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Too Much of a Good Thing: The Challenge and Opportunity of the Inverted U

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Abstract
Aristotle proposed that to achieve happiness and success, people should cultivate virtues at mean or intermediate levels between deficiencies and excesses. In stark contrast to this assertion that virtues have costs at high levels, a wealth of psychological research has focused on demonstrating the well-being and performance benefits of positive traits, states, and experiences. This focus has obscured the prevalence and importance of nonmonotonic inverted-U-shaped effects, whereby positive phenomena reach inflection points at which their effects turn negative. We trace the evidence for nonmonotonic effects in psychology and provide recommendations for conceptual and empirical progress. We conclude that for psychology in general and positive psychology in particular, