Providing the Scientific Backbone for Positive Psychology: A Multi-Level Conception of Human Thriving

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Abstract

This article begins with a consideration of what is missing in positive psychology – namely, an integrative framework within which to view the entire person, especially as nested within more-or-less supportive social contexts and cultures. Thus, I presented a multi-level hierarchical framework for considering and explaining human behavior, arguing that all levels of the framework are necessary for complete exposition. From this point of view, personality processes cannot be reduced to "mere" cognitive processes; there are trans-cognitive rules and laws operating at this higher level. I also considered a four-level sub-framework *within* the personality level of analysis, consisting of organismic needs/characteristics, traits/dispositions, goals/intentions, and self/self-narratives. I contended that each of these spheres of the person operates via unique rules and regularities, processes that cannot be reduced to lower levels of analysis (such as biological, neurological, and cognitive levels of analysis). Finally, I described some recent research that simultaneously examines factors at multiple levels of the SLOPIC model, showing that each has influence for predicting SWB, and moreover, that all of these effects are mediated by basic need-satisfaction. Hopefully this line of research will prove useful for other positive psychologists seeking "the big picture" on human flourishing.

Keywords: Psychological needs, personality structure, positive psychology, subjective well-being

Positive Psychology Needs as an Integrative Framework

Positive psychology is the study of positive human strengths, traits, motives, virtues, and behavior, with the avowed goal of understanding how to optimize these qualities in peoples' lives (Peterson, & Park, 2009; Seligman & Csikszentmihalyi, 2000; Sheldon & King, 2001). Since its inception in the late 1990s positive

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psychology has evoked much attention, within research psychology and within world media as well. Typical positive psychology topics and themes concern gratitude, forgiveness, cooperation, relationship satisfaction, organizational citizenship, basic virtues and strengths, and also the experiences of savoring, flow, intrinsic motivation, and happiness. Despite this explosion of research, criticisms of the field remain (for example, see the October 2008 issue of *Theory and Psychology*, containing several critiques of the field). Perhaps it is time to "take stock and move forward," as we attempt to "design the future of positive psychology" (Sheldon, Kashdan, & Steger, in press)?

In this article I suggest that a major stumbling block for the field is the lack of a unifying framework within which to conceptualize optimal functioning. In one sense, positive psychology is just a "grab-bag" or "smorgasbord" of phenomena and topics. But how are all these many different topics and phenomena integrated into a single unified reality? That is what seems to be missing from the field. Without some kind of broad, systems-theoretical view of the person-in-context, it will be impossible to derive more abstract understandings of optimal positive functioning (OPF). By OPF I mean, the capacity of some people to function at a consistently high level, creating noteworthy ways of living and noteworthy life-products while aiding and even inspiring those around them.

In order to address this issue I will first summarize the hierarchical model of optimal functioning that I introduced in my 2004 book, "Optimal human being: An integrated multi-level perspective" (Sheldon, 2004, 2007, 2008). The model provides a way of thinking about all possible causes of behavior and experience within a single integrative framework. It also provides a way to develop complex multi-level models of a given behavior, models which recognize the fact that our minds and personalities are the emergent products of simpler processes nested inside of us, but are also nested inside of broader social groups and collectives.

I will then show what positive psychology research seems to prescribe for optimal functioning, at each of the levels of analysis within the model. Although there is a confusing proliferation of possible prescriptions, the hierarchical research framework presented also provides a way of achieving parsimony and of determining which prescriptions have the most merit. The framework also postulates just a few universal and evolved human needs at a "foundational" level of personality, needs that are built into everyone and whose satisfaction determines thriving in everyone. From this perspective, optimal personality characteristics, social contexts, interpersonal relationships, organizational structures, cultural styles, and forms of government are those which best satisfy psychological needs. In turn, psychological need-satisfaction predicts the wide variety of outcomes that positive psychology is interested in (such as happiness and well-being, but also including achievement, generosity, virtue, and the like). This idea of "needs as the ultimate arbiters" of optimality will be developed further, later in this article.

