally edited to be grammatically correct. In nearly all cases, this merely involved the insertion of "…that" before items. For example, "*...that, o*~~O~~n the whole, the world is a safe place." For the sake of brevity, only select subscales were included. These involved (a) negative primals hypothesized as most likely to be worth teaching children; (b) subscales representative of other groups of subscales; and (c) a few other subscales that may be interesting for sample-specific reasons. Thus, I administered 49 items (19 reverse-scored) that allowed me to compute scores on twelve meta-beliefs concerning the belief that the world is *Safe* (29 items), *Pleasurable* (5 items), *Regenerative* (4 items), *Progressing* (4 items), *Harmless* (5 items), *Cooperative* (4 items), *Stable* (4 items), and *Just* (5 items), *Abundant* (4 items), *Funny* (4 items), *Hierarchical* (5 items), and *Improvable* (5 items).

Analysis

Because this adaptation of the Primals Inventory was novel, I conducted a reliability analysis of each subscale before hypotheses were examined, removing items whose inclusion lowered internal reliability more than α=.01. This resulted in removing one item each from *Cooperative*, *Stable*, *Just*, *Abundant*, *Funny*, *Hierarchical*, and *Improvable*. Reliability for *Regenerative* was considered too low (α=.50) to justify further examination and was jettisoned. I then examined descriptive statistics and standard error of the mean. For the sake of this analysis,

having a score <2.5 was considered as believing in the utility of a negative primal and having a score <4 was considered as believing in the utility of avoiding a distinctly positive primal. My pre-registered hypothesis was that, for *Safe* and its seven associated tertiary primals, the portion of the population with scores <2.5 would not be *insubstantial* (defined as <9.45%) but either *meaningful* (between 9.45% and 19.45%), *substantial* (between 19.45% and 29.45%), *major* (between 29.45% and 50%), or *a majority* (>50%).

Table 3

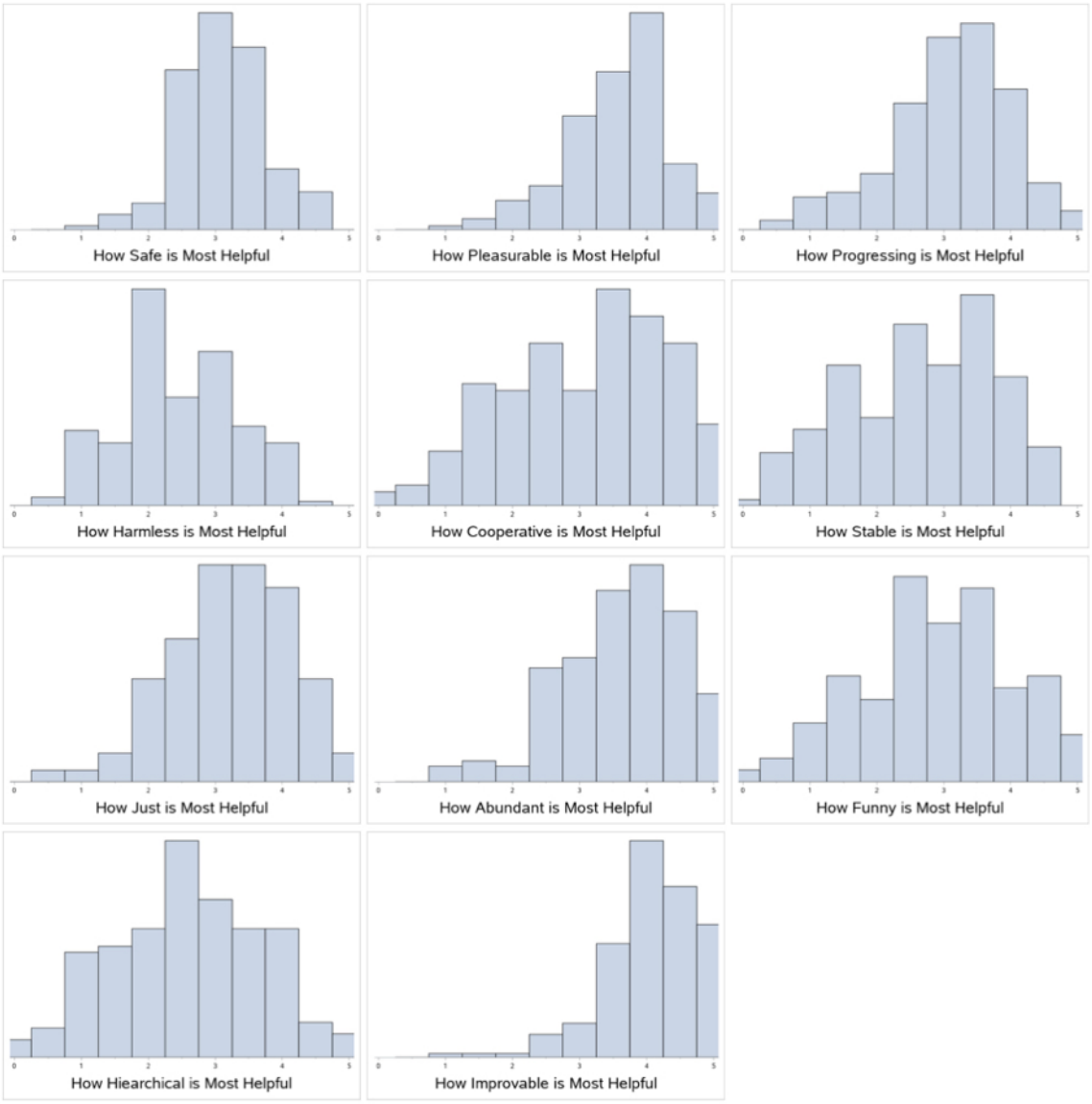
Descriptive Statistics for Eleven Meta-Beliefs Among 185 New York City Minority Parents

Belief in the helpfulness of seeing the world as…	*M*	*SD*	*SEM*	*Median*	*% <2.5* (interpretation)	*% <4*	*Kurtosis*	*α*
Safe (vs. dangerous)	3.10	.62	.05	3.07	14% (meaningful)	92%	.27	.89
Pleasurable (vs. miserable)	3.57	.75	.06	3.60	7% (insubstantial)	64%	.56	.69
Progressing (vs. declining)	2.99	.91	.07	3.00	21% (substantial)	85%	.29	.73
Harmless (vs. threatening)	2.44	.87	.06	2.40	53% (majority)	94%	-.62	.69
Cooperative (vs. competitive)	3.11	1.21	.09	3.33	32% (major)	65%	-.68	.81
Stable (vs. fragile)	2.66	1.10	.08	2.67	41% (major)	83%	-.8	.76
Just (vs. unjust)	3.11	.89	.07	3.25	19% (meaningful)	79%	.13	.64
Abundant (vs. barren)	3.64	.89	.07	3.67	11% (meaningful)	50%	.15	.73
Funny (vs. not funny)	2.90	1.14	.08	3.00	36% (major)	77%	-.49	.83
Hierarchical (vs. nonhierarchical)	2.46	1.12	.08	2.50	49% (major)	88%	-.59	.76
Improvable (vs. too hard to improve)	3.97	.72	.05	4.00	2% (insubstantial)	39%	1.55	.70

Note. Possible range on meta-belief scores was 0-5. SEM refers to standard error of the mean.

Figure 3

The Primal World Beliefs that 185 Parents Considered Most Helpful to Their Children



Results

Many parents believed that instilling negative primals in their children is the best way to prepare their children to navigate life, though to different extents depending on the primal (see Table 3 and Figure 3). Based on pre-registered thresholds, an *insubstantial* proportion of parents thought that seeing the world as too hard to improve (2%) or miserable (7%) would most benefit their children. However, *meaningful*, *substantial*, *major*, and *a majority* proportions of parents, ranging from 11% to 53%, expressed the belief that their children would most benefit by being taught to see the world as dangerous, declining, competitive, fragile, unjust, barren, not funny,

and full of physical threats. Furthermore, in all but one instance, a large majority of parents thought that seeing the world as distinctly positive was not ideal, even among only those who saw more value in the positive primal. For example, 92% of parents thought that seeing the world as safe to very safe (i.e., scores of 4-5 on a 0-5 scale) would be best for their children and 85% held that a strong belief that the world is getting better should be avoided.

Discussion

Meta-beliefs purporting the utility of negative primals cannot be a major driver of negative primals unless such meta-beliefs are to some degree prevalent in the population. Based on the assumption that parents strongly want their kids to achieve success and wellbeing, Study 1 sought to examine prevalence of theoretically promising primals in a theoretically promising population. This was done by asking 180 New York City ethnic-minority parents what primal world beliefs they most want to instill in their children. Strongly left-skewed score distributions would have suggested near consensus that more positive primal world beliefs offer more utility, and vice versa for right-skewed distributions. What was found, however, was normal distributions, suggesting disagreement among subjects, with two points worth highlighting.

First, as hypothesized, a substantial number of parents reported a belief that the best way to prepare children to navigate life was to teach them that the world is in various ways a bad place: including that that the world is full of physical threats; does not reward or punish fairly; is rarely that funny; is full of fragile situations that could easily fall apart; is cut-throat; and is getting worse. Second, putting aside parents who see negative primals as most helpful and focusing only on parents in the right side of the distributions, fewer parents considered distinctly positive primals as offering more utility than slightly positive primals. If this result is minimally generalizable, this indicates a common conception that seeing the world as slightly good supports positive outcomes, but seeing the world as distinctively good is *too good* because very positive beliefs are actually associated with less desirable outcomes. Could that be true? This question is explored in Study 2.

Study 2: Establishing Primals' Success and Wellbeing Correlates

Study 1 results suggest that a portion of the population believe (a) that negative primals correspond with achieving success and wellbeing and (b) that distinctly positive primals correspond with less success and wellbeing than slightly positive primals. Study 2 examines data from six samples and occupational contexts to determine the plausibility of these two meta-beliefs when it comes to eight outcomes: job success, job satisfaction, physical health, negative emotions, depression, attempted suicide, life satisfaction, and psychological flourishing. A secondary aim was to build on the initial findings of Clifton and colleagues (2019) and Stallman and colleagues (2020) to better establish where primals fit within the nomological net. I pre-registered the study on the Open Science Framework before two of the six samples were collected and all analyses conducted. See Table 9 and 10 in appendix for descriptive statistics.

Samples

Sample 1: AH.Org

AuthenticHappiness.Org is a wellbeing-focused website where the general public can voluntarily participate in self-report survey research and receive scores on completed measures. From May 20th, 2019 to March 23rd, 2020, a primals measure was taken 5,316 times with 3,925 unique user-IDs involving no missing responses on relevant subscales. Of these, 59% were male, 66% were younger than 45, and 63% were college graduates. Though respondents were in 92 countries, 68% were in the USA; 5% in Australia; 4% each in the U.K., India, and Canada; 2% in South Africa; 1% in the Philippines; and <1% in each remaining country. Subjects identified themselves with one of 65 possible occupations which were aggregated into 10 occupation groups. Of these 3,925 subjects, 1,072 completed the life satisfaction measure, doing so on average 5.2 months from when they completed the primals measure; 1,118 completed measures of physical health, negative emotion, and psychological flourishing, doing so on average 1.6 months from when they completed the primals measure; and 1,291 completed the depression measure, doing so on average 3.6 months from when they completed the primals measure.

Subsample demographic composition was not notably different than the parent sample. No subjects provided information on job success, job satisfaction, or attempted suicide.

Sample 2: YM.Org

YourMorals.Org is another website where the general public can voluntarily participate in self-report research surveys and receive scores on the measures they complete. But instead of wellbeing research, most studies concern political topics. From November, 2018 to August, 2019, 2,331 people completed the primals measure with 1,727 having no missing responses. Of these subjects (M_{age}=34 years, SD_{age}=14), 69% were male and 72% reported being in or completing college. The respondents were spread across 56 countries, with 74% were in the United States; 7% in Canada; 5% in the U.K.; 4% in Australia; 1% in New Zealand; and <1% in each remaining country. Subjects identified themselves with one of 59 possible occupations which were aggregated into 18 occupation groups. Of 1,843 subjects, 1,639 completed a measure of socio-economic status which could be used as a proxy for professional success and 328 completed the satisfaction with life measure. A small portion of subjects did not complete measures concurrently. Subsample demographic composition was not notably different than parent sample. No subjects in this sample completed measures of job satisfaction, physical health, negative emotions, depression, attempted suicide, or psychological flourishing.

Sample 3: mTurk

Of 882 American mTurkers who completed a lengthy survey, 192 were excluded for failing two or more of five validation items, leaving 692 (M_{age}=36 years, SD_{age}=11). Of these, 56% were male, 49% married, 61% were college graduates, 72% work full-time, and 68% were white. This sample completed a personal income question which was used as a proxy for job success among those with full-time jobs, as well as measures of physical health, negative emotion, depression, life satisfaction, and psychological flourishing. No subjects completed measures of job satisfaction or attempted suicide.

Sample 4: Immigrants

American immigrants from India (47 subjects), West Africa (45 subjects), and South Korea (53 subjects) were recruited January, 2018 to April, 2019 to take the survey for $5 Amazon gift cards. Subjects were recruited via (a) flyers around the University of Pennsylvania campus; (b) social media networks of three undergraduate student researchers who were themselves 2nd generation immigrants; and (c) student groups (e.g., Penn's African Student Association) in the greater Philadelphia area. Initial analysis showed primals subscales to be unusually unreliable (compared to reliability coefficients reported by Clifton et al., 2019) presumably because of reported English disfluency or the need for cultural adaptation of the measurement instrument. Therefore, prior to any further analysis of results, I examined whether one or more of the three subgroups were driving the unreliability, determined it was the Indian group which, when removed, left 98 subjects, and subscale reliability rose to typical levels. Of remaining subjects, all were non-white, 71% were 2nd generation (primarily college age) and 72% were female. This sample completed measures of negative emotion, satisfaction with life, and psychological flourishing. No subjects provided information on job success, job satisfaction, depression, or attempted suicide.

Sample 5: Philly Pros

A sample of Philadelphia-area professionals including lawyers (private practice), car salespersons, and police officers were recruited from January 2018 to March 2019. Because car salespersons proved especially difficult to recruit, they were offered a 5$ Amazon gift card for their participation. Of 120 completed surveys across occupational groups, 10 were excluded for failing more than one attention check, leaving 110 (M_{age}=47 years, SD_{age}=13) who were 67% married, 73% male, and 88% white. Subjects provided detailed information on job success and also completed measures of job satisfaction, physical health, negative emotion, attempted suicide, satisfaction with life, and psychological flourishing, though not a depression inventory.

Sample 6: Undergrads

A sample of 497 undergraduate college students at the University of Pennsylvania completed the survey for course credit in the Spring of 2018. Of these, 24 were removed for

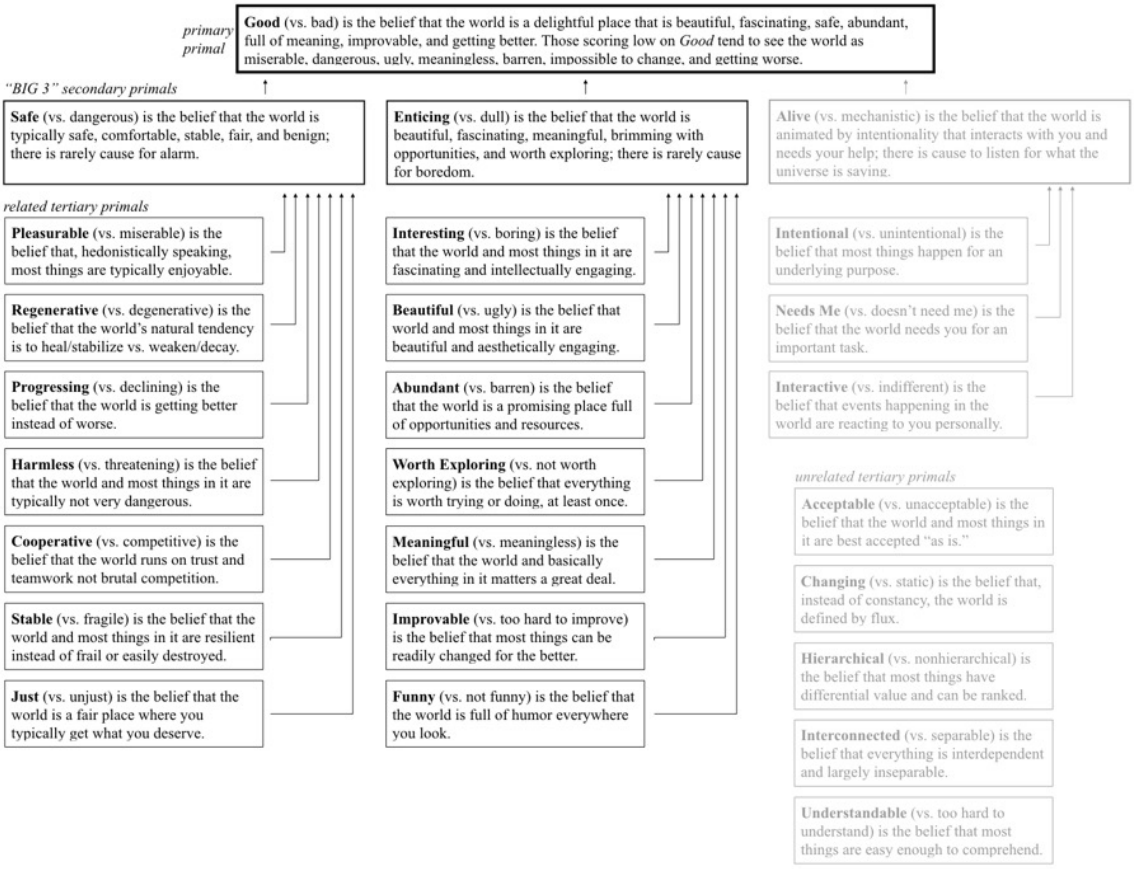
failing more than one attention check, leaving 473 (M_{age}=20 years, SD_{age}=1). Of these students, 27% were freshmen, 33% were sophomores, 23% were juniors, 17% seniors, 74% were female, and 48% were white. They provided information on all eight outcomes.