A Multi-Level Framework for Viewing the Person in Context

Again, to understand optimal functioning, it is necessary to briefly consider the many levels of influence upon human behavior, and also the relation of the various human sciences to each other. Figure 1 provides such a global context, using a multi-level hierarchical framework. The framework is offered in the spirit of achieving greater consilience both within psychology (Wilson, 1998), and also between psychology and the other social and natural sciences.

Figure 1. Potential Influences on Human Behavior

Level of Analysis:	Science that Studies it:
Culture	Sociology, Anthropology
↑↓	
Social Interaction	Social Psychology
↑↓	
Personality	Personality/Clinical Psychology
↑↓	
Cognition	Cognitive Psychology
↑↓	
Brain/Nervous System	Neuroscience
↑↓	
Organ Tissues	Medicine, Biology
↑↓	
Cells	Microbiology
↑↓	
Molecules	Chemistry
↑↓	
Atoms	Physics

This model assumes that human behavior is influenced by a nested set of co-acting and interacting factors. Lower-level processes tend to supply the "how" of behavior, and also appeal to scientists' desire for parsimony and reductionism. Higher-level processes tend to supply the "why" of behavior, and appeal to scientists' desire for holistic context and broader intelligibility. Lower levels provide the necessary supports and re-requisites for higher-level functioning to emerge, and thus higher levels of organization cannot exist without the lower levels. However, lower levels can never fully account for higher-level effects, precisely because of the characteristic of higher-order emergence, in which "the

whole is more than the sum of its parts." In addition, higher levels of organization can moderate the functioning of lower levels, in ways that also cannot be understood purely in terms of the lower level of analysis. For example, the development of a stem cell depends on its location within the whole, and its destiny cannot be determined merely by knowledge of the stem cell itself. Thus, higher levels of analysis have to be considered in their own terms, i.e. in terms of principles or regularities existing at each level of analysis.

As this reasoning suggests, a hierarchical pluralistic perspective is necessary for a complete understanding of human behavior, in which factors at each level of analysis can have unique main effects upon behavior, and can also evidence cross-level interactions with factors at other levels (Caccioppo, Berntson, & Crites, 1996). Similarly, every type of human science (i.e. at every level of analysis within Figure 1) is needed for full understanding – none can be reduced to any other, and each has its own part to play within the "final" model of human behavior. Of course, the relative contribution of factors and sciences at different levels of analysis doubtless depend on the particular behavioral phenomenon being studied (i.e., biologically oriented explanations might best explain a trip to the kitchen, and personality oriented explanations might best explain a trip to medical school). Although such variations doubtless exist and merit empirical comparisons, the most important point is that no level of analysis is completely reducible to any other level; all of the levels within Figure 1 supply explanatory power, at least for some types of behavioral phenomena (we might call this the "irreducibility" postulate).

To apply the model, let us take an example. A person is choosing to work with another person, in a situation in which there is some risk of being exploited. This behavioral choice might be explained in terms of neuro-chemical factors (i.e. elevated dopamine or serotonin levels within the person's brain), cognitive factors (i.e. high expectancies, accessibilities, or calculated utilities within the person's mind), personality factors (i.e. particular values, traits, and self-images within the person's personality), social-contextual factors (i.e. particular communication patterns or status relations existing between the two personalities), and cultural factors (i.e., particular norms, traditions, or orientations of the culture in which the two personalities interact). The goal of multi-level empirical analysis would be to determine how to best predict a target behavior (such as cooperation by a given person in a given situation in a given culture), by considering the main and interactive effects of relevant factors at every level (or at least many levels) of analysis. Of course, we do not yet possess the modeling capability to handle multi-level models of great complexity (i.e., four or more levels; Hox, 2002), and even if we did, the sheer quantity of data required would be daunting (i.e., samples of thousands of people and dyads from around the world upon whom thousands of measurements would be made). Still, thinking in these terms may be a useful exercise.