Seventeen Valenced Primals

The Primals Inventory (PI-99) consists of 99 items, 39 of which are reverse-scored. The PI-99 resulted from Clifton and colleagues' (2019) broad-based effort to empirically derive all major primals humans hold. For example, one of ten projects aiming to capture candidate primals involved the analysis of over 80,000 tweets beginning with the phrases "the world is," "the universe is," and "life is." Another project involved the analysis of over 1,700 instances of world description gleaned primarily from sources that experts considered to be the 385 historically most influential sacred texts, philosophical treatises, novels, political speeches, and films. These projects led to the identification of 234 items subjected to three rounds of factor analysis (N = 930, N = 524, N = 529) which identified the 26 temporally-stable, normally-distributed, meaningful, reliable dimensions in the form of one primary primal (i.e., the belief the world is *Good*), three secondary primals (the beliefs that the world is *Safe*, *Enticing*, and *Alive*), and 22 tertiary primals. Pertinent to Study 2, however, were only those primals with clear valence. *Changing*, for example, cannot be considered negative or positive for conceptual and empirical reasons. Based primarily on empirical relationships with *Good*, I prioritized the 17 primals highlighted in Figure 4. These include *Good*; *Safe* and its seven associated tertiary primals; and *Enticing* and its seven associated tertiary primals. Thus, data on 9 primals were not analyzed.

Figure 4

Seventeen Primals With the Clearest Valence



Note. Figure adapted from Clifton and Kim (2020)

Study 2a: Job Success

Measures

YourMorals.Org subjects (Sample 2; *n*=1,639) reported working in 27 professional contexts (18 sub-samples and 9 sub-sub-samples where *n*≥30), as follows:

- Educators, including teachers and administrators at all levels (*n*=136); sub-sub-sample of pre-college teachers (*n*=62) and college professors (*n*=32)
- Sales and communications (*n*=46)
- Business, including entrepreneurs, owners, executives, managers, and consultants (*n*=128); sub-sub-sample of mangers/executives (*n*=46) and small business owners/entrepreneurs (*n*=34)
- Clerical, including secretaries and administrative office workers (*n*=47)
- Creative arts, such as design, fashion, filmmaker, musician, photographer (*n*=69); sub-sub-sample not including designers or fashion (*n*=54).
- Customer service (*n*=73); sub-sub-sample of hospitality workers (*n*=38) and non-food service cashier (*n*=30)

- Engineer, not including information technology (*n*=57)
- Food service (*n*=46)
- Government (*n*=35)
- Healthcare, including doctors, nurses, dentists, etc. (*n*=70)
- Lawyers (*n*=33)
- Manual labor, such as construction (*n*=83)
- Military/public safety (*n*=35)
- Researcher/analyst (*n*=74)
- Student (*n*=227)
- Technology (*n*=166); sub-sub-samples of programmers (*n*=116) and other (*n*=50)
- Miscellaneous, including farmer, finance, insurance, and journalist (*n*=248)
- Unemployed (*n*=66)

Across these occupational contexts, success was measured using a single item with 10 response options asking subjects to rank themselves compared to others in their country in regard to income, education, and respect. Job success among Sample 3: mTurk subjects who were full-time workers making $10,000 or more annually (*N*=476) was measured by personal income, another proxy for success. Sample 5: Philadelphia Professionals and Sample 6: Undergraduates offered more precision due to several job-specific success indicators administered on the recommendation of members of each occupation:

- Car salesperson success was determined by cars sold per month, monthly closing ratio, monthly commission, dealership rank, and salary
- Private-sector lawyer success was determined solely by current salary
- Police officer success was determined by annual community compliments, community complaints, special assignments, and salary
- Student success was determined by High School and College GPA, standardized test scores (SAT), and quality and quantity of relationships with friends and teachers.

Undergraduate relationships with friends (α=.87) and teachers (α=.87) was measured by two subscales from Pascarella and Terenzini's (1980) Student Involvement Questionnaire. Example items include *It has been difficult for me to meet and make friends with other students* (reverse-scored) and *Since coming to this university I have developed a close, personal relationship with at least one faculty member*.

Analysis

Across samples and within each profession where $n \geq 30$, I examined pairwise Pearson correlations (*r*s) to determine when decreases in primals scores (i.e., more negative beliefs) might be associated with more job success. Because personal income was skewed in Sample 3, I

computed Kendall's τ b (a non-parametric test) and then converted it to Pearson's *r* for cross-sample comparison. For Sample 5: Philly Professionals, I partialed age and years spent practicing the profession (this data was not available for other samples), which would presumably control for generation-related or seniority effects. To determine whether seeing the world as slightly positive vs. distinctly positive was associated with greater job success, I conducted t-tests comparing those who on average selected the *Slightly Agree* response option indicating the belief that the world is positive (PI-99 scores rounded to 3) to those who on average selected *Agree* or *Strongly Agree* (PI-99 scores rounded to 4 or 5), doing so when $n \geq 30$ in both groups. Due to low power relatively fewer extreme scores, subjects averaging 4 were not compared to those averaging 5 and t-tests were not conducted within occupationally-defined subgroups.

Despite conducting several hundred analyses, correcting for multiple comparisons in the course of this sort of research was deemed inappropriate for several reasons most of which are summarized by Rubin (2017), O'Keefe (2003), and Rothmann (1990). First, multiple comparisons never influences statistics; Rubin (2017) notes a gambler might buy 100 lottery tickets to increase his or her chances of winning, but this does not alter the promise (i.e., p-values) of individual tickets. Second, my pre-registered hypotheses were specific to the overall pattern of correlates associated with a category—in this case 17 valenced primals—which entails examining many statistics. As long as conclusions are confined to the pattern and not a particular result, the multiple comparison problem is irrelevant because the analysis allows for a portion of false positives. (To aid researchers interested in particular relationships, I report significance thresholds of $p<.0001$.) Third, most multiple-comparison correction techniques are not designed for this sort of analysis approach involving several thousand analyses, potentially resulting in a large increase in false negatives (e.g., Rothman, 1990). Fourth, multiple comparison problems concern *p*-values and not effect sizes and I rely primarily on effect-sizes to interpret relationships. Fifth, with many large effect sizes, *p* values were often too small to play a meaningful role in comparing relationships. Sixth and seventh, whereas multiple comparison is most problematic when examining one sample and selectively reporting few results from many analyses conducted,

I examine all outcomes in multiple samples and report results of all analyses conducted. This approach precludes cherry picking. Still, multiple tests of the same hypothesis does inflate alpha levels (Rubin, 2017) and, though I analyze 17 statistically distinguishable primals, much of the variance is explained by one primal (*Good*). Therefore, I encourage some caution in the interpretation of these results.

Results

Those with more positive primals enjoyed more job success, but not much more and not always. Of the 68 relationships displayed in Table 4 (4 samples X 17 primals; total N=2,639), 36 were significant (p<.05). In all 36, negative primals were associated with less job success. Effect sizes were small (with none among Sample 5: Philly Professionals). This pattern of results held nearly without exception when looking across a variety of success indicators and 31 different occupations and occupational groups, as detailed below. Furthermore, putting aside those who see the world negatively, of 55 t-tests comparing job success levels among those who hold slightly positive versus distinctly positive primals where both groups ≥30, 19 were significant (p<.05). In all 19 cases, those with slightly positive primals reported less job success. Primals notably associated with job success included *Progressing*, *Pleasurable*, *Safe*, and *Good—Just* was predictive but not especially. Primals least related to job success include *Worth Exploring*, *Meaningful*, and *Funny*.

Table 4

Job Success' Relationship to 17 Primals Using Pearson's r

	Sample 2: YM.Org	Sample 3: mTurk [k]	Sample 5: Philly Pros	Sample 6: Undergrads
N	1639	476	98	426
Good	.22**	.10*	.09	.24**
Safe	.26**	.17*	.08	.23**
Pleasurable	.20**	.16*	.11	.21**
Regenerative	.15**	.09	.05	.16*
Progressing	.22**	.17*	.11	.20**
Harmless	.24**	.20**	.10	.12*
Cooperative	.16**	.09	**-.02**	.22**
Stable	.15**	.09	**-.03**	.12*
Just	.16**	.12*	.15	.14*
Enticing	.12**	.02	.11	.18*
Interesting	.13**	.01	.07	.18*
Beautiful	.09*	**-.01**	**-.02**	.16*
Abundant	.17**	.06	.18	.18*
Worth Exploring	.02	.01	.04	.13*
Meaningful	.09*	.05	.09	.07
Improvable	.07*	.02	.13	.12*
Funny	.03	.09	.05	.06

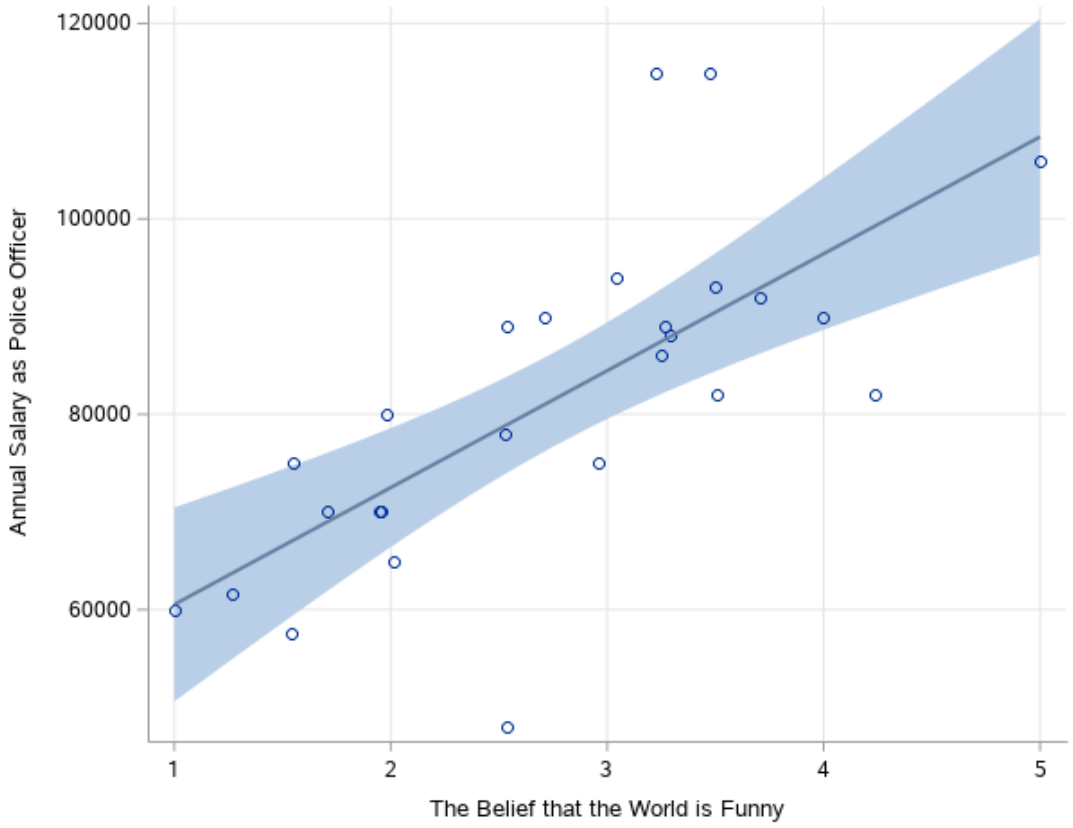
*p<.05 **p<.0001 *Note*. Negative relationships are bolded. [k] Derived from Kendall's τ b and then converted to a Pearson's *r*.

Occupation-Specific Success Results in Sample 2: YM.Org. Of 459 examined relationships between 17 primals and success within 27 occupation categories where $n \geq 30$, 110 relationships were significant (p<.05). In 97% of these relationships, negative primals were associated with less job success. Two of three exceptions were in the creative industry, driven by a sub-sample of filmmakers, musicians, and photographers within which success was associated with seeing the world as less *Beautiful* ($r(52)$=-.28, p=.043). The other exception was among college professors within which success was tied to seeing the world as less *Worth Exploring* ($r(30)$=-.36, p=.046). The only other significant relationship among professors was *Funny* ($r(30)$=.37, p=.037), which was positively related to success. Across relationships, *Enticing* and its tertiary primals were positively related to success 31 times, while *Safe* was related 65 times. Primals least related to success include *Worth Exploring*, *Meaningful*, and *Improvable*, which were only related one time each. Primals most related include *Harmless* (13 times), Safe (13 times), *Abundant* (9 times), *Pleasurable* (8 times), *Progressing* (8 times), *Beautiful* (8 times), *Just* (7 times), and *Interesting* (7 times). Positive primals were especially predictive of success among

a small sub-group of small business owners/entrepreneurs, including the belief that the world is *Progressing* ($r(32)=.55$, $p=.0008$) and *Regenerative* ($r(32)=.46$, $p=.006$).

Figure 5

Relationship of r=.71 Between Funny and Salary in a Small Sub-Sample of Police Officers



Occupation-Specific Success Results in Sample 5: Philly Pros. Within three small sub-samples of specific occupations in the Philadelphia metro area (car salespersons, lawyers, and police), I examined 204 relationships between 17 primals and 12 outcomes ((6 car salesperson outcomes x17)+(1 lawyer outcome x 17)+(5 police outcomes x17)), finding 24 significant positive relationships and no negative relationships. Twenty-one of the significant positive relationships, however, were among police officers. In this very small subsample ($n=26$), several positive primals were related to the composite success measure, including *Good*, *Regenerative*, *Enticing*, *Beautiful*, *Meaningful*, *Improvable*, and *Funny*. These relationships were driven more by the absence of annual community complaints than the presence of annual

community compliments, had no relationship to being awarded special assignments, and were especially related to salary, particularly among *Enticing* and it's tertiary primals. Figure 5 displays the strongest relationship found across all examinations of job success in all groups, which was between the belief that the world is *Funny* and salary ($r(24)=.71$, $p<.0001$), dropping nominally when controlling for age or years in law enforcement.

Occupation-Specific Success Results in Sample 6: Undergrads. High school and college grade point averages, as well as SAT scores, were generally unrelated to primals (see Table 5). Of seven significant relationships, two were negative, and all effects were small. Looking at a subgroup of students for which SAT Verbal and Math scores were available, *Cooperative*'s positive relationship to combined SAT scores was more driven by its relationship to Verbal scores than Math scores; *Safe*'s and *Progressing*'s positive relationship to combined SAT scores was more driven by Math than Verbal; and *Meaningful*'s negative relationship was driven by both Math and Verbal. Meanwhile, no negative primal and all positive primals were related to establishing good relationships with teachers and peers while in college.

Table 5

Academic Success' Relationship to 17 Primals Among Sample 6: Undergrads Using Pearson's r

	High School GPA[k]	SAT Scores[k]	Undergrad GPA[k]	Peer Relationships	Professor Relationships
N	468	446	470	463	469
Good	.06	.01	.01	.38**	.25**
Safe	.07	.12*	.05	.31**	.19**
Pleasurable	.09	.05	.03	.30**	.18*
Regenerative	.01	.05	.02	.24**	.13*
Progressing	.01	.18*	.01	.24**	.12*
Harmless	.07	.03	**-.00**	.13*	.12*
Cooperative	.04	.15*	.14*	.20**	.15*
Stable	.03	.06	**-.06**	.22**	.11*
Just	.03	**-.01**	**-.01**	.20**	.18**
Enticing	.04	**-.08**	**-.01**	.36**	.22**
Interesting	.01	**-.01**	.03	.34**	.17*
Beautiful	.08	**-.05**	.04	.25**	.16*
Abundant	.04	.01	**-.02**	.27**	.12*
Worth Exploring	.12*	**-.05**	.02	.18**	.13*
Meaningful	**-.05**	**-.18***	**-.03**	.30**	.17*
Improvable	.05	**-.04**	**-.07**	.24**	.20**
Funny	**-.02**	**-.04**	**-.11***	.21**	.13*

*$p<.05$ **$p<.0001$ *Note*. Negative relationships are bolded. [k] Derived from Kendall's τ b and then converted to a Pearson's *r*.

Discussion

If success is associated with negative primals in any occupation, prime candidates may be occupations involving low incidence of failure but high cost of failure, such as a police officer and lawyers. This did not bear out. In general, primals are not strongly associated with success outcomes, but, when they are associated, the connection is almost always to positive primals, including among low-failure-incidence and high-failure-cost jobs where this result is theoretically least likely. It may well be that in these contexts expecting the worst might have benefits, but these benefits might be counteracted by the negative effects of negative beliefs, such as being less agreeable, more introverted, less emotionally stable, less proactive, more suspicious of colleagues, and less happy, all of which is thought to impact workplace success (e.g., Rode et al., 2008; Boehm & Lyubomirsky, 2008). Also noteworthy was that in no occupation was less success associated with seeing the world as distinctly positive compared to slightly positive. The more positive, it seems, the more success, even for more objective measures of success less likely impacted by positivity bias (e.g., salary).

Nevertheless, these success measures were of variable quality and, the more objective and higher quality the measure, the smaller the relationship with primals appears to be. Analyses of Sample 2 and 3 relied on proxies for success—perhaps poor proxies—and the relationship between primals and success among Sample 4: Undergrads was driven by relationship scores—not more objective measures like grades and test scores. In Sample 5: Philly Professionals, which involved objective success metrics tailored to what success means in each profession (e.g., monthly cars sold for car salespersons), primals were quite unrelated to success. Though analysis of Sample 5's three sub-samples did reveal some fascinating and remarkably strong connections, these sub-samples were too small to justify conclusions of any strength. Further research should examine, for example, the altogether unbelievably high relationship between *Funny* and salary among police officers (r=.71), the moderate relationship between *Enticing* and peer friendships among undergraduates (r=.36), and the moderate relationships between *Progressing* and success among pre-college teachers (r=.41) and entrepreneurs (r=.36).

Results for *Just* were noteworthy for not being noteworthy. As mentioned, *Just* has received by far the most research attention, with several studies finding connections between *Just* and job success, productivity, grades, and even GDP (e.g., Furnham, 1993). The idea is that, similarly to why people work harder in contexts where they believe hard work will be rewarded, people work harder in *worlds* where they believe hard work will be rewarded. Though, unable to replicate Dalbert and Stoeber's (2005) connection between *Just* and grades among undergraduates, *Just* was nevertheless often related to success at low levels. But several other primals, including *Good*, *Safe*, *Pleasurable*, and *Progressing*, were just as if not more related to success. Researchers who study success factors might consider the role other primals play besides the belief that the world is just.