Focusing on Personality

Much contemporary personality research focuses on the *cognitive* level of analysis shown in Figure 1, considering expectancies, framing, action-plans, priming and semantic associations, if-then contingencies, and the like, in order to understand and explain human choices and actions. Indeed, there is sometimes an attempt to try to completely explain personality in terms of cognitive information-processing (Cervone, 2004; Shoda & LeeTiernan, 2002). However, I believe it is vital to consider personality processes at their own level, rather than attempting to reduce them to lower levels. What are the irreducible psychological contingencies and imperatives that operate at this higher level of analysis, which must be considered on their own terms?

In order to begin to approach this question, it is necessary to further unpack the personality level of analysis of Figure 1. One potentially useful framework for doing so is provided in Figure 2. The framework builds upon McAdams' proposed "three tiers" of personality and personality theory. McAdams (1996, 1998) argued that complete personality analysis involves consideration of the person's personality traits (biologically, temperamentally, and historically influenced patterns of thinking and feeling), his or her goals and motives (the conscious objectives, projects, and purposes that he or she pursues), and his or her self and self-concepts (the narratives and self-images in which the person lives). McAdams argued that each of these three levels of analysis supplies independent information about the person, because none of the levels are reducible to other levels. Thus, self-level processes can never be completely reduced to motivation-level processes, and motivation-level processes can never be reduced to trait-level processes. Conversely, traits have their own reality which will never be explained simply in terms of motivation-level and self-level processes. It is noteworthy that McAdams located the three tiers in a hierarchical framework, from traits up to motivations up to selves (see Figure 2).

Figure 2. Four "tiers" of personality and personality theory

Self/Life-Story

+

Personality = Goals/Intentions

+

Traits/Individual Differences

+

Organismic Foundations
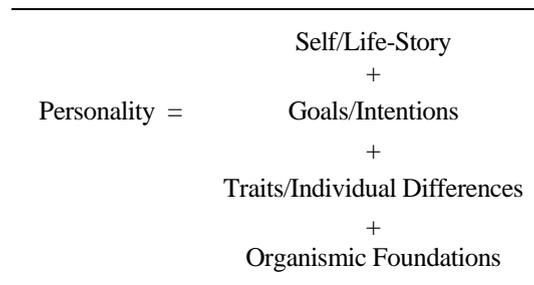
Whereas the traits, motives and selves levels address important domains of individual difference, it also seems important to consider basic personality processes that are common to all individuals, upon which individual differences rest (Buss, 1995). Thus, Sheldon (2004) argued that there should also be a fourth, "organismic foundations" level appended to bottom of McAdams' hierarchy (as has been done in Figure 2). Sheldon took an evolutionary perspective in elaborating on this level, specifically by considering innate physical needs and drives, innate socio-cognitive mechanisms, innate psychological needs and motives, and innate socio-cultural universals. In particular, Sheldon (2004) focused on basic psychological needs at this level, because of their relevance for optimal functioning and well-being (Deci & Ryan, 2000). He concluded that security, self-esteem, autonomy, competence, and relatedness comprise the universal set of psychological needs that all humans in all cultures need in order to thrive (Sheldon, Elliot, Kim, & Kasser, 2001; Sheldon, 2004).

Notice that the four levels of analysis depicted in Figure 2 can be viewed as hierarchically nested, at least to some extent (McAdams, 1996). Personality traits emerge in the interaction between basic human nature and the individual person's unique genetics and developmental history; goals and motives emerge in the interaction between the person's personality traits and his/her environment and affordances; and selves and self-stories emerge in the interaction between the person's motives, goals, and behaviors and his/her desire to tell a coherent life-story. Thus, the four tiers described above might be inserted directly into Figure 1, as elaborations at the level of personality. However, it is doubtful that goals "emerge" from trait functioning or that selves emerge from goal functioning, at least not in the same way that social interaction patterns emerge from the functioning of two or more personalities. Still, it is quite possible to construe motivational processes as emerging from trait processes in a developmental/longitudinal sense, and self processes as emerging from motivational processes in a developmental/longitudinal sense (McAdams & Olson, in press). For example, a young boy's trait of openness to experience might lead to motives to find and answer questions, which might lead to the identity of "scientist," as he becomes a young man. However, even if the assumption of strong functional emergence does not hold in the case of the four levels of personality, I still contend that they depict four unique and irreducible forms of personological inquiry, and that together they usefully elaborate upon the "personality" level of analysis depicted in Figure 1.