Study 2b: Job Satisfaction

Measure

I used Thompson and Phua's (2012) psychometrically-validated four-item Brief Index of Job Satisfaction Measure (BIAJS) to measure job satisfaction. This scale was designed as an affective measure of how one feels about their job, rather than a measure of objective job conditions, such as renumeration and opportunities for advancement. This scale includes no reverse-scored items. An example item is *I find real enjoyment in my job* and all items refer to "my job". Responses were collected on a five-point likert scale. I changed one word in the prompt for each sample as appropriate (e.g., Thinking specifically about your current job as a [*lawyer/care salesperson/student/police officer*], do you agree with the following?).

Analysis

Same as above.

Results

Subjects with more positive primals enjoyed more job satisfaction. Of 32 relationships displayed in Table 6 (17 primals x 2 samples; total N=583), 31 were significant (p<.05). In all 31, negative primals were associated with less job satisfaction. Several involved moderate effect sizes. When subsets of Philadelphia-area Professionals—car salespersons, lawyers, and

police—were examined individually, across 51 relationships (17 primals x 3 sub-samples), there were 24 significant relationships (p<.05). Again, in all 24 relationships, negative primals were associated with less job satisfaction. Furthermore, putting aside those who see the world negatively, in 24 t-tests comparing job satisfaction among those who held slightly positive versus distinctly positive primals where both groups ≥30, 17 were significantly different (p<.05). In all 17 cases, those with slightly positive primals reported less job success than those with distinctly positive primals. Primals notably associated with job satisfaction include *Improvable*, *Enticing*, *Progressing*, *Pleasurable*, *Safe*, and *Good*.

Table 6

Job Satisfaction's Relationship to 17 Primals Using Pearson's r

	Sample 5: Philly Pros	Sample 6: Undergrads
N	110	473
Good	.46**	.33**
Safe	.38**	.30**
Pleasurable	.42**	.27**
Regenerative	.31*	.21**
Progressing	.37*	.31**
Harmless	.18	.19**
Cooperative	.21*	.21**
Stable	.20*	.11*
Just	.38**	.17*
Enticing	.47**	.29**
Interesting	.37**	.22**
Beautiful	.39**	.22**
Abundant	.37**	.22**
Worth Exploring	.20*	.17*
Meaningful	.32*	.17*
Improvable	.46**	.25**
Funny	.22*	.21**

*p<.05 **p<.0001

Discussion

Job satisfaction has been previously tied to the belief the world is *Just* (e.g., Otto, Glaser, & Dalbart, 2009) but not other primals. In these two samples, negative primals (including *Just*) were routinely associated with slightly to moderately less job satisfaction. This connection to job *satisfaction* may partly explain why in Study 2a negative primals were hardly ever associated with job *success*. Even if in some occupational contexts negative primals contribute to job *success*, that contribution may be weak in comparison to the negative effects of negative primals on other

outcomes, one of which may be low job *satisfaction*, which is known to erode workplace performance (e.g., Rezvani et al., 2016). It should be noted, however, that these two samples represent a few hundred subjects (*N*=583) rather than the few thousand examined in connection to other outcomes. Still, because Sample 5: Philly Professionals involves three sub-samples in which similar effect-sizes were observed, it is not unreasonable to suppose that the observed pattern is somewhat common.

Study 2c: Physical Health

Measure

Butler and Kern's (2016) psychometrically-validated PERMA Profiler, which was used to measure general psychological flourishing (described below), includes a three-item global measure of physical health. Items are as follows:

1. In general, how would you say your health is? (0 = "terrible", 10 = "excellent)
2. How satisfied are you with your current physical health? (0 = "not at all", 10 = "completely)
3. Compared to others of your same age and sex, how is your health? (0 = "terrible", 10 = "excellent)

Analysis

Same as above.

Results

Subjects with more positive primals reported better physical health. Of 68 relationships displayed in Table 7 (4 samples X 17 primals; total *N*=2,393), there were 65 significant relationships ($p<.05$). In all 65, negative primals were associated with worse health, with most effect sizes in the small to moderate range. This pattern of results held nearly without exception when looking across 19 different occupations and occupational groups, as discussed below. Furthermore, putting aside those who see the world negatively, in 58 t-tests comparing health among those who held slightly positive versus distinctly positive primals where both groups ≥30, 43 were significantly different ($p<.05$). In all 43 cases, those with slightly positive primals reported worse health than those with distinctly positive primals. Primals most associated with job success included *Pleasurable* and *Safe.* For example, among 473 undergraduate students, *Safe*

correlated with better health at r=.40, p<.0001. Among those primals least related to health include *Worth Exploring* and *Funny*.

Table 7

Health's Relationship to 17 Primals Using Pearson's r

	Sample 1: AH.Org	Sample 3: mTurk	Sample 5: Philly Pros	Sample 6: Undergrads
N	1,118	692	110	473
Good	.25**	.35**	.39**	.36**
Safe	.24**	.31**	.36**	.40**
Pleasurable	.24**	.32**	.42**	.36**
Regenerative	.20**	.26**	.33*	.35**
Progressing	.20**	.30**	.26*	.25**
Harmless	.21**	.24**	.18	.26**
Cooperative	.13**	.14*	.23*	.29**
Stable	.12**	.12*	.27*	.26**
Just	.18**	.32**	.24*	.24**
Enticing	.17**	.29**	.33*	.23**
Interesting	.12**	.18**	.22*	.19**
Beautiful	.14**	.21**	.20*	.17*
Abundant	.15**	.28**	.37*	.22**
Worth Exploring	.07*	.22**	.14	.14*
Meaningful	.13**	.19**	.32*	.19**
Improvable	.19**	.29**	.36**	.18**
Funny	.08*	.15**	.08	.10*

*p<.05 **p<.0001

Occupation-Specific Health Results in Sample 1: AH.org. Within the 1,118 subjects who took both the PI-99 and PERMA Profiler, seven of ten professional groupings had n≥30: executives (n=49), managers (n=117), administrators and other professionals (n=360), clerks (n=61), skilled manual laborers (n=50), semi-skilled manual laborers (n=33), and no occupation (n=411). Eight of the 65 specific professions had n≥30: administrative person (n=46), licensed/certified professional (n=31), other manager (n=55), other professional (n=197), small business owner (n=30), student (n=351), teacher (n=39), and unemployed (n=35). Of 255 examined relationships ((7 occupation groupings + 8 specific occupations) X 17 primals), there were 84 significant relationships (p<.05). In all cases, more negative primals were associated with less health. *Worth Exploring* and *Funny* were most unrelated to psychological flourishing across occupations. Primals especially predictive of health include *Good*, *Safe*, *Pleasurable*, *Regenerative*, *Progressing*, *Harmless*, and *Abundant*. For example, health was related to

Pleasurable among executives ($r(47)=.43$, $p=.002$) and clerks ($r(58)=.43$, $p=.0002$) but not skilled manual laborers ($r(48)=.14$, $p=.31$).

Occupation-Specific Health Results in Sample 5: Philly Professionals. Of 51 relationships between 17 primals and health among 3 professions (car salespersons, lawyers, and police), 20 were significant ($p<.05$). In all 20 cases, the negative primal was associated with worse health. Only *Good* and *Abundant* were related to health in all three groups.

Discussion

Seeing the world as dangerous was associated with less physical health, with small to moderate effect sizes. This replicates in 2,393 subjects in four samples and 19 occupation groups what Clifton and colleagues (2019) had found earlier in one sample of 524 subjects using a preliminary version of the Primals Inventory: there is a connection between primals and health. Positivity bias (or negativity bias), however, is likely a systematic source of error influencing measures of both health and primals. Yet it is not clear how this source of error could fully explain sometimes sizeable levels of covariance (e.g., $r=.40$ between health and *Safe* among 473 undergraduates) or the consistent differentiation seen between particular primals and health (e.g., health was more highly correlated with *Safe* than *Enticing* in all 4 samples). This suggests that, in addition to belief valence, belief content also matters.

The size and direction of the relationship between primals and health is not necessarily obvious. The avoidance of many physical dangers requires preparation and alertness, which can be motivated by the expectation that dangers are likely to be encountered, which may be driven in part by the belief that the world is generally a dangerous place (i.e., low *Safe* scores). It may also be the case that poor physical health can cause one to see the world as more dangerous, since declining health increases real and perceived vulnerability to increasingly less severe threats. Yet, recently argued (Clifton, 2020), the research thus far suggests that primals more often function as lenses used to interpret experiences while being themselves relatively uninfluenced by those experiences. If so, primals may not reflect experiences of being healthy or unhealthy in this sort of straightforward manner.

Another possibility is that negative primals contribute to poor health outcomes. Five causal pathways were recently proposed (Clifton & Kim, 2020). First and second, threat-relevant primals might influence perceptions of danger (e.g., percepts of a poisonous snake in the grass), resulting in (a) more frequent and acute stimulation of the cardiotoxic stress axis as well as (b) the gene expression pattern known as the conserved transcriptional response to adversity. These processes are associated with chronic and inflammation-related conditions including cancer, type 2 diabetes, heart disease, and neurodegenerative disease. Third, primals such as *Improvable* might influence adherence to healthy behaviors, such as diet and exercise. Fourth, primals such as *Regenerative* and *Just* may influence treatment expectations, which are known to influence treatment outcomes through placebo effects and other mechanisms. For example, *Just* has already been tied to physician-adjudicated recovery from myocardial infarction (Agrawal & Dala. 1993). Fifth, Clifton and colleagues (2019) theorized that *Good*, *Meaningful*, and *Needs Me* should contribute to the pattern of thought and action often understood to be trait optimism and having purpose in life, both of which have been associated with positive outcomes when facing several age-related chronic conditions (e.g., Alzheimer's, stroke, respiratory disease). Indeed, optimists appear to live 11-15% longer than pessimists (Lee et al., 2019). Building on above results and these hypotheses, a good next step towards exploring the primals-health connection would be to compare Primals Inventory scores to more objective measures of physical health (e.g., blood pressure) as well as automatic physiological responses to potentially threatening but ambiguous stimuli.

Study 2d: Negative Emotion

Measure

Butler and Kern's (2016) PERMA Profiler also includes a three-item global measure of negative emotion frequency, as follows:

1. In general, how often do you feel anxious? (0 = "never", 10 = "always")
2. In general, how often do you feel angry? (0 = "never", 10 = "always")
3. In general, how often do you feel sad? (0 = "never", 10 = "always")

Negative emotion frequency typically correlates negatively with psychological flourishing and positive emotion, but remains sufficiently unrelated to warrant separate treatment.

Analysis

Same as above.

Results

Subjects with more positive primals reported more infrequent negative emotions. Of 85 relationships displayed in Table 8 (5 samples X 17 primals; total N=2,491), there were 75 significant relationships (p<.05). In all 75, negative primals were associated with more frequent negative emotions, with effect sizes ranging from small to r=-.50. This largest effect size was found between negative emotions and *Pleasurable* among 473 undergraduates. Similar results were observed when looking across 19 occupations and occupational groups, as discussed below. Furthermore, putting aside those who see the world negatively, in 65 t-tests comparing negative emotion frequency among those who held slightly positive versus distinctly positive primals where both groups ≥30, 49 were significantly different (p<.05). In all 49 cases, those with slightly positive primals reported more frequent negative emotions than those with distinctly positive primals. For example, 309 mTurkers who saw the world as slightly *Safe* averaged 4.9 out of 10 on negative emotion frequency while 78 subjects who saw the world as distinctly *Safe* averaged 2.9 on negative emotion frequency (t=9.5, p<.0001). In general, primals most associated with negative emotion infrequency include *Pleasurable* and *Stable.* Among those least related include *Worth Exploring* and *Funny*.

Table 8

Negative Emotions' Relationship to 17 Primals Using Pearson's r

	Sample 1: AH.Org	Sample 3: mTurk	Sample 4: Immigrants	Sample 5: Philly Pros	Sample 6: Undergrads
N	1,118	692	98	110	473
Good	-.44**	-.46**	-.35*	-.42**	-.42**
Safe	-.43**	-.41**	-.33*	-.48**	-.44**
Pleasurable	-.42**	-.41**	-.33*	-.50**	-.39**
Regenerative	-.39**	-.39**	-.15	-.34*	-.31**
Progressing	-.29**	-.28**	-.22*	-.33*	-.31**
Harmless	-.24**	-.24**	-.34*	-.32*	-.25**
Cooperative	-.33**	-.34**	-.20	-.39**	-.34**
Stable	-.32**	-.31**	-.25*	-.40**	-.35**
Just	-.19**	-.17**	-.23*	-.23*	-.24**
Enticing	-.35**	-.43**	-.23*	-.26*	-.29**
Interesting	-.37**	-.49**	-.30*	-.25*	-.24**
Beautiful	-.24**	-.33**	-.23*	-.22*	-.21**
Abundant	-.33**	-.35**	-.15	-.23*	-.24**
Worth Exploring	-.15**	-.27**	-.05	**.05**	-.09
Meaningful	-.32**	-.49**	-.13	-.31*	-.25**
Improvable	-.31**	-.31**	-.12	-.27*	-.28**
Funny	-.17**	-.11*	-.13	-.06	-.18**

*p<.05 **p<.0001 *Note*. Bold highlights the one positive relationship.

Occupation-Specific Negative Emotion Results in Sample 1: AH.Org. As described above, within the 1,118 subjects who took both the PI-99 and PERMA Profiler, seven of ten professional groupings and eight of 65 specific occupations had $n \geq 30$. Of 255 examined relationships ((7 occupation groupings + 8 specific occupations) X 17 primals), there were 151 significant relationships (p<.05). In all cases, more negative primals were associated with more frequent negative emotions. For example, negative emotions were strongly negatively correlated to *Interesting* among executives ($r(47)$=-.52, p=.0001), teachers ($r(37)$=-.57, p=.0002) and the unemployed ($r(33)$=-.60, p=.0002).

Occupation-Specific Negative Emotion Results in Sample 5: Philly Pros. Of 51 relationships between 17 primals and flourishing among 3 professions (car salespersons, lawyers, and police), 21 were significant (p<.05). In all 21, the negative primal was associated with more frequent experiences of negative emotion. Only *Worth Exploring* and *Funny* were unrelated to negative emotion in all three groups, while only *Safe* and *Pleasurable* were related in all three groups, with effect sizes ranging from .36 to .64.

Discussion

Subjects with more negative primals reported more frequent negative emotions, often much more. While it is possible that negative primals sometimes protect the individual from negative emotions such as disappointment, negative primals might in many other ways induce negative emotions, dwarfing any possible benefit. For example, negative primals like the belief that the world is a place where most things and situations tend to fall apart (*Stable* vs. fragile) may contribute to fear and anxiety across a variety of circumstances. Anxiety is in turn connected to many negative outcomes, such as poor academic performance (e.g., Liu, 2006), that may in turn induce further negative emotions, increase negative beliefs, and so forth in the sort of self-perpetuating circle described by Fredrickson (e.g., 2001). Other research on negative beliefs, such as negative beliefs about one's partner (e.g., Niehuis, 2011) or one's abilities (e.g., King, 2016) connect negative beliefs with negative emotion. Indeed, a half-century of depression research suggests that negative beliefs about the self, one's future, or one's social environment (Beck's cognitive Triad, discussed below) do not protect the individual from negative emotion, but instead propels the individual towards both increased negative affect and clinical depression (Beck, 1963, 1964, 1967, 2005; Beck et al., 1979; Butler et al., 2006; Hofmann et al., 2012).

Study 2e: Depression

Measure

I used Antony, Bieling, Cox, Enns, and Swinson's (1998) 21-item Depression Anxiety Stress Scales (DASS-21) to measure depression. No items are reverse-scored and responses were collected on a 4-point likert scale (*never*, *sometimes*, *often*, *almost always*). An example item is *I was unable to become enthusiastic about anything*. However, in Sample 1: AuthenticHappiness.Org, the DASS-21 was not available. For that sample, I analyze Radloff's (1977) 20-item CES-D, with four reverse-scored items. Example items include *I felt lonely* and *I had crying spells*. Response were collected on 4-point likert scale: *Rarely or none of the time (less than 1 day)*, *Some or a little of the time (1-2 days)*, *Occasionally or a moderate amount of the time (3-4 days)*, and *Most or all of the time (5-7 days)*. Both scales asked how people had

been feeling over the past week, with items probing various symptoms of depression. Both scales have been validated as measures of depression symptoms in nonclinical contexts.

Analysis

Same as above.

Table 9

Depression's Relationship to 17 Primals Using Pairwise Pearson's r

	Sample 1: AH.Org	Sample 3: mTurk	Sample 6: Undergrads
N	1,291	692	473
Good	-.48**	-.52**	-.49**
Safe	-.45**	-.40**	-.45**
Pleasurable	-.49**	-.45**	-.43**
Regenerative	-.40**	-.44**	-.38**
Progressing	-.32**	-.26**	-.29**
Harmless	-.30**	-.16**	-.21**
Cooperative	-.27**	-.34**	-.29**
Stable	-.31**	-.25**	-.37**
Just	-.37**	-.22**	-.30**
Enticing	-.36**	-.53**	-.39**
Interesting	-.28**	-.54**	-.33**
Beautiful	-.23**	-.40**	-.24**
Abundant	-.34**	-.42**	-.27**
Worth Exploring	-.11*	-.36**	-.23**
Meaningful	-.34**	-.60**	-.41**
Improvable	-.36**	-.37**	-.28**
Funny	-.17**	-.15**	-.21**

*p<.05 **p<.0001

Results

Subjects with more positive primals reported fewer depression symptoms. Of 51 relationships displayed in Table 9 (3 samples X 17 primals; total N=2,456), all were significant (p<.05)—all but one at p<.0001—and in all cases negative primals were associated with increased levels of depression, typically involving moderate to large effect sizes. This pattern held when looking across 19 represented occupations, as detailed below. Furthermore, putting aside those who see the world negatively, of 49 t-tests comparing those who hold slightly positive versus distinctly positive primals in which both groups had ≥30 subjects, 45 were significantly different (p<.05). In all 45 cases, those with slightly positive primals were more depressed than those with distinctly positive primals. Primals most associated with less depression include *Good*, *Safe*, *Enticing*, *Interesting*, and *Meaningful*.

Occupation-Specific Depression Results in Sample 1: AH.Org. Within the 1,291 subjects who took both the PI-99 and the CES-D, seven of ten professional groupings had $n \geq 30$: executives (n=61), managers (n=151), administrators and other Professionals (n=405), clerks (n=73), skilled manual laborers (n=55), semi-skilled manual laborers (n=42), and no occupation (n=460). Ten of the 65 specific professions had $n \geq 30$: administrative person (n=52), licensed/certified professional (n=46), other manager (n=71), other professional (n=203), retired (n=33), small business owner (n=42), student (n=373), teacher (n=49), and unemployed (n=41). Of 289 examined relationships ((7 occupation groups + 10 specific occupations) X 17 primals), there were 221 significant relationships (p<.05). In all 221 cases, negative primals were associated with increased depression, though with some variation by occupation. For example, depression and *Good* were less correlated among administrators ($r(50)$=-.30, p=.03) and artists ($r(29)$=-.41, p=.02) than among the unemployed ($r(39)$=-.65, p<.0001), retirees ($r(31)$=-.69, p<.0001), and small business owners ($r(40)$=-.59, p<.0001).

Discussion

Negative primals are strongly associated with depression. Sample 1 effect sizes are also slightly suppressed because a substantial minority did not take the primals and depression measures concurrently but on average several months apart. While of course cross-sectional research like this cannot indicate causation, such results are highly consistent with theoretical paradigms that do suggest causation.

From ancient times until the 1970s, highly negative yet non-delusional beliefs like *People despise me* or *This situation is hopeless* were listed among symptoms of melancholia/depression (Radden, 2002; Lewinsohn et al., 1976; Berger, 1977; Lewinsohn & Youngren, 1976; Coyne & Gotlib, 1983; Haas & Fitzgibbon, 1989). The consensus that negative beliefs were primarily symptoms of depression persisted even after Beck (1963, 1964, 1967; Beck et al., 1979) suggested that negative beliefs are more cause than symptom. Correlational research at the time found strong relationships between depression and negative beliefs—similar to results above—but was of course unconvincing. Many noted that large effect sizes between depression and

negative beliefs are equally explained by either the depressive state causing the belief or the belief causing the depressive state (e.g., Lewinsohn et al., 1981; Beidel & Turner, 1986; Haas & Fitzgibbon, 1989; Coyne & Gotlib, 1983). What finally clarified the role of negative beliefs was the success of *Cognitive Behavioral Therapy* (CBT), which aims to increase the patient's ability to persuade themselves of more positive, functional, (and often seemingly more accurate) beliefs. For example, two meta-meta-analyses examining 285 meta-analyses from 1994 to 2011 concluded that, compared to alternatives (including nondirective therapy, relaxation therapy, supportive therapy, and a variety of pharmacological interventions and other treatments), CBT is typically a more effective tool capable of moderate to large treatment effects (Butler et al., 2006; Hofmann et al., 2012). Today, CBT is by far the most widespread form of talking therapy and has been adapted to treat many mental health issues besides depression largely because the impact of negative beliefs is not limited to depression. Most treatments approved by the Society of Clinical Psychology (2013) are either CBT or CBT-related. Field, Farnsworth, and Nielsen (2014) found that 94% of American counselors using any evidence-based treatment used CBT and conclude that evidence-based treatment is likely to remain practically synonymous with CBT for the foreseeable future.

Beck and CBT are relevant to the interpretation of above correlations because primals are highly similar to—and to some degree already are—the beliefs Beck highlighted and CBT was designed to target. Beck organized depression-relevant beliefs into three topics called the *Cognitive Triad*: beliefs about the self (e.g., *I am worthless*), the self's future (e.g., *Nobody will ever love me*), and the self's world (e.g., *My boss hates me*). Though primals likely fall within the latter category, Beck used the term *world* primarily to refer to the individual's immediate social environment, as the preponderance of his published examples suggest and he himself has confirmed (personal communication, March 1st 2019). Nevertheless, Beck's suggestion about topics of belief may be less pertinent than the sort of modifiers he considered to be depression-relevant. For example, the beliefs *I am of average height*; *I am extroverted*; or *I have a soul*; are not generally seen as depression relevant, despite being beliefs about the self, because

depression-relevant beliefs involve particular modifiers. In the three prominent paragraphs introducing the Cognitive Triad in *Cognitive Therapy of Depression* (Beck et al., 1979, p. 11), the following modifiers are used: *negative*, *defective*, *inadequate*, *diseased*, *deprived*, *undesirable*, *worthless*, *hard*, *frustrating*, *failed*, *uncomfortable*, and *difficult*. Primals are described and measured using similar modifiers—sometimes precisely the same ones. Clifton (2018) observed that Beck's modifiers are typically simple, global, current, stable, goal-relevant, and reaction-normative—quite a specific type. Thus, if primals were found to not influence outcomes like depression, then primals' special irrelevance to depression and other outcomes would itself require some explanation.

Thus, for strong empirical and theoretical reasons, primals cannot be dismissed as mere symptoms of depression until more research is done. A key next step would be creating a CBT module targeting primal world beliefs and then running a randomized controlled trial to test the relative impact of a CBT-only condition, a primals module condition, a CBT + primals module condition, and a control condition. In addition to providing crucial information about causality, this research could shed light on how primals relate to other mental health problems where similar beliefs are thought to play a role and CBT is now commonly used as a treatment, such as generalized anxiety, stress, and suicidal thoughts.

Study 2f: Attempted Suicide

Measure

I used one item from Osman and colleagues' (2001) four-item Suicidal Behaviors Questionnaire-Revised scale to measure having attempted suicide. This scale has been validated for clinical and nonclinical samples. The item used was *Have you ever thought about or attempted to kill yourself?* Response options were collected on the following six-point scale: *Never* / *It was just a brief passing thought* / *I have had a plan at least once to kill myself but did not try to do it* / *I have had a plan at least once to kill myself and really wanted to die* / *I have attempted to kill myself, but did not want to die* / *I have attempted to kill myself, and really hoped to die*. This item was selected because it was the only item concerning attempted suicide.

Analysis

Since suicide data was ordinal and subjects not normally distributed, correlations were derived from Kendall's *τ* b (a non-parametric test) and then converted to Pearson's *r*. Otherwise, same as above.

Table 10

Attempted Suicide's Relationship to 17 Primals Using Kendall's τ b Converted to Pearson's r

	Sample 5: Philly Pros	Sample 6: Undergrads
N	110	473
Good	-.20	-.32**
Safe	-.25*	-.26**
Pleasurable	-.20	-.34**
Regenerative	-.17	-.17*
Progressing	-.30*	-.21*
Harmless	-.12	-.10
Cooperative	-.14	-.12*
Stable	-.35*	-.15*
Just	-.10	-.24**
Enticing	-.06	-.27**
Interesting	-.11	-.18*
Beautiful	**.08**	-.16*
Abundant	-.11	-.23**
Worth Exploring	**.16**	-.09
Meaningful	-.15	-.37**
Improvable	-.02	-.21*
Funny	**.07**	-.06

*p<.05 **p<.0001 *Note*. Positive relationships are bolded.

Results

Subjects with more positive primals were less likely to have seriously contemplated or attempted suicide. Of 32 relationships displayed in Table 10 (17 primals x 2 samples), there were 17 significant relationships (p<.05). In all 17, negative primals were associated with increased suicide attempts, with five involving effect sizes r > .30. Furthermore, putting aside those who see the world negatively, of 24 t-tests comparing those who hold slightly positive versus distinctly positive primals in which both groups had ≥30 subjects, four were significantly different (p<.05). In all four cases, those with slightly positive primal world beliefs were less likely to have ever attempted suicide than those with distinctly positive primals. Primals notably associated (negatively) with attempted suicide were *Meaningful*, *Progressing*, and *Stable*.

Discussion

Suicide kills approximately 800,000 annually, making it the 17th leading cause of death worldwide, with 79% of deaths occurring in low- and middle-income countries (World Health Organization, 2016). A predictor of suicide is being bullied and bullying others, either online or in person (Hinduja & Patchin, 2010)). Above results suggest that another predictor are more negative primal world beliefs. The strongest relationship was the belief among 473 college students that the world is meaningless (i.e., a place where most things, situations, and events likely do not matter, r=-.37, p<.0001). While most effect sizes are smaller than those in connection to some other outcomes examined in this chapter, they are in some ways more remarkable. Other outcomes concern concurrent states and feeling states (e.g., depression) whereas this outcome is the lifetime prevalence of a discrete, highly memorable event possibly having occurred many years prior. Error due to misremembering is likely low and the concern that the negative primal is a symptom of the outcomes is muted. Further research might examine whether suicide risk factors include low scores on *Good*, *Meaningful*, *Safe*, and *Enticing*.

One prominent theory of suicide is the Interpersonal Theory of Suicide (Van Orden et al., 2010). It suggests that certain beliefs about the self, especially the belief that one does not belong and is a burden on others, contributes to hopelessness, leading to suicidal desire. This desire, when combined with the presence of suicide capabilities (e.g., a weapon), can result in lethal or near-lethal action. Given this emphasis on belongingness, one exception to Study 2's analysis plan was made: the author examined the relationship between attempted suicide and the belief that the world has an important role for the individual to play—the primal *Needs Me*—which is not one of the 17 valenced primals examined in this chapter. Indeed, *Needs Me* is perhaps the primal most correlated with attempting suicide (undergrads: r(474)=-.31, p<.0001; Philly professionals: r(108)=-.24, p=.048). Future suicide research, as well as research into the other seven outcomes examined in this study, might examine *Needs Me* or any of the nine other primals not examined in Study 2's search for the value of negative primals.

Study 2g: Life Satisfaction

Measure

I used Diener, Emmons, Larsen, and Griffin's psychometrically-validated five-item Satisfaction With Life Scale (SWLS) to measure life satisfaction, which has been cited over 25,000 times (Google Scholar, Feb. 2020). It was designed to measure a global judgement of one's life according to one's own criteria. It includes no reverse-scored items. Example items are *In most ways my life is close to my ideal* and *If I could live my life over, I would change almost nothing*. Responses were collected on a seven-point likert scale.

Analysis

Same as above.

Results

Subjects with more positive primals enjoyed more life satisfaction. Of 102 relationships displayed in Table 11 (6 samples X 17 primals; total N=2,773), there were 99 significant relationships (p<.05). In all 99, negative primals were associated with less life satisfaction, with many effect sizes moderate and some large. This pattern held without exception when looking across 21 different professions, as detailed below. Furthermore, putting aside those who see the world negatively, of 82 t-tests comparing those who hold slightly positive versus distinctly positive primals in which both groups had ≥30 subjects, 62 were significantly different (p<.05). In all 62 cases, those with slightly positive primal world beliefs reported worse life satisfaction than those with distinctly positive primals. Primals notably associated with life satisfaction include *Good*, *Safe*, *Pleasurable*, and *Just*. Primals least related include *Worth Exploring*, *Funny*, *Meaningful*, and *Improvable*.

Occupation-specific Life Satisfaction Results in Sample 1: AH.Org. Within the 1072 subjects who took both the PI-99 and SWLS, seven of the 10 professional groupings had n≥30: executives (n=46), managers (n=113), administrators and other professionals (n=348), clerks (n=60), skilled manual laborers (n=53), semi-skilled manual laborers (n=30), and no occupation (n=384). Seven of the 65 specific professions had n≥30: administrative person (n=41), other

manager (*n*=54), other professional (*n*=190), small business owner (*n*=36), student (*n*=320), teacher (*n*=40), and unemployed (*n*=34). Across 238 examined relationships (14 professions X 17 primals), there were 145 significant relationships ($p<.05$). In all 145, negative primals were associated with less life satisfaction. *Worth Exploring* was especially unrelated to life satisfaction across groups and all primals were unrelated to life-satisfaction among skilled manual laborers. Life satisfaction was strongly related to *Enticing* among the unemployed ($r(34)=.67$, $p<.0001$). Among clerks, *Meaningful* was especially predictive ($r(58)=.50$, $p<.0001$). Among executives, *Interesting* was strongly related ($r(44)=.57$, $p<.0001$).

Occupation-Specific Life Satisfaction Results in Sample 2: YM.Org. Within the 328 Sample 2 subjects who took both the PI-99 and the SWLS, there were three sub-samples where $n \geq 30$: students (*n*=42), tech workers (*n*=32), and a category of miscellaneous professionals including farmers, financiers, insurers, and journalists (*n*=84). Of 51 relationships between primals and life satisfaction in these sub-samples (17x3), 31 were significant ($p<.05$). In all cases, the negative primal was associated with less life satisfaction. For example, the belief that the world is *Meaningful* and *Progressing* was highly correlated with life satisfaction among students ($r(40)=.56$, $p=.0001$; $r(40)=.51$, $p=.0006$) but not tech workers ($r(30)=.23$, $p=.19$; $r(30)=.24$, $p=.15$). In all three groups, the more subjects saw the world as *Good* the higher was their life satisfaction: students ($r(40)=.49$, $p=.001$), tech workers($r(30)=.51$, $p=.002$), and the miscellaneous category ($r(82)=.62$, $p<.0001$).

Table 11

Life Satisfaction's Relationship to 17 Primals Using Pearson's r

	Sample 1: AH.Org	Sample 2: YM.Org	Sample 3: mTurk	Sample 4: Immigrants	Sample 5: Philly Pros	Sample 6: Undergrads
N	1072	328	692	98	110	473
Good	.43**	.52**	.49**	.42**	.55**	.54**
Safe	.37**	.45**	.45**	.50**	.50**	.49**
Pleasurable	.43**	.45**	.45**	.39**	.52**	.50**
Regenerative	.32**	.32**	.37**	.29*	.33*	.38**
Progressing	.27**	.30**	.38**	.30*	.41**	.33**
Harmless	.24**	.32**	.36**	.46**	.29*	.25**
Cooperative	.22**	.27**	.23**	.45**	.34*	.35**
Stable	.20**	.30**	.27**	.43**	.39**	.34**
Just	.34**	.34**	.47**	.29*	.39**	.32**
Enticing	.37**	.42**	.37**	.21*	.49**	.47**

Interesting	.25**	.38**	.18**	.20*	.45**	.42**
Beautiful	.29**	.35**	.35**	.21*	.36*	.38**
Abundant	.31**	.37**	.35**	.21*	.42**	.39**
Worth Exploring	.15**	.16*	.20**	.00	.22*	.31**
Meaningful	.28**	.36**	.24**	.03	.47**	.31**
Improvable	.32**	.27**	.38**	.18	.41**	.32**
Funny	.26**	.16*	.26**	.22*	.20*	.22**

*p<.05 **p<.0001

Occupation-Specific Life Satisfaction Results in Sample 5: Philly Pros. Of 51 relationships between 17 primals and life satisfaction among 3 professions (car salespersons, lawyers, and police), 40 were significant (p<.05). In all cases the negative primal was associated with less life satisfaction, with many moderate and large effects. For example, life satisfaction was highly correlated with *Cooperative* among car salespersons at r=.63; with *Interesting* among lawyers at r=.49; and with *Safe* and *Pleasurable* among police officers, both at r=.71.

Discussion

Life satisfaction was strongly related to holding positive primals. There were no exceptions across samples, professions, or primals, and effect sizes were routinely moderate to large. Samples 1 and 2 also involved subjects who did not take measures concurrently, which likely dampened effect sizes. Given these results and the diversity of samples and occupations considered, there appears to be a robust connection in the population between one's opinion about the sort of reality one finds oneself in and one's opinion about the quality of one's own life.

This connection is not necessarily obvious. Satisfaction with life is largely unrelated to objective life circumstances (e.g., finances, physical health, Argyle, 1987), involving instead an explicit comparison between one's own life and some reference norm (e.g., Fox & Kahneman, 1992). Historically, there has been some debate regarding the nature of this norm. One line of inquiry suggests that life satisfaction springs from comparisons made between one's current circumstances and one's previous circumstances, as well as conjectures of other directions life could have taken (e.g., Fox & Kahneman, 1992; Zhang et al., 2014). Another line of research suggests the reference norm is primarily social—sometimes called Social Reference Theory—involving what an individual believes to be happening in the lives of others, presumably in domains one has limited information, such as romance (e.g., Cheung & Lucas, 2016; Zaborskis et

al., 2019; Frison & Eggermont, 2016; Boyce et al., 2010; Fox & Kahneman, 1992). In both understandings, negative primals theoretically should lead to not lower but higher life satisfaction. If primals operate as maximally general schemas used to interpret reality as has been theorized (Janoff-Bulman, 1989; Clifton et al., 2019; Clifton, 2018, 2020), then primals should presumably be used to interpret what is happening in the lives of others, a topic involving more ambiguity compared to knowledge of one's own life. For example, if a white upper-middle class soccer mom living in a high-income neighborhood sees the world as a dangerous place, she might consider herself as having successfully carved out a modestly safe portion of the world and feel very fortunate to have been spared the perils that most others face. Likewise, if primals inform one's sense of what could have been, then a negative primal like the belief that the world tends to fall apart (i.e., low *Regenerative* scores) might lead one to think that life could have been much worse (i.e., the counterfactual referent) or has become worse (i.e., the personal history referent). Indeed, if primals influence ambiguity interpretation writ large, then negative primals theoretically should negatively impact perceptions of all possible referents—though presumably to different degrees—making one's own life look better in comparison. Indeed, in a terrible world, a mediocre life is a great success, but above results are inconsistent with this line of thinking.