Figure 3 presents the top six levels of the model, which I have elsewhere referred to as the "Six Levels of Personality in Context" (SLOPIC) model (Sheldon, 2009). Although the SLOPIC model stops at the level of personality, ignoring the cognitive and biological processes that lie beneath and help to constitute personality, this seems appropriate given the predominant focus of positive psychology upon personality and social factors. Indeed, it may not make sense to

speak of the "positive psychology" of neurotransmitter or neuro-cognitive functioning – only as personality processes (and processes higher in the model) enter the picture does positive psychology truly become relevant. Thus, I suggest that the SLOPIC model may provide a way of integrating all of the primary types of factors and predictors of OPF currently addressed by positive psychology.

Figure 3. The "Six Levels of Personality in Context" (SLOPIC) Model

6. Culture (Societal influences)
5. Social Interaction (Interpersonal influences)
4. Self/Life-Story (Personal influences)
3. Goals/Intentions (Motivational influences)
2. Personality Traits (Dispositional influences)
1. Organismic Foundations (Universal influences)

Applying the Framework to Consider SWB and Optimal Functioning

In this section of the article I hope to show, in greater detail, how the SLOPIC might be applied to consider the determinants of SWB. First, I will briefly review what is known about the predictors of well-being at each level of analysis, giving a sense of which particular factors and constructs, taken singly at each level, are reliably associated with SWB. Second, I hope to show that psychological need-satisfaction, at the foundational level of personality, may be the "ultimate arbiter" or most proximal determinant of optimal functioning. Recent data supporting this second proposition will also be described.

Evolved human nature. As discussed above, psychological needs, conceived of as small set of experiential nutrients that motivate and reward adaptive behavior of many different types, may provide the most relevant type of human universal to consider with respect to subjective well-being (SWB). From a needs perspective, one important initial task of researchers is to identify the most parsimonious set of types of experiences that contribute to SWB, within all persons and all cultures. For example, Sheldon et al. (2001) compared ten candidate psychological needs as features of participant-listed "most satisfying events," finding that autonomy, competence, and relatedness, the three needs proposed by Self-determination theory (Deci & Ryan, 1985, 2000), were both most strongly present within these events (compared to the other candidate needs of meaning/self-actualization, safety/security, pleasure/stimulation, money/luxury, popularity/status, and physical health), and in an orthogonal test, were also each uniquely associated with positive affective tone during these events. In addition, self-esteem (the tenth candidate

need) also emerged as a potential "true" need, by both the mean level and unique association criteria. The other six candidate needs were ruled out, by this approach. Importantly, essentially the same pattern of results was found within both American and South Korean samples, supporting Deci and Ryan's (2000) claim that autonomy, competence, and relatedness predict thriving within all humans, although the ordering of self-esteem and relatedness varied between South Korea and the U.S., in the way one would expect. These findings suggest that interventions designed to enhance autonomy, competence, and relatedness need-satisfaction may provide important routes to SWB (Deci & Ryan, 2000). The case of self-esteem is more complicated, an issue which goes beyond this article.

Readers may wonder why "autonomy" is found to predict SWB in every culture, since cultures vary in their individual-centeredness versus group-centeredness or individualism versus collectivism. Although I can only touch on this issue here, Self-determination theory has long argued that when autonomy is defined as volition and internal "owning" of behavior, rather than as independence and insensitivity (an unfortunate definition of autonomy which can be found in the literature), then it does emerge as a need (Deci & Ryan, 2000). Much research has supported the proposition that feelings of autonomous agency (as compared to feelings of being controlled and coerced) predict SWB in every type of cultural context (Sheldon, 2004).

Personality traits. Personality traits are "broad individual differences in behavior, thought, and feeling that account for general consistencies across situations and over time" (McAdams & Pals, 2006, p. 212). Traits have both genetic and developmental roots, as factors like basic temperament, arousability, and reward sensitivity interact with cumulative learning to produce stable dispositional signatures. Many studies have examined the well-being and functional correlates of various personality traits. In an authoritative meta-analysis of 137 different personality traits, DeNeve and Cooper (1998) concluded that the traits of repressive-defensiveness, trust, emotional stability, locus of control, desire for control, hardiness, positive affectivity, private collective self-esteem, and tension were most strongly associated with SWB. Of course, these 137 traits were not independent from each other. When Deneve and Cooper grouped the 137 traits according to their overlap with the big five traits (McCrae & Costa, 1990), Neuroticism emerged as the single strongest predictor of SWB (both positive and negative forms of SWB). However, some researchers have also identified extraversion as an important trait-based predictor of SWB, via both its sociality and positive affectivity components (Diener & Lucas, 1999). In contrast, conscientious, agreeableness, and openness to experience appear to be less central predictors of SWB, although each of them has emerged as significant in some studies. Notably, there are many other personality traits or dispositions besides those from the big five, which can also be studied as predictors of SWB. And indeed, many such traits have recently emerged from the "positive psychology" tradition, including

harmonious passion (Vallerand et al., 2003), mindfulness (Brown & Ryan, 2003), and gratitude (Emmons & McCullough, 2003).

Goals and motives. A wide variety of research has used goal constructs to predict SWB. These factors include goal content (i.e., intimacy, growth, and community rather than money, appearance, and fame; Kasser & Ryan, 1993, 1996, 2001); goal-motivations (i.e., autonomous rather than controlled reasons for striving; Sheldon & Elliot, 1999, Sheldon & Houser-Marko, 2001); goal-attainment and progress (Bandura, 1989; Brunstein, 1993); goal specificity (concrete rather than abstract; Emmons, 1992); goal framing (approach rather than avoidance; Elliot & Sheldon, 1998); and goal meaningfulness and manageability (McGregor & Little, 1998). In short, it appears that SWB is associated with pursuing and achieving self-endorsed and meaningful (yet manageable) goals that involve personal growth, positive relations with others, and contributing to communities (Sheldon & Schmuck, 2001).

Self and self-concept. Similarly, a wide variety of research has used self – related constructs to predict SWB. These factors include having high self-esteem, stable self-esteem, or non-contingent self-esteem (Kernis, 2006); having high self-efficacy, self-agency, or self-determination (Deci & Ryan, 1991); having high self-acceptance and self-compassion (Neff, 2003); having high concept clarity, self-knowledge, or self-certainty (Story, 2004); and so on. In addition to these likert-based findings, SWB is also predicted by certain types of themes within peoples' evolving self-narratives, including themes of personal growth, positive improvement over time, and redemption from earlier difficulties or failures (King & Hicks, 2006; McAdams, 2006).

Social relations. The list of interpersonal factors associated with SWB is long. Being happily married and having secure attachment relations (Shaver, & Mikulincer, 2007), receiving high-quality social support from others within one's life (Sarason & Sarason, 2001), receiving autonomy-support from authorities (coaches, bosses, mentors; Deci & Ryan, 2000), having close friends with whom one shares intimate life-details (Reis & Gable, 2003), having harmonious interactions with one's co-workers (Warr, 2007), and belonging to social groups that share and support one's interests (Bettencourt & Sheldon, 2001), all predict SWB (see Myers, 1999, for a review). In part for these reasons, Baumeister and Leary (1995) proposed, consistent with SDT's postulation of a relatedness need, that all people have a basic "need to belong." Presumably, it is the satisfaction of this need that mediates between the positive interpersonal factors, listed above, and SWB.