Two other perspectives of life satisfaction are more consonant with above results, often called the *bottom-up* and *top-down* approaches (e.g., Erdogan et al., 2012). The bottom-up approach frames life satisfaction as a general judgement that aggregates domain-specific judgements. For example, Cummins' (1996) organized 173 studied domains into seven: material wellbeing, health, productivity, intimacy, safety, community, and emotional wellbeing. Domains are presumably weighted differently by each individual. Alternatively, the top-down approach considers life satisfaction to be an expression of stable person characteristics or traits—some people are simply more easily satisfied. If primals influence ambiguity interpretation and judgements of domains require ambiguity interpretation, then primals' should influence domain-specific judgements, which would be aggregated as systematic variance into the overall life judgement. If primals and life satisfaction are globalized value judgements of extremely large and

heterogenous objects, and given Clifton and colleagues' (2019) suggestion that the primary primal *Good* is largely determined by aggregating judgements of secondary and tertiary primals, *Good* may be formed by many of the same bottom-up judgement-related mechanisms and biases used to aggregate judgements of more specific life domains into the overall judgement of life satisfaction. Moreover, primary, secondary, and tertiary judgements—as well as how they are weighted and aggregated by individuals—may be systematically influenced by various personality traits, including meta-beliefs and BIG 5 personality traits. An example meta-belief capable of influencing both is *when it comes to global value judgements of things one has to live with, it's always good to err on the positive side*. This meta-beliefs may motivate individuals to see value in, for example, purchased items one cannot return, a spouse one cannot leave, a life that cannot be re-lived (i.e., life satisfaction), or a world one cannot escape (primal world beliefs). Though the best candidate BIG 5 trait for influencing both life satisfaction and primals is neuroticism—since of BIG 5 traits neuroticism most strongly predicts life satisfaction—effect sizes between neuroticism and life satisfaction are not large enough to explain the relationship between life satisfaction and *Safe*, let alone other primals which are les related to neuroticism (Steel et al., 2008; Clifton et al., 2019). Finally, one of the simplest explanations of covariance may be causal. In *The Tale of Genji* (2014/1000, p. 134) Shikibu writes, "It was a difficult world, which refused to give satisfaction." Primals may influence a variety of behaviors and outcomes, including one's emotional state, which impacts overall life satisfaction. This explanation presumes increased difficulty when trying to find satisfaction in any place perceived as terrible, barren, dangerous, and so forth, whether the place in question is a home, a restaurant, a town, or a world.

Study 2h: Psychological Flourishing

Measure

Butler and Kern's (2016) psychometrically-validated PERMA Profiler was used to measure general psychological flourishing. Whereas the SWLS scale assesses a global judgement of one's life based on one's own criteria that the researcher must guess at, the PERMA Profiler measures five dimensions of psychological flourishing that most humans

intrinsically value and weights them equally: positive emotion, engagement, relationships, meaning, and accomplishment (Seligman, 2011). Scores on the five three-item subscales strongly intercorrelate and were aggregated into a 15-item general measure, as is commonly done. No items are reverse-scored. An example item from the relationships subscale is *To what extent do you feel loved?* Responses were collected on an eleven-point scale.

Analysis

Same as above.

Results

Subjects with more positive primals enjoyed more psychological flourishing. Of 85 relationships displayed in Table 12 (5 samples X 17 primals; total N=2,491), 82 were significant (p<.05). In all 82 cases, negative primals were associated with less psychological flourishing, often with large effect sizes. This pattern held when looking across 19 different occupations, as detailed below. Furthermore, putting aside those who see the world negatively, of 65 t-tests comparing those who hold slightly positive versus distinctly positive primals in which both groups had ≥30 subjects, 58 were significantly different (p<.05). In all 58 cases, those with slightly positive primal world beliefs enjoyed less psychological flourishing than those with distinctly positive primals. Primals notably associated with psychological flourishing include *Good*, *Enticing*, and *Abundant*. Primals least related include *Worth Exploring* and *Funny*.

Table 12

Psychological Flourishing's Relationship to 17 Primals Using Pearson's r

	Sample 1: AH.Org	Sample 3: mTurk	Sample 4: Immigrants[PR]	Sample 5: Philly Pros	Sample 6: Undergrads
N	1,118	692	98	110	473
Good	.48**	.61**	.43**	.57**	.60**
Safe	.39**	.50**	.41**	.45**	.51**
Pleasurable	.44**	.53**	.35*	.57**	.51**
Regenerative	.36**	.46**	.23*	.41**	.41**
Progressing	.27**	.41**	.25*	.33*	.32**
Harmless	.26**	.34**	.41**	.12	.23**
Cooperative	.20**	.25**	.27*	.37**	.35**
Stable	.21**	.25**	.35*	.31*	.36**
Just	.39**	.49**	.28*	.40**	.40**
Enticing	.41**	.55**	.32*	.57**	.53**
Interesting	.26**	.34**	.30*	.48**	.45**
Beautiful	.30**	.47**	.34*	.44**	.35**
Abundant	.35**	.49**	.28*	.56**	.41**
Worth Exploring	.20**	.37**	.05	.25*	.33**
Meaningful	.31**	.39**	.17	.52**	.46**
Improvable	.38**	.51**	.25*	.43**	.39**
Funny	.23**	.30**	.24*	.22*	.26**

[PR] Sample 4 did not complete the entire PERMA Profiler so combined scores on the positive emotion and relationship subscales were used as a proxy. *p<.05 **p<.0001

Occupation-Specific Psychological Flourishing Results in Sample 1: AH.Org. Within the 1,118 subjects who took both the PI-99 and PERMA Profiler, seven of ten professional groupings and eight of the 65 specific professions had $n \geq 30$ (detailed above). Of 255 examined relationships ((7 occupation groups + 8 specific occupations) X 17 primals), there were 160 significant relationships (p<.05). In 99% of them, the negative primal was associated with less psychological flourishing, often strongly. The one exception was one of the five significant relationships found in a subsample of 39 teachers in which seeing the world as more threatening (i.e. low *Harmless* scores) was tied to increased psychological flourishing (r=-.36, p=.026). Primals especially predictive of psychological flourishing include *Good*, *Just*, *Enticing*, and *Abundant*. For example, flourishing was strongly related to *Good* among executives (r(47)=.59, p<.0001) and students (r(349)=.51, p<.0001) but not administrative personnel (r(44)=.25, p=.097).

Occupation-Specific Psychological Flourishing Results in Sample 5: Philly Pros. Of 51 relationships between 17 primals and flourishing among 3 professions (car salespersons, lawyers, and police), 34 were significant (p<.05). In all cases the negative primal was associated with less psychological flourishing, with many moderate and large effects. For example, *Abundant*

was notably related to flourishing in all three groups (car salespeople, *r*=.71; lawyers, *r*=.57; police officers, *r*=.41). *Funny* and *Progressing* were the only primals not correlated with flourishing in any of these three occupations.

Discussion

Because life satisfaction judgements rely on the individual's own criteria, individuals may make these judgements in incommensurate ways, adding noise, suppressing effect sizes, and frustrating meaningful comparisons across persons. This can be partially side-stepped, however, by prescribing what the life domains will be and how they will be weighted. Seligman's (2011) definition of psychological flourishing specifies five domains and the PERMA Profiler weighs these five domains equally in an aggregated psychological flourishing score. These domains are frequency of positive emotion and engagement, quality of relationships, finding meaning in activities and life direction, and frequency and feelings of accomplishment. While domain scores tend to intercorrelate and may not be statistically distinct enough to be considered separately (e.g., Ryan et al., 2019; Seligman, 2018), the overall prescriptive measure of wellbeing allows for greater commensurability across persons and groups than life satisfaction measures.

Across persons, groups, and occupations, above results find psychological flourishing to be strongly related to holding positive primals, especially *Good* and *Enticing*, which replicates findings from Clifton and colleagues (2019). Effect sizes were often so large as to indicate that achieving high psychological flourishing if one sees the world strongly negatively is nearly a psychological rarity, as is the person who sees the world as exceedingly wondrous yet suffers low psychological flourishing—such exceptions should be studied. Likely some of this relationship between primals and psychological flourishing will be explained by measurement error, including positivity/optimism bias and shared method-variance. However, given the scale of effect sizes, for such an explanation to be sufficient either the Primals Inventory or the PERMA Profiler (or both) would have to be predominantly capturing error variance. Some of the relationship between primal world beliefs and psychological flourishing may also be explained by primal world beliefs influencing perceptions, feelings, and behaviors the way that any beliefs about the characteristics

of a place could influence a person while the person is in that place. Another explanation could involve causality in the other direction. For example, having deeper and more supportive relationships may increase emotional and material resilience in the face of hardship, thus actually making the world more dangerous, thus influencing danger perceptions. However, as I have recently argued (Clifton, 2020), primals may be largely unresponsive to past experiences in this way.

General Discussion

Primal world beliefs are (a) important to study; (b) challenging to study; and (c) have remained largely overlooked, all for precisely the same reason: because they are beliefs about the character of a uniquely encompassing place. As previously argued (Clifton & Kim, 2020), understanding the behavior of any given creature requires that the scientist observe the creature's behavior in multiple environments. Scientists who observe a creature in one environment only, such as a dog in a dog park, are handicapped observers, being unable to distinguish context-specific behaviors (i.e., a state-like reaction to particular environments, or at least the creature's beliefs/perceptions about that environment) from organism-specific behaviors (i.e., a trait-like expression of that creature's peculiar temperament). But what if a creature had beliefs about the character of an environment that, for whatever reason, the organism never leaves? If so, such beliefs would theoretically drive patterns of action that would manifest as organism-specific traits while actually being driven by context-specific reactions to underlying perceptions. Furthermore, if said environment became populated by other creatures who also never left, but viewed the character of said environment differently, all such creatures would be handicapped observers, unable to distinguish context-specific from organism-specific behaviors. Moreover, if these creatures were ignorant of their disagreement—which is likely if these beliefs are implicit—all such creatures should be expected to misattribute numerous individual differences to differences in traits, thereby committing the fundamental attribution error on a massive scale.

Clifton and colleagues' (2019) suggestion is that, for humans at least, this remarkable situation may be precisely the case. Substantial variance in human behaviors and outcomes (i.e., neuroticism, agreeableness, optimism, curiosity, gratitude, depression, subjective wellbeing, attachment style—perhaps most major variables psychologists study) could stem from 26 differences in opinion about the most psychologically salient characteristics of the one place humans never leave (i.e., primal world beliefs). Given the import of this suggestion—and the obvious need for experimental and quasi-experimental research to determine causation—the reader may find cross-sectional research like that above quite unsatisfying. Nevertheless, establishing the direction and typical size of correlational relationships has value for four reasons. First, correlations can point to promising areas of research. Second, there is a gap in the literature concerning primals' wellbeing correlates and the two studies that have been done found substantial effect sizes worth replicating (Clifton et al., 2019; Stahlmann et al., 2020).

Third, establishing primals' correlational relationship to wellbeing-related variables is valuable because, based on existing theory, the size and even direction of some of these relationships is not actually that obvious. Life satisfaction, for example, is commonly understood as a comparative judgement of one's own life against a referent, such as a sense of what could have been (Fox & Kahneman, 1992; Zhang et al., 2014; Cheung & Lucas, 2016; Zaborskis et al., 2019; Frison & Eggermont, 2016; Boyce et al., 2010). If so, living a mediocre life in an incredible world where much more was considered readily achievable should be less satisfying than living the same mediocre life in a terrible world in which one was highly fortunate—but above result indicate that seeing the world as a terrible place is associated with much lower life satisfaction. Another example is health: the belief that the world is dangerous should theoretically increase vigilance across circumstances, perhaps resulting in successful avoidance of physical dangers, dangerous habits, and pathogens, which should increase health outcomes—but seeing the world as dangerous is actually associated with moderately worse health.

Fourth, moving past what researchers might learn directly from correlational research, correlational research can provide fodder for interventions designed to counter certain meta-

beliefs that bolster negative primals. For example, a lawyer who thinks that lawyers who see the world as dangerous usually perform better than those that see the world as safe might be interested to know if, on average, this is not the case.

Study 1 attempted to establish some prevalence for these meta-beliefs by asking 180 parents which primals they thought most likely to help their children. Results suggested there are at least two prospective meta-beliefs that might encourage individuals to hold negative primals. First, a minority of parents—usually a fairly large minority and in one case a majority—reported their meta-belief that the best way to prepare their children to navigate life was to teach them the world is in different ways a terrible place, specifically that it is dangerous, unfair, not funny, unstable, cut-throat, and in decline. Secondly, looking at only those who saw more value in positive primals, clear majorities of parents saw less positive positive primals as better for their children than more positive positive primals. One parent volunteered the following rationale for this moderating approaching: *I don't want my children to have so much fear that they're afraid to get out there and try stuff, but I do want them to be cautious and not trust people and situations blindly*. In this line of thinking, positive primals are helpful but distinctly positive primals can make one naïve, overly trusting, and vulnerable. While this quote falls under prospective meta-belief #3 identified in Table 2, all six prospective meta-beliefs listed can support either holding negative primals or holding less positive positive primals.

The popularity of meta-beliefs favoring slightly versus distinctly positive primals is particularly interesting because, despite the surge of interest in positive psychology over the past few decades, this distinction is relatively underexamined. For example, it is now well-established that strongly negative beliefs—often so negative as to be called *illusory* such as *I am a totally worthless person*—contribute to depression (e.g., Beck, 1963, 1964, 1967, 2005; Beck et al., 1979; Butler et al., 2006; Hofmann et al., 2012). But what about negative beliefs that are not that negative and slightly positive beliefs that could be more positive? Taylor and Armor's (1996) review of the literature on positive illusions concludes that positive illusions are common and usually associated with better outcomes in the face of adversity. Setting aside the extent to which

a very positive belief is illusory or not, understanding the comparative utility of positive and very positive beliefs when neither can be considered illusory—perhaps the truth is irrelevant or, as in the case of primals, unknowable—may help clinicians and coaches design interventions. While extremely negative negative beliefs may offer the most room for improvement, sometimes those darkest beliefs may not be sufficiently malleable—perhaps the client has already tried a variety of strategies to shape the very negative belief. If so, perhaps there is value-add in targeting beliefs that are already fairly positive to make them even more positive, presuming doing so is typically not associated with negative consequences that might indicate a damaging illusory belief.

Study 2 consisted of a cross-sectional search for situations in which positive outcomes were associated with (a) negative primals versus positive primals and (b) distinctly positive primals versus somewhat positive primals. I examined correlations between 17 primals and eight outcomes among six samples with a total 4,535 unique subjects representing 48 occupations ($n \geq 30$). A total of 3,291 statistics were produced, 1,860 of which were significant. In only six of these relationships were more negative primals related to more positive outcomes. All six involved small effects and small occupationally-defined sub-samples. Thus, in 99.7% of significant relationships, more positive primals were associated with better outcomes, roughly categorized as slightly increased success and greatly increased wellbeing. Moreover, I could find no empirical justification for the popular moderation approach among the parents in Study 1. In 422 t-tests conducted in Study 2, there were 297 significant differences in outcomes between those who saw the world as somewhat positive and those who saw the world as distinctly positive. In every case, seeing the world as distinctly positive was associated with more success, more job satisfaction, better physical health, less negative emotion, less depression, not attempting suicide, more life satisfaction, and more psychological flourishing. In sum, this cross-sectional search yielded unambiguous results that replicates and extends two initial studies using the Primals Inventory as well as findings from the belief in a just world literature (Clifton et al., 2019; Stahlmann et al., 2020; e.g., Bartholomaeus & Strelan, 2019). A robust correlational

relationship exists between more negative primals and more negative outcomes, even when comparing positive beliefs to positive beliefs, and even when comparing within occupation.

If those with negative primals typically enjoy worse success and wellbeing outcomes as Study 2 demonstrates, why might meta-beliefs purporting the opposite be commonplace? I see two clues. The first lies in the diversity of primals themselves, which, like meta-beliefs, are normally distributed. One possibility is that individuals implicitly define relatively narrow bands of belief within which "reasonable" people can disagree. Then, recognizing some utility in being as positive as possible, position themselves near the upper limit of those bands. The result of positive self-positioning within normally-distributed bands of supposed reasonableness would be threefold. First, both meta-belief and primal world belief would be normally distributed (observed empirically). Second, virtually nobody would see their own primals as stubborn, totalizing, or precluding interpretive flexibility, regardless of one's position along the continuum (observed anecdotally). Third, virtually all beliefs more positive than one's own would seem inflexible and totalizing—like a Bayesian prior that refuses updating despite clear evidence—indicating a serious lack judgement on the part of others (observed anecdotally). If virtually all primal world beliefs more positive than ones own appear inflexible and totalizing, parents would of course not want to wish such beliefs on their children (now observed empirically in Study 2).

The second related clue comes from the optimism literature. Like primals, optimism correlates with many positive outcomes, yet common sense and empirical research (e.g., Foregeard & Seligman, 2012) suggest that high optimism can lead to problems in certain domains, such as when a pilot is doing a final equipment check before a flight or a gambler is doubling down on a bad bet. The proposed solution is flexibility and domain selectivity to avoid a totalizing pattern of interpretation or behavior (Seligman, 1991; Armor & Taylor, 1998). For similar reasons, individuals might believe that highly positive primals preclude flexibility and should be avoided for similar reasons. However, this may be mistaken. Primals are not behaviors, but beliefs, and, as beliefs about general character only, interpretive and behavioral flexibility is inherent. Consider, for example, common non-world beliefs such as *Jill is a liar* or *Jack is an*

extrovert. As trait claims, those holding these beliefs are not expected to believe that Jill never tells the truth or that Jack has never been quiet at a party. Instead, these beliefs inform a posture towards Jack and Jill which is readily adjustable depending on contextual information—numerous exceptions are not just allowed but expected. Likewise, primals are traits claims about the universe. They likewise do not entail totalizing thinking. After all, it is unlikely that the hundreds of Study 2 subjects who saw the world as very safe and achieved much higher wellbeing than peers while stumbling through life in a positive haze, unable to perceive, anticipate, or respond to threats. To examine this further, researchers might empirically examine whether increasingly positive primals are associated with any losses in interpretive or behavioral flexibility; there may well be substantial orthogonality between responsiveness to primal-inconsistent information and Primals Inventory scores. If this turns out to be the case, parents might best serve their children by teaching them to avoid extreme optimism while embracing extremely optimistic primals.

Interestingly, if it pays to have accurate world beliefs (i.e., meta-belief #4 in Table 2), the pattern of results in Study 2 may shed some light—curiously enough—on the nature of the world itself (and, if so, may be worth incorporating into interventions). Charnov (1976) proposed Marginal Value Theorem to describe optimal foraging strategies when food is in clusters or patches and a forager must spend time travelling between patches. He states that foragers, "should leave the patch it is presently in when the marginal capture rate in the patch drops to the average capture rate for the habitat" (p. 132). If the forager leaves too late or too early, the forager will experience diminishing returns or spend too much energy wandering the environment in search of new patches, both of which should be associated with a variety of negative consequences. Now imagine a researcher did not know the average capture rate of a habitat, but did have a way to measure both expected average capture rates and differences in forager outcomes. If so, and if Marginal Value Theorem holds, comparing creature outcomes to creature habitat beliefs would shed light on the objective conditions of the creatures' habitat. Theoretically, creatures with more accurate expectations would on average experience better outcomes.