Culture. The best known distinction between cultures of different types is that between individualistic and collectivist cultures (Triandis, 1995). It is well established that members of individualist cultures tend to report higher SWB on average (Diener, Diener, & Diener, 1995), perhaps because individual self-

expression and fulfillment is more accepted and supported, and even expected, within such cultures (Markus & Kitayama, 1991). Other culture-level factors that appear to influence SWB include national variables such as the level of economic attainment and economic equality (Veenhoven, 1991), high levels of interpersonal trust and political discussion (Inglehart, 1990), support for human rights and political stability (Diener & Suh, 1999), and of course the relation of the culture to neighboring cultures (i.e., is there war or peace? Shamai & Kimhi, 2006).

Need-satisfaction as the "ultimate arbiter". So far we have been seeking the optimal profile of individual differences for predicting high SWB. What scores should people have, on which stable personality constructs, and how should these constructs relate to each other, in order for people to be happy? However, it would also be useful to understand *why* these contents produce SWB. For example, what is it about low neuroticism, high goal-attainment, and high self-esteem, or about the particular structure of one's traits such as agency and communion orientations, that helps to create SWB? To answer this question, we may take advantage of the fact that the lowest level of personality, existing "beneath" of individual differences, presumes to describe universal characteristics shared by all human beings. Perhaps the individual difference constructs discussed above all have positive effects because they help people to satisfy basic psychological needs? Indeed, one means of judging the desirability or adaptability of particular personality characteristics, types of social relation, or types of cultural setting, may be to examine their associations with need-satisfaction (Ryan & Deci, 2008). Again, evolved human nature may supply basic constraints upon individuality, such that all humans, despite their wide variations, need to satisfy species-typical psychological needs in order to thrive.

Figure 4 (reprinted from Sheldon, 2004) provides a graphic depiction of the idea that need-satisfaction may be the "ultimate arbiter." The figure illustrates that consistency between the differing levels of personality may or may not be important, depending on the contents of the levels involved. If a person's personality is dominated by antisocial traits, it may be better if his/her goals are inconsistent with the traits, especially if those goals involve becoming more considerate and sociable. As another example, if a person's sense of self is negative and self-denigrating, then it may be better if that self-concept is inconsistent with his or her more positive traits and dispositions. Still, *all* contents, at all levels, should ideally be consistent with (and help supply) experiences of autonomy, competence, and relatedness.

Figure 4. Optimal Arrangements among the Levels of Personality

Self/Life-Story

Goals/Intentions

Personality Traits

Evolved Psychological Needs

<u>Solid</u> connecting lines indicate that the two levels should at least be consistent with each other, if not functionally linked.

<u>Dashed</u> lines indicate that the 2 levels should not necessarily be consistent; it depends on the content at the two levels.
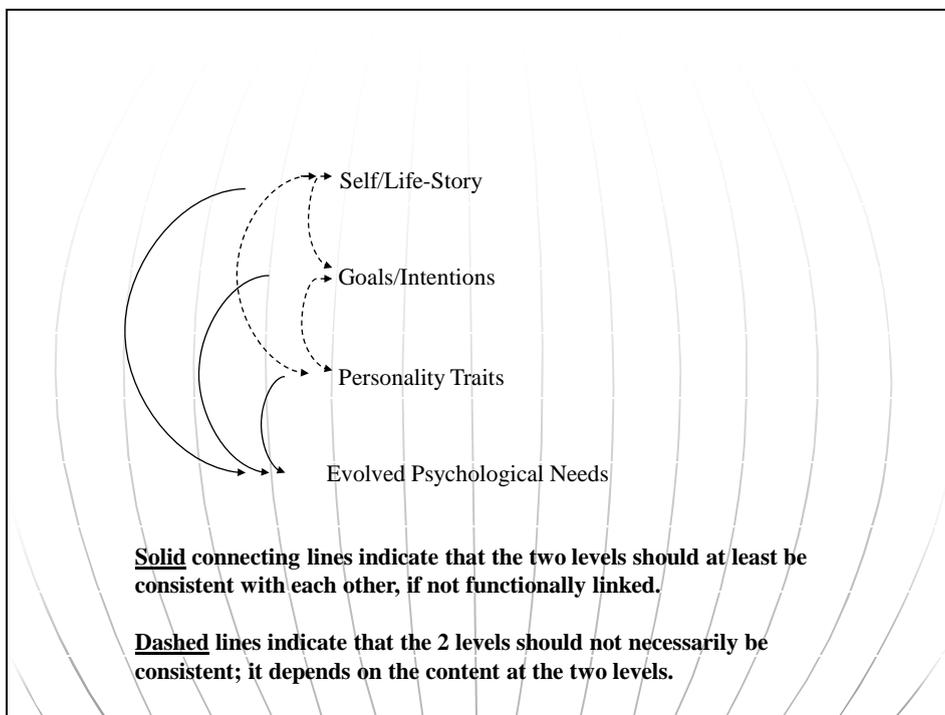
Data Supporting the SLOPIC Model