In humans, the *average capture rate for the habitat* is the same or at least very related to the primal labeled *Abundant* (versus barren), defined as the belief that the world is a promising place full of opportunities and resources. Above studies have shown that higher *Abundant* scores are linearly tied to positive outcomes, suggesting that, seemingly no matter how high *Abundant* scores get, even higher scores are associated with improved outcomes. That may mean the world is objectively, for humans at least, an abundant place. If so, the same logic applies to other primals. For example, in very dangerous places like a war zone, it is presumably beneficial to accurately recognize the objective reality of the situation, and people who do so should on average enjoy a variety of better outcomes while in that place. But, among humans, seeing the world as dangerous is clearly associated with much worse outcomes. This may indicate that, to some degree, the world is not a very dangerous place. However, another possibility is that the world is in fact a very barren and dangerous place, but the benefits of being accurate when it comes to this unusual topic of belief are minimal compared to the psychological costs involved. If so, when it comes to beliefs about the world as a whole, it may not pay to be accurate.

Limitations

While Study 1 aimed to shed light on the prevalence of a phenomenon, the population and primals that were examined were selected precisely because that is where the phenomenon was thought to be more prevalent, greatly limiting generalizability. In Study 2, though t-tests can help establish linearity between primals and positive outcomes at the upper levels, larger samples are needed to allow comparisons between subjects with more unusually high scores. In two samples, measures of socio-economic status or personal income were used as proxies for job success and are arguably poor proxies. For Sample 1 and 2, scale administration was not concurrent, which likely dampened effect sizes. Because the current interest was identifying trends across primals, samples, and outcomes, no correction was made for multiple comparisons, which limits the generalizability of any one relationship (see above discussion). Finally, previous literature connecting *Just* to increased victim-blaming and less prosociality (e.g., Benson & Ritter, 1990; Sakallı-Uğurlu, Yalçın, & Glick, 2007) should serve as a reminder that, outside these eight

outcome variables, future research may yet find undesirable correlates of positive primals. Finally, cross-sectional results like this do not allow causal inferences. Finally, all results were self-report, which is subject to several types of error.

Concluding Remarks

In their foundational primals paper, Clifton and colleagues (2019) laid down a gauntlet by suggesting that much of the variance in most major variables psychologists study might be driven by beliefs psychologists had largely overlooked. Exploring this possibility calls for a great deal of research, especially bold experimentation to examine causation. This chapter provides an incremental step in that direction. By replicating and extending previous correlational research, I have established that the correlational relationship between positive primals and positive outcomes is robust, contrary to various suppositions concerning the value of negative primals. Indeed, despite much searching, it remains unclear if negative primals have much value. Those with more negative primals were on average slightly less successful at their jobs, substantially less satisfied with their jobs, less physically healthy, suffered more frequent negative emotions, were much more likely to be depressed, slightly more likely to have attempted suicide, were much less satisfied with their lives, and reported dramatically less psychological flourishing—even when comparing those within the same occupation. If nothing else, this research suggests that further effort examining primal world beliefs is worthwhile. In the meantime, parents might consider pausing all efforts to teach negative primals to children. It might well be a terrible idea.

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RESEARCH STATEMENT AND NARRATIVE SUMMARY

Research Statement

Behavior is influenced—sometimes dramatically—by perceptions of the basic character of one's environment. In places seen as fun, for example, people are more friendly; in places seen as dangerous, people are more alert; and so on for many pairs of perceptions and behaviors. My research explores the possibility that individuals also have numerous, widely varying, highly stable perceptions of the world as one giant place—the one place humans never leave—and that these perceptions may likewise influence many behavior patterns and wellbeing outcomes. I call these perceptions primal world beliefs ("primals").

The first step in exploring this possibility was measurement. I needed to demonstrate that individuals hold primal world beliefs, empirically map what primals individuals hold, create a tool to measure primals, and demonstrate the plausibility of the 'big idea' that primals' might shape a variety of outcomes. This five-year project was completed a year ago (the Clifton et al, 2019, article in *Psychological Assessment*), with short-form scales forthcoming and an interest in measurement methodology emerging in the process (e.g., the Clifton, 2019, *Psychological Methods* article on validity versus reliability trade-offs).

The second step has been breadth. This involves integrating primals research into the most obviously relevant literatures, especially literatures already examining primals or similar beliefs. So far, this has been done via a few short theory papers examining connections between primals and health (*Healthy in a Crummy World*, Clifton & Kim, 2020, published in *Medical Hypotheses*), wellbeing (*Happy in a Crummy World*; Clifton, 2020a, published in *The Journal of Positive Psychology*), and experiences (Chapter 2, recently published as Clifton, 2020b, in *Frontiers in Psychology*). This dissertation continues the integration process with the first empirical efforts to build on the primals framework.

The third step will be depth—moving beyond exploratory research to examine primals' causal influence on personality and wellbeing. If causality is established, Step 4 will turn towards application and how to responsibly leverage primals to address important social issues (e.g.,

depression, political cooperation). Barring some decisive breakthrough, however, I expect basic research in Steps 2 and 3 to continue for several years.

Narrative Summary

This dissertation's main contributions are threefold. First, it represents early empirical demonstrations of primal world beliefs as a worthwhile research topic. Second, it advances multiple ongoing discussions about some of the few world beliefs previously studied. Third, it takes concrete steps towards intervention design by addressing two-types of meta-beliefs (i.e., beliefs about beliefs) thought to often bolster negative primals.

Chapter 1 is an application of the primals framework to politics. Of the 26 primals humans hold, arguably only two have been studied, with one being belief in a dangerous world. This primal has been primarily studied in connection to political ideology. Based on theory, correlational research, and complementary experimental work, the consensus has been that conservatives tend to see the world as a more dangerous place, which increases conservatism, and liberals tend to see the world as safer, which increases liberalism. Chapter 1 examines 8 diverse samples (N=3,734) and finds that dangerous world belief actually explained only .9% of the variance in political ideology, placing it nearly in the middle a large group of fifteen primal world beliefs—just below the belief the world is *Funny* at 1.0%—sharing so little variance with political conservatism that they were dubbed *the primals of virtual agreement across the political spectrum*. Why was previous political research so misleading? A second study finds that the primary scale formerly used to measure belief in a dangerous world happens to highlight threats conservatives fear and neglect threats liberals fear.

Far from indicating primals' irrelevance to politics, however, this research points to the importance of new primals. Six explained considerable variance in political ideology: *Hierarchical* (15%), *Intentional* (11.5%), *Acceptable* (9.2%), *Worth Exploring* (6.9%), *Just* (5%), and *Progressing* (2.6%). Their prominence suggests an alternative pair of perceived worlds in which opposite political behaviors make sense. Conservatives see an inherently hierarchical, fair, cosmically sanctioned order to the universe that is being eroded, suggesting wisdom in

constraining change and tolerating inequality; while liberals see an inherently nonhierarchical, unfair world that is improving, suggesting wisdom in accelerating change and resisting inequality. This account—shorthanded *hierarchy theory*—is largely unrelated to fear-based political motivations and has numerous implications for topics such as contemporary political messaging, historical analysis, and the future of human cooperation.

After Chapter 1 (hopefully) demonstrates the value of the primals framework, Chapter 2's developmental question becomes more interesting and justified: where do primals come from? Specifically, what is the role of experiences in shaping primal world beliefs? On this point too some research has been conducted. Janoff-Bulman (1989) prominently suggested that trauma might powerfully shape a variety of fundamental beliefs about the self and the world, including some primal world beliefs. Her theory is one of a family of possible theories that suggest how an individual's primals might reflect an individual's background. For example, if one grows up wealthy (or poor), one may see the world as more abundant (or barren). I call this family of theories *retrospective theories*, contrasting them with *interpretive theories*. Interpretive theories hold that primals are not mirrors reflecting our backgrounds, but lenses used to interpret experiences while being largely uninfluenced by those experiences. I then identify 12 tests that would shed light on whether interpretive or retrospective theories tend to be more accurate and hypothesize in favor of interpretive theories. (My plan was to also present new data on these hypotheses but that was short-circuited by the Covid-19 pandemic).

If future research supports my guess—if primals generally do not reflect our backgrounds in a straight-forward manner—what other experiences might shape primals? This question brought me to a juncture where thousands before have stood. After introducing a construct, researchers eventually ask, *what experiences might shape my construct*? Four years ago I asked this question and searched the literature for a tool that would enable systematic theorizing about a broad range of experiences in relation to my construct. What I found instead were a handful of largely overlapping clinically-oriented checklists dominated by a particular type of involuntary, negative experiences of quick duration, such as injury or death of a family member. So, absent

the tool I sought, I made one—called the Cube Framework—which I introduce in Chapter 2 to facilitate the identification of promising areas for further primals research, but also in the hope that researchers might find it useful in other contexts. The Cube Framework identifies three dimensions by which all experiences vary—time (acute/chronic), control (internal/external), and valence (positive/negative)—permutations of which define eight experience types in which human experiences can be sorted: bad luck, bad times, bad choices, bad habits, good luck, good times, good choices, good habits. Applying this framework to primals research indicates *good times* and *good habits* might be promising areas for further research. However, I end Chapter 2 confessing skepticism that naturally occurring life experiences that reliably influence primals might be found. Instead, such experiences may have to be designed. In fact, some already have been (e.g., cognitive behavioral therapy).

Chapter 3 turns towards intervention design. What will interventions have to accomplish in order to alter negative primals? Among other things, certain meta-beliefs (i.e., beliefs about beliefs) that bolster negative primals may need to be addressed. Chapter 3 observes that meta-beliefs come in at least two types. First, *retrospective meta-beliefs* hold that our backgrounds dictate our primals, thus giving one little choice but to continue seeing the world as one does. Second, *prospective meta-beliefs* hold that one's primals are associated with success and wellbeing, and are retained therefore in the hopes that they will likely prove useful in achieving future goals. Both types of meta-beliefs deserve study for being underexamined, involving clear implications for intervention design, and for being interesting in their own right as plausible explanations of behavior. Chapter 2 has already discussed a way forward in the study of retrospective meta-beliefs (which are nothing but personal lay retrospective theories of how one's own primals developed). Thus, Chapter 3 tackles the issue of prospective meta-beliefs.

Chapter 3 identifies several perhaps common prospective meta-beliefs. For example:

- *While positive primals might make me feel better, it's a luxury I can't afford because people usually don't succeed in my job without a darker view of things.*
- *More often than not, seeing the world as this amazing place leads to disappointment with what you get, both at work and home, which can make you depressed, lose hope, and even get suicidal—best keep expectations low.*

- *Seeing the world as safe where everyone sings 'Kumbaya' leaves people vulnerable to predation, physical threat, germs, illness, and even death—you gotta stay vigilant.*

Study 1 preliminarily finds that such prospective meta-beliefs purporting the value of negative primals are not unusual. This was done by asking parents which primals they most desire to instill in their children (*N*=180). Normally distributed response patterns indicated that substantial minorities of parents (and in one case a majority) believe the best way to prepare children to navigate life is to teach them that the world is in various ways a bad place: including that that the world is full of physical threats; does not reward or punish fairly; is rarely that funny; is full of fragile situations that could easily fall apart; is cut-throat; and is getting worse. Moreover, among those who aim to teach positive primals to their children, clear majorities preferred slightly positive primals to distinctly or very positive primals. Few, in other words, thought that teaching moderately to very positive primals to children was the best way to prepare them to navigate life.

Might there be truth in these parental intuitions? Study 2 consisted of a cross-sectional search across six diverse samples representing 48 occupations (*N*=4,535) for instances in which any of eight key outcomes might be connected to either (a) more negative primals or (b) slightly less positive positive primals. This search discovered 1,860 significant relationships between the seventeen primals examined and the eight life outcomes. In 99.7% of these relationships, negative primals were associated with worse outcomes, as follows: slightly decreased job performance/success, much decreased job satisfaction, moderately decreased physical health, moderately increased suicide attempts, much increased negative emotions, greatly increased depression, greatly decreased life satisfaction, and dramatically decreased overall psychological flourishing. Given multiple samples, some large and diverse, replication, and pre-registration, there appears to be a robust correlational relationship between more negative primals and more negative outcomes, even when comparing positive beliefs to positive beliefs, and even when comparing within occupations. Such correlational findings do not indicate causation, but are useful for theory-building; for identifying promising areas for future research; for creating

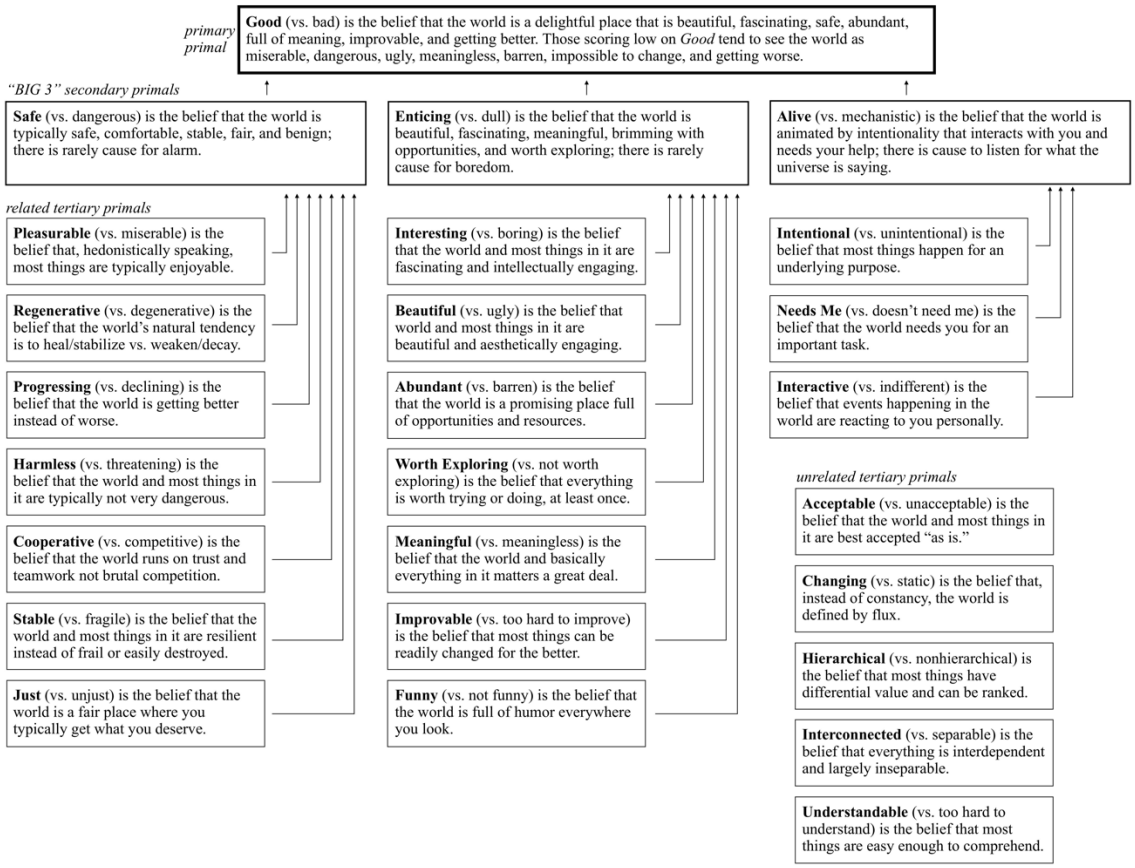
interventions designed to combat inaccurate prospective meta-beliefs, and, perhaps, for motivating the reconsideration of certain parental goals.

What are researchers to make of all this? Some findings are conclusive, with perhaps the most interesting being that political conservatives and liberals differ on the belief that the world is dangerous to an unremarkable degree. However, the value of this dissertation is not in any particular conclusion, but in the repeated discussion sections in which the primals framework is repeatedly applied to different outcomes—from politics to attempted suicide to job satisfaction to life satisfaction—and explanatory promise is seen as plain and obvious. Yet this is a small sampling of outcomes that primals might influence. Of course, for some of these outcomes—perhaps most—the explanatory promise may never bear out. Substantial covariation between primals and outcomes may be explained in a variety of ways, depending on the outcome, person, or primal. Nevertheless, I suspect that every discipline that examines human behavior or outcomes will have to one way or another eventually take primal world beliefs into account to some degree, if only to control for them. This is because of a simple reason mentioned repeatedly throughout this dissertation: behavior can be highly influenced by the perceptions of the environment in which the behavior takes place, and primals concern the environment in which all behavior takes place.

APPENDIX

Figure 1

Definitions and Structure of 26 Primal World Beliefs



Note. 26 primals (22 tertiary, 3 secondary, and 1 primals) as identified by Clifton and colleagues (2019). Figure reproduced from Clifton and Kim (2020).