Having completed a brief review of important predictors of SWB at each level of the SLOPIC model, I will now discuss data in which the entire model was applied simultaneously. Again, positive psychology needs an integrative framework that can include all positive factors at once, and the data described below were meant to accomplish this for the SLOPIC model. An important aspect of the SLOPIC model is the claim that all of the levels of analysis are necessary for complete understanding; that is, no level's effects can be completely reduced to that of another (McAdams, 1996; Sheldon, 2004). One recent study (Sheldon & Tan, 2007) tested this postulate by assessing SWB and also many known predictors of SWB located at each of the six levels of analysis within Figure 2. Specifically, autonomy, competence, and relatedness were assessed to represent needs, at the foundational level of personality; the big five traits were assessed to represent the trait/disposition level of personality; recent goal-attainment and goal self-concordance were assessed at the goal/motive level of personality; self-esteem and positive possible selves were assessed at the self/self-narrative level of personality; reports of social support and autonomy support from friends, family, and mentors

were assessed at the social relations level of analysis; and samples were obtained within both the U.S. and Singapore, to represent the cultural level of analysis.

The data analysis proceeded in two stages: 1) identify the single best predictor of SWB from among the candidates at each conceptual level of analysis, and then 2) pit the thus-identified best predictors against each other, to test the irreducibility of each type of information. The final analysis revealed that SWB could best be predicted by considering the simultaneous significant effects of competence need-satisfaction, (low) neuroticism, goal-attainment, self-esteem, social support, and cultural membership (U.S. participants having higher SWB than Singaporean participants). None of these factors' effects could be accounted for by any of the other factors, and all were necessary for the most complete picture.

In a related but more ambitious study (Sheldon, Cheng, & Hilpert, 2009), we assessed the SWB, needs, traits, values, and self-construals of 4400 participants nested within 24 different cultural groups. Each of the 24 cultural groups received a score on the individualism-collectivism scale derived within Oyserman, Coon, and Kemmelmeier's (2002) meta-analysis, allowing for a multilevel assessment of this cultural feature upon the results. Following a similar analytical procedure as above, the best predictor at each level of personality was first identified; competence need-satisfaction, (low) neuroticism, self-direction values, and independent self-construal (the social relations level of analysis was not assessed in this study). In the second stage, each of these variables was associated with SWB, as expected, independently of the others. In addition, cultural individualism ($N = 24$) had its own unique higher-level association with SWB. Finally, support was found for a top-down path model in which culture affects self-construals, which in turn affects motives, which in turn affects traits, which in turn affects need-satisfaction and thus SWB. Also, each construct's top-down effects upon lower-order variables were mediated by the variable immediately below that construct, so that no direct paths were needed – for example, no path was needed from culture to motives (because of the intervening self-construal variable), or from motives to need-satisfaction (because of the intervening trait variable). In sum, the latter two studies support important aspects of the SLOPIC model, namely, the idea that information at every level of the six-level hierarchy needs to be simultaneously considered in order to understand SWB, and the idea that top-down causality chains can occur.