Table 1

Comparing the BDW Scale to the Primals Inventory's Safe Subscale

The BDW scale 10 items; unidimensional; Perry et al, 2013	The Primals Inventory's *Safe* subscale 29 items; multidimensional; Clifton et al, 2019	
- My knowledge and experience tells me that the social world we live in is basically a safe, stable and secure place in which most people are fundamentally good.*	*Harmless*	- On the whole, the world is a safe place. - Real danger is everywhere; even if we don't notice it.* - Most things and situations are harmless and totally safe. - I tend to see the world as pretty safe. - On the whole, the world is a dangerous place.*
- It seems that every year there are fewer and fewer truly respectable people, and more and more persons with no morals at all who threaten everyone else.	*Cooperative*	- Instead of being cooperative, life is a brutal contest where you got to do whatever it takes to survive.* - For all life—from the smallest organisms, to plants, animals, and for people too—everything is a cut-throat competition.* - Instead of being cooperative, the world is a cut-throat and competitive place.*
- Although it may appear that things are constantly getting more dangerous and chaotic, it really isn't so. Every era has its problems, and a person's chances of living a safe, untroubled life are better today than ever before.*		
- Any day now chaos and anarchy could erupt around us. All the signs are pointing to it.	*Progressing*	- The world runs on trust and cooperation way more than suspicion and competition. - On the whole, the world is getting worse.* - It feels like the world is going downhill.* - Though the world has problems, on the whole things are definitely improving.
- There are many dangerous people in our society who will attack someone out of pure meanness, for no reason at all.	*Regenerative*	- It feels like the world is getting better and better. - Though sometimes situations get worse, usually they get better. - Most things have a habit of getting worse.* - The usual tendency of most things and situations is to get better, not worse.
- The ''end'' is not near. People who think that earthquakes, wars, and famines mean God might be about to destroy the world are being foolish.*		
- My knowledge and experience tells me that the social world we live in is basically a dangerous and unpredictable place, in which good, decent and moral people's values and way of life are threatened and disrupted by bad people.	*Stable*	- Over time, most situations naturally tend to get worse, not better.* - The world is a place where things are fragile and easily ruined.* - It takes a lot for things to fall apart. - Most things and situations are delicate and easily destroyed.*
- Despite what one hears about ''crime in the street,'' there probably isn't any more now than there ever has been.*	*Just*	- Most situations are delicate. Though they may be fine now, things could easily unravel.* - The world is a place where working hard and being nice pays off. - If someone is generous and kind, the world will be kind back.
- If a person takes a few sensible precautions, nothing bad is likely to happen to him or her; we do not live in a dangerous world.*	*Pleasurable*	- The world is a place where we rarely deserve what we get.* - Life offers more pain than pleasure.* - On the whole, the world is a good place. - Life in this world is usually pain and suffering.* - Life offers way more pleasure than pain. - Most things in the world are good.
- Every day as society becomes more lawless and bestial, a person's chances of being robbed, assaulted, and even murdered go up and up.		

*reverse-scored item

Table 2

Primals Inventory Descriptive Statistics for Eight Samples in Chapter 1

	Sample 1: AH.Org *N* = 773			Sample 2: YM.Org (USA) *N* = 1070			Sample 3: YM.Org (Intl.) *N* = 354			Sample 4: Immigrants *N* = 98			Sample 5: Philly Pros *N* = 80			Sample 6: Undergrads *N* = 321			Sample 7 2019 mTurk *N* = 611			Sample 8 2015 mTurk *N* = 755		
	M	*SD*	*α*	*M*	*SD*	*α*	*M*	*SD*	*α*	*M*	*SD*	*α*	*M*	*SD*	*α*	*M*	*SD*	*α*	*M*	*SD*	*α*	*M*	*SD*	*α*
Good	3.40	.64	.97	2.94	.64	.95	2.77	.68	.96	2.86	.52	.95	3.25	.55	.96	2.91	.50	.95	2.83	.66	.97	2.57	.68	.97
Safe	3.14	.77	.95	2.64	.79	.94	2.50	.82	.94	2.52	.65	.94	2.99	.67	.93	2.63	.60	.93	2.62	.76	.95	2.17	.81	.96
Pleasurable	3.49	.90	.87	2.74	1.03	.86	2.52	1.05	.86	2.76	.87	.84	3.53	.82	.82	2.95	.80	.85	2.86	.93	.86	2.66	1.01	.90
Regenerative	3.42	.82	.82	2.96	1.00	.86	2.87	1.05	.87	3.08	.78	.81	3.28	.75	.83	3.05	.77	.80	2.85	.90	.81	2.43	.91	.86
Progressing	2.86	1.09	.90	2.80	1.22	.90	2.84	1.28	.91	2.40	.89	.78	2.71	1.06	.88	2.60	.96	.87	2.54	1.07	.87	2.09	1.16	.92
Harmless	2.86	1.03	.88	2.34	1.08	.88	2.24	1.09	.88	1.92	.78	.78	2.57	1.00	.85	2.16	.78	.81	2.47	.92	.85	2.06	1.06	.91
Cooperative	3.32	1.03	.82	2.88	1.11	.83	2.70	1.15	.84	2.61	.83	.73	3.04	.93	.77	2.66	.87	.79	2.63	.98	.80	1.90	1.01	.83
Stable	2.80	.93	.77	2.22	1.09	.84	2.02	1.04	.83	2.32	.74	.71	2.63	.80	.73	2.24	.77	.79	2.34	.86	.75	1.54	.89	.82
Just	2.89	.79	.71	2.25	.99	.78	2.03	1.04	.82	2.53	.83	.77	2.90	.79	.71	2.71	.75	.74	2.57	.88	.81	2.49	.90	.82
Enticing	3.77	.62	.94	3.44	.71	.92	3.25	.77	.92	3.27	.52	.90	3.59	.56	.91	3.32	.53	.91	3.11	.72	.94	3.08	.73	.95
Interesting	3.94	.83	.84	3.47	1.04	.84	3.33	1.10	.86	3.47	.78	.80	3.62	.80	.77	3.47	.78	.78	3.21	.95	.81	2.67	.92	.84
Beautiful	3.72	.82	.80	3.29	1.03	.82	3.01	1.10	.82	3.13	.75	.71	3.42	.73	**.65**	3.18	.76	.73	3.04	.91	.78	3.13	.92	.83
Abundant	3.85	.78	.81	3.57	.93	.80	3.39	.99	.82	3.39	.67	**.65**	3.81	.72	.74	3.49	.68	.76	3.14	.90	.79	3.18	.91	.84
Worth Exploring	3.79	.71	.73	3.76	.92	.78	3.66	1.00	.81	3.20	.75	.72	3.60	.79	.78	3.48	.69	**.69**	3.16	.83	.74	3.20	.83	.80
Meaningful	3.94	.89	.81	3.11	1.34	.87	2.85	1.40	.88	3.59	.85	.82	3.84	.86	.81	3.47	.89	.83	3.24	1.08	.84	2.78	1.01	.86
Improvable	3.54	.76	.78	3.32	.91	.79	3.22	.87	.73	3.03	.68	**.67**	3.46	.63	**.69**	3.07	.65	.73	3.01	.78	.77	2.94	.82	.81
Funny	3.32	.95	.86	3.26	1.19	.90	3.00	1.22	.90	2.81	.88	.79	3.09	.92	.81	2.83	.86	.82	2.77	.96	.81	2.84	1.06	.90
Alive	2.82	.75	.85	1.87	1.01	.89	1.77	1.04	.91	2.99	.59	.80	2.61	.85	.89	2.68	.70	.85	2.48	.79	.88	2.18	.88	.91
Intentional	2.84	1.11	.85	1.64	1.40	.90	1.50	1.38	.90	3.18	.84	.79	2.49	1.13	.84	2.67	1.00	.85	2.51	1.00	.82	2.08	1.14	.88
Needs Me	3.47	1.08	.90	2.22	1.45	.91	2.03	1.42	.89	3.30	.96	.89	3.47	1.15	.91	2.90	1.09	.90	2.66	1.13	.87	2.51	1.20	.91
Interactive	2.14	.91	.82	1.76	1.03	.86	1.84	1.07	.88	2.41	.86	.82	1.83	.85	.86	2.45	.79	.83	2.19	.80	.76	1.83	.91	.85
Other tertiary primals																								
Acceptable	1.73	.83	.75	1.43	1.00	.85	1.29	.96	.84	1.53	.76	.82	1.44	.73	.76	1.44	.70	.79	1.85	.84	.76	.97	.86	.83
Changing	3.17	.74	.74	3.04	.95	.85	3.12	.96	.87	3.25	.64	.76	2.94	.76	.77	3.18	.71	.82	2.97	.74	.76	2.92	.72	.80
Hierarchical	1.96	.94	.76	2.17	1.25	.86	2.26	1.21	.83	2.32	.82	.72	2.25	.87	.73	2.36	.88	.81	2.42	.82	.73	2.22	.88	.77
Interconnected	3.52	.88	.81	3.12	1.25	.89	3.09	1.23	.88	3.25	.76	.82	2.66	.92	.78	3.05	.74	.72	2.88	.89	.79	2.83	1.00	.87
Understandable	2.97	.94	.80	2.62	1.11	.82	2.46	1.17	.84	2.22	.88	.79	2.88	.87	.77	2.13	.82	.74	2.59	.91	.75	2.16	.91	.79

Note. Bolded *α* values indicate five instances where *α*<.70. *M* = mean. *SD* = standard deviation. *α* = standardized Cronbach's *α*.

Table 3

Primals Relationship to Political Ideology for Eight Samples in Chapter 1

Primal	Mean % Variance Explained[m] N=3,333		Sample 1: AH.Org *N*=773		Sample 2: YM.Org US *N*=1070		Sample 3: YM.Org Intl. *N*=354		Sample 4: Immigrants *N*=98		Sample 5: Philly Pros[m] *N*=80		Sample 6: Undergrads[m] *N*=321		Sample 7: 2019 mTurk *N*=611		Sample 8: 2015 mTurk *N*=755	
	%	95% CI	*r*	%	*r*	%	*r*	%	*r*	%	*r*	%	*r*	%	*r*	%	*r*	%
1. **Hierarchical**	**15.0(+)**	**[7.0, 23.0]**	**.17*** **	**7.0**	**.36*** **	**28.4**	**.38*** **	**31.5**	**.16***	**6.1**	**.04[n.s.]**	**.5**	**.13****	**4.2**	**.17*** **	**7.2**	**.21*** **	**10.1**
2. Intentional	11.5(+)	[6.3, 16.7]	.14***	4.6	.29***	19.8	.31***	22.2	.16*	6.4	.17[n.s.]	6.8	.18***	7.5	.21***	10.6	.17***	7.1
3. Acceptable	9.2(+)	[2.3, 16.0]	.02[n.s.]	.1	.30***	20.2	.31***	22.2	.18*	8.1	.46***	44.1	.14**	4.6	.19***	8.7	.10***	2.3
4. Alive (secondary)	7.9(+)	[3.9, 11.8]	.10***	2.6	.24***	13.7	.27***	16.9	.08[n.s.]	1.4	.17[n.s.]	7.0	.19***	8.9	.16***	6.5	.15***	5.6
5. Worth Exploring	6.9(-)	[3.3, 10.4]	-.10***	2.5	-.23***	12.1	-.26***	15.7	-.07[n.s.]	1.1	.00[n.s.]	.0	.02[n.s.]	.1	-.15***	5.3	-.14***	4.5
6. Just	5.0(+)	[1.9, 8.2]	.07*	1.1	.18***	7.8	.22***	11.8	.02[n.s.]	.1	.28**	18.2	.16***	6.2	.19***	8.6	.07**	1.3
7. Interconnected	3.5(-)	[1.9, 5.0]	-.11***	2.7	-.14***	4.9	-.08[n.s.]	1.7	-.16*	6.0	-.01[n.s.]	.0	.04[n.s.]	.4	-.0[n.s.]	.3	-.15***	5.4
8. Needs Me	2.7(+)	[.9, 4.4]	.03[n.s.]	.2	.13***	4.1	.18***	8.1	-.05[n.s.]	.7	.12[n.s.]	3.6	.16***	5.8	.11***	3.1	.08**	1.7
9. Progressing	2.6(-)	[-.7, 6.0]	-.07**	1.2	-.03[n.s.]	.2	.05[n.s.]	.7	-.07[n.s.]	1.2	.20*	9.6	.10*	2.5	.03[n.s.]	.2	-.21***	10.3
10. Cooperative	2.1(-)	[.7, 3.5]	-.09***	2.0	-.12***	3.4	-.16***	6.3	-.03[n.s.]	.2	.07[n.s.]	1.1	-.03[n.s.]	.2	.01[n.s.]	.0	-.07**	1.3
11. Harmless	2.0(-)	[1.0, 3.0]	-.10***	2.4	-.12***	3.4	-.12**	3.5	-.07[n.s.]	1.4	.11[n.s.]	3.1	.07[n.s.]	1.2	.02[n.s.]	.1	-.08**	1.5
12. Beautiful	1.5(-)	[.7, 2.2]	-.10***	2.5	-.09***	2.0	-.04[n.s.]	.3	-.02[n.s.]	.1	.04[n.s.]	.3	.08[n.s.]	1.8	-.01[n.s.]	.0	-.08**	1.5
13. Interactive	1.4(+)	[.3, 2.6]	.02[n.s.]	.1	.08**	1.7	.16***	5.9	.01[n.s.]	.0	.14[n.s.]	4.6	.05[n.s.]	.6	.06*	.8	.08**	1.7
14. Changing	1.3(-)	[.6, 2.1]	-.05*	.7	-.09***	2.2	-.07[n.s.]	1.1	-.12[n.s.]	3.4	-.20*	9.9	-.09[n.s.]	1.8	-.09**	2.2	-.02[n.s.]	.1
15. Meaningful	1.1(+)	[-.1, 2.4]	-.01[n.s.]	.0	.10***	2.5	.15**	5.3	.02[n.s.]	.1	.15[n.s.]	5.4	.12*	3.3	.03[n.s.]	.3	.03[n.s.]	.2
16. Funny	1.0(-)	[.4, 1.5]	-.08**	1.6	-.04[n.s.]	.3	-.10*	2.4	-.04[n.s.]	.3	.03[n.s.]	.2	.12**	3.4	-.03[n.s.]	.3	-.07**	1.2
17. **Safe (secondary)**	**.9(-)**	**[.3, 1.5]**	**-.07***	**1.1**	**-.07****	**1.0**	**-.06[n.s.]**	**1.0**	**-.06[n.s.]**	**.9**	**.20***	**9.1**	**.09***	**2.0**	**.05[n.s.]**	**.6**	**-.08****	**1.7**
18. Enticing (secondary)	.8(-)	[.5, 1.1]	-.07**	1.2	-.05[n.s.]	.6	-.04[n.s.]	.4	-.04[n.s.]	.4	.07[n.s.]	1.3	.10*	2.6	-.04[n.s.]	.4	-.07**	1.2
19. Regenerative	.7(-)	[.2, 1.1]	-.04[n.s.]	.3	-.06*	.8	-.05[n.s.]	.5	-.01[n.s.]	.0	.15[n.s.]	5.8	.03[n.s.]	.3	.01[n.s.]	.0	-.08**	1.5
20. Interesting	.6(-)	[.3, 1.0]	-.05[n.s.]	.6	-.04[n.s.]	.5	-.05[n.s.]	.5	-.03[n.s.]	.2	.00[n.s.]	.0	.02[n.s.]	.1	-.02[n.s.]	.1	-.07**	1.3
21. Pleasurable	.5(-)	[.1, .9]	-.03[n.s.]	.2	-.05*	.7	-.03[n.s.]	.3	-.05[n.s.]	.6	.15[n.s.]	5.2	.12**	3.7	.03[n.s.]	.2	-.07**	1.2
22. Improvable	.4(-)	[-.1, .9]	-.02[n.s.]	.1	-.02[n.s.]	.1	.01[n.s.]	.0	-.01[n.s.]	.0	.07[n.s.]	1.3	.07[n.s.]	1.2	-.01[n.s.]	.0	-.08**	1.6
23. Good (primary)	.4(-)	[.1, .7]	-.05[n.s.]	.6	-.02[n.s.]	.1	-.01[n.s.]	.0	-.04[n.s.]	.5	.19*	8.3	.13**	3.8	.02[n.s.]	.1	-.06*	1.0
24. Stable	.2(+)	[-.6, .1.1]	-.03[n.s.]	.2	-.00[n.s.]	.0	-.08[n.s.]	1.5	-.03[n.s.]	.2	.15[n.s.]	5.7	.05[n.s.]	.5	.10***	2.3	.01[n.s.]	.0
25. Abundant	.2(+)	[.0, .4]	.01[n.s.]	.0	.05*	.6	.04[n.s.]	.4	.01[n.s.]	.0	.07[n.s.]	1.2	.09[n.s.]	1.9	.01[n.s.]	.1	-.00[n.s.]	.0
26. Understandable	.0(+)	[-.1, .2]	-.02[n.s.]	.1	.03[n.s.]	.3	-.01[n.s.]	.0	-.03[n.s.]	.2	.24*	13.1	.05[n.s.]	.6	.03[n.s.]	.2	-.03[n.s.]	.2

[n.s.]Not significant *p<.05 **p<.01 ***p<.001 [m]Sample-weighted mean % of variance explained, accounting for direction of relationships, and excluding samples 5 and 6 for using party as a proxy measure for political ideology. r^2 is derived from Kendall's τ b. Confidence intervals calculated using sample-weighted standard deviations. + or – in parentheses indicates mean direction of relationship.

Table 4

Descriptive Statistics for Additional Measures in Chapter 1

Measure	*611 mTurkers*				*YourMorals.Org Subjects*				
	Mean	*SD*	*Range*	*α*	*n*	*Mean*	*SD*	*Range*	*α*
Care	3.59	.82	0-5	.73	1278	3.25	.98	0-5.00	.78
Fairness	3.55	.78	.17-5	.70	1276	3.42	.79	.17-5.00	.66
Loyalty	2.60	.99	0-5	.79	1277	2.07	1.00	0-5.00	.78
Authority	2.83	.95	0-5	.78	1286	2.20	1.03	0-5.00	.79
Sanctity	2.58	1.23	0-5	.87	1283	1.60	1.21	0-5.00	.86
Right Wing Authoritarianism	1.94	.99	0-4.53	.91	845	1.36	.95	0-4.93	.90
Social Dominance Orientation	1.57	1.12	0-4.87	.94	494	1.89	1.42	0-6.33	.94
Belief in a Dangerous World	2.34	.92	0-5	.87	NA	NA	NA	NA	NA
Conservatism	2.53	1.83	0-6	NA	1460	2.06	1.17	0-6.00	NA

Note. The Belief in a Dangerous World scale was not available to YourMorals.Org subjects and conservatism was measured via a 1-item scale.

Table 5

Duplicating the Relationships Between Primals and the BDW scale

Primals	Pairwise r with BDW, Study 5 (Clifton et al., 2019) 122 mTurkers	Pairwise r with BDW, Study 2 611 mTurkers	Difference sig. calculated via 2-tailed Fisher r-to-z transformation
Good	-.58***	-.60***	-.02
Safe	-.68***	-.67***	.01
Pleasurable	-.49***	-.54***	-.05
Regenerative	-.53***	-.54***	-.01
Progressing	-.72***	-.66***	.06
Harmless	-.67***	-.67***	.00
Cooperative	-.59***	-.52***	.06
Stable	-.39***	-.41***	-.02
Just	-.34***	-.30***	.04
Enticing	-.40***	-.46***	-.06
Interesting	-.22*	-.32***	-.10
Beautiful	-.47***	-.40***	.07
Abundant	-.40***	-.42***	-.02
Worth Exploring	-.32***	-.43***	-.11
Meaningful	-.15	-.22***	-.07
Improvable	-.46***	-.44***	.02
Funny	-.40***	-.43***	-.03
Alive	-.16	-.03	.13
Intentional	-.13	.08*	.21*
Needs Me	-.19*	-.13**	.06
Interactive	-.01	.02	.03
Other tertiary primals			
Acceptable	-.16	.02	.18
Changing	.19*	.17***	-.02
Hierarchical	.26**	.21***	-.05
Interconnected	-.19*	-.13**	.06
Understandable	-.34***	-.41***	-.07

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

Table 6

Pairwise rs Between Key Primals and Major Correlates of Conservatism among 611 mTurkers

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Hierarchical (1)	1															
Intentional (2)	.20***	1														
Acceptable (3)	.15***	.24***	1													
Worth Exploring (4)	-.23***	.07	-.28***	1												
Just (5)	.17***	.56***	.27***	.12**	1											
Progressing (6)	-.02	.25***	.19***	.26***	.52***	1										
Care (7)	-.19***	.11**	-.24***	.24***	.04	-.05	1									
Fairness (8)	-.18***	-.16***	-.35***	.22***	-.20***	-.10*	.60***	1								
Loyalty (9)	.28***	.37***	.36***	-.22***	.36***	.10*	.15***	-.02	1							
Authority (10)	.37***	.46***	.33***	-.25***	.35***	-.02	.12**	-.03	.76***	1						
Purity (11)	.34***	.48***	.29***	-.28***	.30***	-.07	.11**	-.07	.65***	.75***	1					
RWA (12)	.39***	.46***	.38***	-.37***	.28***	-.09*	-.18***	-.37	.57***	.68***	.72***	1				
SDO (13)	.32***	.14***	.50***	-.41***	.17***	.02	-.43***	-.54***	.35***	.38***	.37***	.58***	1			
BDW (14)	.21***	.08*	.02	-.43***	-.30***	-.66***	-.02	-.06	.18***	.31***	.37***	.44***	.22***	1		
Safe (15)	-.05	.38***	.17***	.36***	.72***	.79***	.06	-.10*	.13**	.05	.00	-.03	-.05	-.67***	1	
Conservatism^{T} (16)	.27***	.33***	.30***	-.23***	.29***	.04	-.25***	-.40***	.39***	.48***	.46***	.62***	.51***	.20***	.08	1

Note. *p<.05 **p<.01 ***p<.001. Measures 1-6 constitute the main primals of Hierarchy Theory. Measures 7-11 are the five subscales of the Moral Foundations Questionnaire. Measure 12 is Right-Wing Authoritarianism. Measure 13 is Social Dominance Orientation. Measure 14 is Perry and colleagues (2013) Belief in a Dangerous World scale. Measure 15 is the PI-99's *Safe* subscale. Measure 16 is the 1-item political ideology measure. ^{T}Unlike the other results in this table, conservatism's relationships were assessed using Kendall's *τ* b and then computed into Pearson's *r*.

Table 7

Pairwise rs Between Key Primals and Major Correlates of Conservatism among YM.Org Subjects

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Hierarchical (1)	1 n=1424													
Intentional (2)	.15*** n=1424	1 n=1424												
Acceptable (3)	.16*** n=1424	.23*** n=1424	1 n=1424											
Worth Exploring (4)	-.31*** n=1424	-.09*** n=1424	-.21*** n=1424	1 n=1424										
Just (5)	.09*** n=1424	.43*** n=1424	.20*** n=1424	.04 n=1424	1 n=1424									
Progressing (6)	-.08** n=1424	-.07** n=1424	-.02 n=1424	.21*** n=1424	.28*** n=1424	1 n=1424								
Care (7)	-.41*** n=973	-.04 n=973	-.23*** n=973	.29*** n=973	-.04 n=973	-.02 n=973	1 n=1278							
Fairness (8)	-.25*** n=969	-.18*** n=969	-.28*** n=969	.23*** n=969	-.14*** n=969	-.02 n=969	.56*** n=1258	1 n=1276						
Loyalty (9)	.36*** n=978	.37*** n=978	.27*** n=978	-.17*** n=978	.30*** n=978	-.01 n=978	-.10*** n=1256	-.20*** n=1254	1 n=1277					
Authority (10)	.41*** n=980	.43*** n=980	.33*** n=980	-.27*** n=980	.33*** n=980	-.04 n=980	-.18*** n=1264	-.26*** n=1263	.71*** n=1263	1 n=1286				
Purity (11)	.37*** n=978	.64*** n=978	.25*** n=978	-.28*** n=978	.29*** n=978	-.17*** n=978	-.06* n=1260	-.20*** n=1259	.57*** n=1260	.66*** n=1268	1 n=1283			
Right Wing Authoritarianism (12)	.53*** n=656	.55*** n=656	.38*** n=656	-.36*** n=656	.29*** n=656	-.19*** n=656	-.37*** n=705	-.40*** n=704	.62*** n=703	.70*** n=707	.74*** n=706	1 n=845		
Social Dominance Orientation (13)	.58*** n=386	.33*** n=386	.38*** n=386	-.40*** n=386	.27*** n=386	-.04 n=386	-.61*** n=404	-.61*** n=403	.48*** n=401	.54*** n=403	.44*** n=405	.70*** n=403	1 n=494	
Conservatism[T] (14)	.54*** n=1096	.45*** n=1096	.45*** n=1096	-.36*** n=1096	.29*** n=1096	-.02 n=1096	-.51*** n=958	-.54*** n=958	.58*** n=962	.67*** n=967	.63*** n=967	.79*** n=616	.73*** n=355	1 n=1460

Note. *p<.05 **p<.01 ***p<.001. Measures 1-6 constitute the main primals of Hierarchy Theory. Measures 7-11 are the five subscales of the Moral Foundations Questionnaire. Measure 14 is the 1-item political ideology measure. [T]Unlike the other results in this table, Conservatism's relationships were assessed using Kendall's τ b and then computed into Pearson's *r*.

Table 8

Twelve Linear Models Exploring Where Hierarchy Theory Fits Within the Nomological Net

Model	Predictors	DV	*df*	r^2
1: Correlates of Political Ideology (mTurk)	Care Fairness* Loyalty Authority Sanctity RWA*** SDO**	Conservatism	603	35.4%
2: Significant Predictors from Model 1 (mTurk)	Fairness* RWA*** SDO***	Conservatism	607	35.4%
3: Main Predictors from Model 1 (mTurk)	RWA*** SDO***	Conservatism	608	35.0%
4: Hierarchy Theory (mTurk)	Hierarchical*** Intentional*** Acceptable** Worth Exploring*** Just*** Progressing*	Conservatism	604	19.3%
4: Hierarchy Theory (YourMorals.Org)	Hierarchical*** Intentional*** Acceptable** Worth Exploring*** Just* Progressing	Conservatism	1089	43.2%
5: All 26 Primals (mTurk)	Just** Alive*** Intentional*** Needs Me*** Interactive** Acceptable** Hierarchical*** (no other significant primals)	Conservatism	584	21.5%
5: All 26 Primals (YourMorals.Org	Alive* Intentional*** Acceptable*** Hierarchical*** Interconnected*** Changing* (no other significant primals)	Conservatism	1069	47.2%
6: Model 2 & Hierarchy Theory (mTurk)	Fairness RWA*** SDO*** Hierarchical Intentional Acceptable Worth Exploring Just* Progressing	Conservatism	601	36.1%
7: Hierarchy Theory Predicting RWA (mTurk	Hierarchical*** Intentional*** Acceptable*** Worth Exploring*** Just** Progressing***	RWA	604	46.8%
7: Hierarchy Theory Predicting RWA (YourMorals.Org)	Hierarchical*** Intentional*** Acceptable*** Worth Exploring*** Just* Progressing**	RWA	649	51.6%
8:Moral Foundations Predicting Conservatism	Care* Fairness*** Loyalty Authority*** Sanctity***	Conservatism	605	29.0%
9: Moral Foundations Predicting RWA	Care*** Fairness*** Loyalty Authority*** Sanctity***	RWA	605	67.7%
10: Safe (mTurk	Safe*	Conservatism		.6%
10: Safe (YourMorals.Org)	Safe***	Conservatism	1094	1.0%
11: Safe's Seven Tertiary Primals (mTurk)	Pleasurable Regenerative Progressing Harmless Cooperative Stable* Just***	Conservatism	603	10.6%
11: Safe's Seven Tertiary Primals (YourMorals.Org)	Pleasurable Regenerative** Progressing Harmless*** Cooperative*** Stable* Just***	Conservatism	1088	15.5%
12: Just only (mTurk)	Just***	Conservatism	609	7.4%
12: Just only (YourMorals.Org)	Just***	Conservatism	1094	6.1%

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

Figure 2

The Great Chain of Being by Fray Diego de Valades (1579)

Table 9

Descriptive Statistics for the Primals Inventory for Six Samples in Chapter 3

	Sample 1: AH.org *N*=3,925			Sample 2: YM.org *N*=1,843			Sample 3: mTurk *N*=692			Sample 4: Immigrants *N*=98			Sample 5: Philly Pros *N*=110			Sample 6: Undergrads *N*=473			Sample-weighted mean *N*=7,025		
	M	*SD*	*α*	*M*	*SD*	*α*	*M*	*SD*	*α*	*M*	*SD*	*α*	*M*	*SD*	*α*	*M*	*SD*	*α*	*M*	*SD*	*α*
Good	3.31	.60	.96	2.86	.66	.95	2.91	.65	.96	2.90	.52	.95	3.18	.62	.96	2.93	.52	.95	3.13	.61	.96
Safe	2.97	.77	.94	2.58	.80	.93	2.61	.73	.93	2.52	.65	.93	2.91	.72	.94	2.63	.61	.93	2.81	.76	.94
Pleasurable	3.38	.90	.84	2.63	1.05	.85	2.93	.93	.79	2.81	.88	.83	3.45	.88	.84	2.99	.84	.85	3.12	.93	.84
Regenerative	3.36	.85	.79	2.90	1.02	.84	2.86	.87	**.68**	3.08	.78	.78	3.18	.83	.77	3.05	.76	.79	3.17	.88	.79
Progressing	2.79	1.11	.89	2.79	1.24	.90	2.53	1.05	.82	2.40	.89	.76	2.69	1.08	.88	2.64	.97	.88	2.75	1.12	.88
Harmless	2.68	1.08	.87	2.28	1.08	.87	2.45	.95	.81	1.97	.79	.74	2.52	1.01	.84	2.18	.81	.83	2.51	1.04	.86
Cooperative	3.06	1.08	.80	2.83	1.13	.81	2.52	1.01	.76	2.49	.86	**.69**	2.91	.97	.77	2.60	.86	.76	2.91	1.06	.79
Stable	2.43	1.00	.79	2.18	1.09	.83	2.18	.82	**.65**	2.21	.76	.70	2.50	.93	.77	2.15	.79	.78	2.33	.99	.78
Just	2.80	.92	.75	2.13	1.05	.80	2.78	.95	.78	2.67	.89	.78	2.86	.87	.69	2.81	.80	.75	2.63	.95	.76
Enticing	3.82	.59	.92	3.35	.76	.92	3.28	.71	.93	3.35	.55	.90	3.52	.62	.92	3.37	.57	.92	3.61	.64	.92
Interesting	3.85	.86	.82	3.46	1.06	.84	3.18	1.00	.78	3.35	.80	.79	3.55	.83	.77	3.41	.78	.79	3.64	.91	.82
Beautiful	3.80	.79	.75	3.14	1.09	.82	3.25	.91	.73	3.24	.78	**.67**	3.33	.86	**.68**	3.23	.81	.73	3.53	.88	.76
Abundant	3.90	.76	.75	3.48	.99	.81	3.36	.91	.74	3.50	.71	**.67**	3.77	.74	.76	3.58	.71	.77	3.71	.83	.76
Worth Exploring	4.02	.70	.73	3.68	.96	.79	3.33	.84	**.68**	3.31	.74	**.67**	3.56	.79	**.68**	3.55	.74	**.70**	3.82	.78	.73
Meaningful	3.57	1.08	.83	3.06	1.34	.86	3.28	1.09	.80	3.48	.84	.77	3.69	.92	.79	3.35	.92	.82	3.40	1.13	.83
Improvable	3.66	.72	.73	3.24	.94	.78	3.20	.81	.76	3.17	.75	.71	3.45	.75	.72	3.16	.70	.73	3.47	.78	.75
Funny	3.45	.98	.86	3.18	1.22	.89	2.93	1.01	.79	2.92	.92	.77	2.98	1.05	.85	2.90	.92	.83	3.28	1.04	.86
Alive	2.65	.94	.90	1.82	1.05	.90	2.66	.86	.88	3.08	.63	.82	2.58	.98	.91	2.74	.76	.87	2.46	.95	.89
Intentional	2.53	1.32	.89	1.59	1.41	.90	2.61	1.05	.79	3.23	.84	.77	2.43	1.19	.84	2.68	1.01	.84	2.33	1.28	.87
Needs Me	3.28	1.19	.89	2.13	1.47	.90	2.93	1.14	.84	3.42	1.00	.89	3.34	1.29	.92	2.99	1.11	.90	2.95	1.25	.89
Interactive	2.12	1.05	.87	1.75	1.10	.87	2.37	.96	.77	2.54	.91	.82	1.91	1.01	.86	2.51	.83	.83	2.08	1.04	.86
Other tertiary primals																					
Acceptable	1.32	.80	.78	1.44	1.02	.85	1.71	.84	**.69**	1.42	.78	.81	1.45	.78	.74	1.43	.73	.79	1.40	.85	.79
Changing	3.43	.78	.80	3.02	1.00	.85	3.15	.77	.71	3.39	.69	.76	3.00	.84	.78	3.30	.73	.82	3.29	.83	.80
Hierarchical	2.23	1.09	.81	2.21	1.28	.85	2.51	.96	.77	2.45	.88	.74	2.35	.97	.75	2.43	.91	.81	2.27	1.10	.82
Interconnected	3.62	.97	.82	3.06	1.28	.89	3.01	.96	.77	3.36	.80	.79	2.68	.98	.75	3.13	.81	.75	3.37	1.03	.83
Understandable	2.68	.95	.71	2.57	1.13	.81	2.61	.87	**.61**	2.22	.88	.77	2.81	.91	.73	2.11	.81	.72	2.61	.98	.73

Note. Bolded *α* values indicates instances where *α*<.70. *M* indicates mean. *SD* indicates standard deviation. *α* indicates standardized Cronbach's *α*. Range for primals is 0-5.

Table 10

Descriptive Statistics for Additional Measures for Six Samples in Chapter 3

	Range	Sample 1: *AH.Org*				Sample 2: YM.org				Sample 3: mTurk				Sample 4: Immigrants				Sample 5: Philly Pros				Sample 6: Undergrads			
		n	*M*	*SD*	*α*	*n*	*M*	*SD*	*α*	*n*	*M*	*SD*	*α*	*n*	*M*	*SD*	*α*	*n*	*M*	*SD*	*α*	*n*	*M*	*SD*	*α*
Job Success	*na*	*na*	*na*	*na*	*na*	1639	6.08	1.87	*na*	476	51125	59087	*na*	*na*	*na*	*na*	*na*	98	.46	.27	*na*	426	233	70	*na*
Job Satisfaction	1-5	*na*	*na*	*na*	*na*	*na*	*na*	*na*	*na*	*na*	*na*	*na*	*na*	*na*	*na*	*na*	*na*	110	3.79	.90	.94	473	3.47	.82	.92
Depression	1-4	1291	1.77	.61	.93	*na*	*na*	*na*	*na*	692	1.77	.80	.94	*na*	*na*	*na*	*na*	*na*	*na*	*na*	*na*	473	1.65	.56	.88
Suicide	*na*	*na*	*na*	*na*	*na*	*na*	*na*	*na*	*na*	*na*	*na*	*na*	*na*	*na*	*na*	*na*	*na*	110	1.35	.70	*na*	473	1.60	.78	*na*
Life Satisfaction	1-7	1072	4.94	1.35	.88	328	3.94	1.54	.89	692	4.57	1.58	.93	98	4.49	1.30	.85	110	4.90	1.25	.87	473	4.69	1.27	.87
Positive Emotion	1-11	1118	8.33	1.86	.87	*na*	*na*	*na*	*na*	692	7.65	2.21	.91	98	7.63	1.56	.82	110	8.05	1.78	.88	473	7.64	1.66	.88
Engagement	1-11	1118	8.64	1.60	**.69**	*na*	*na*	*na*	*na*	692	7.77	1.70	**.69**	*na*	*na*	*na*	*na*	110	8.47	1.54	**.68**	473	7.88	1.49	**.68**
Relationship	1-11	1118	8.26	2.09	.82	*na*	*na*	*na*	*na*	692	7.94	2.27	.88	98	8.01	1.75	.77	110	8.36	2.08	.81	473	7.97	1.84	.81
Meaning	1-11	1118	8.57	2.04	.90	*na*	*na*	*na*	*na*	692	7.79	2.32	.91	*na*	*na*	*na*	*na*	110	8.67	1.76	.84	473	7.72	1.72	.84
Accomplishment	1-11	1118	8.73	1.70	.81	*na*	*na*	*na*	*na*	692	7.91	1.99	.85	*na*	*na*	*na*	*na*	110	8.77	1.23	.78	473	7.89	1.44	.78
Overall Flourishing	1-11	1118	8.51	1.59	.94	*na*	*na*	*na*	*na*	692	7.81	1.89	.96	*na*	*na*	*na*	*na*	110	8.46	1.46	.93	473	7.82	1.35	.93
Health	1-11	1118	8.11	2.26	.92	*na*	*na*	*na*	*na*	692	7.65	2.26	.93	*na*	*na*	*na*	*na*	110	8.09	2.13	.91	473	7.77	2.00	.91
Negative Emotion	1-11	1118	5.40	2.23	.77	*na*	*na*	*na*	*na*	692	5.19	2.34	.84	98	5.53	1.82	.73	110	5.38	2.06	**.67**	473	5.90	1.67	**.67**

Note. Bolded *α* values indicate instances where *α*<.70. *M* indicates mean. *SD* indicates standard deviation. *α* indicates standardized Cronbach's *α*. *na* indicates not applicable