What about the claim that need-satisfaction is the "ultimate arbiter" for determining what factors and processes are optimal? To address this claim concretely, I conducted a re-analysis of the Sheldon and Tan (2007) data. Recall that Sheldon and Tan showed that competence need-satisfaction, neuroticism, goal-progress, self-esteem, social support, cultural membership, and rated consistency among these levels of the person, all predicted SWB. In the re-analyses, I examined whether need-satisfaction mediated the associations of the other six predictors. Indeed, significant (although only partial) mediation, according to the Sobel test, was found for all six predictors. Thus, we might say that the positive effect of each

of the upper-level predictors is partially explained by the fact that it helps people to satisfy their psychological needs. A similar but stronger pattern was found in the 24-culture Sheldon, Cheng, and Grouzet (2009) data, mentioned earlier; psychological need-satisfaction completely mediated the effects of all of the higher-level predictors (except neuroticism).

There is also considerable other recent evidence supporting the explanatory significance of psychological need-satisfaction, coming from studies that address the need-satisfying properties of constructs at just one level of Figure 2, rather than assessing all six levels at the same time. At the trait level of analysis, Wei, Shaffer, Young, and Zakalik (2005) showed that need-satisfaction mediated between dispositional attachment styles and well-being outcomes, and Sheldon and Gunz (2009) showed that need-satisfaction partially mediated the neuroticism to SWB relationship. At the goal level of analysis, Sheldon and Elliott (1999) showed that the positive effects of longitudinal goal-attainment upon changes in SWB were mediated by the need-satisfying daily experiences that goal-attainment produced during the striving period, and Niemiec, Ryan, and Deci (2009) showed that the effects of post-graduation goal choices upon changes in SWB were mediated by need-satisfaction. At the self level of analysis, Sheldon and Gunz (2009) showed that psychological need-satisfaction mediated the associations of two self-based constructs upon SWB: feeling self-determined when playing one's "social character," and having a small discrepancy between the social character and one's "unguarded" self. Also, Thorgersen-Ntoumani and Ntoumanis (2007) showed that need-satisfaction mediated between negative self-perceptions of aerobic instructors and symptoms of eating disorders. At a dyadic relations level of analysis, Patrick, Knee, Canavello, and Lonsberry (2007) showed that the positive effects of secure attachment relationships upon SWB were mediated by psychological need-satisfaction, and Smith (2007) showed that reports of positive sexual relations within couples are mediated by psychological need-satisfaction. At a social groups level of analysis, Sheldon and Krieger (2007) showed that the differential three-year effects upon SWB of attending one versus another law school were mediated by the differential amounts of need-satisfaction afforded by the two schools. Additionally, Filak and Sheldon (2003) showed, in a study of 14 different classrooms, that reduced autonomy and relatedness (but not competence) need-satisfaction mediated the negative association between the number of times the teacher had taught the course and positive teacher-course evaluations. There has been very little research examining need-satisfaction as a mediator of various cultural differences, although Sheldon, Chen, and Hilpert (2007; discussed above) found that that the effect of culture-level individualism upon SWB was mediated by associated differences in need-satisfaction.

To conclude, I suggest that each level of personality, as well as the social and cultural contexts in which the personality is immersed, are relevant to SWB. Ultimately, these effects are (at least partially) accounted for via their effects on

basic psychological need satisfaction (Deci & Ryan, 2000). Figure 4 graphically illustrates this idea, which is being supported by an increasing number of studies. I further suggest that large-scale longitudinal studies, assessing multiple levels of personality, nested within multiple types of relationships or groups, within multiple types of culture, along with measurements of basic need-satisfaction, will be needed to fully comprehend the dynamics and determinants of SWB.

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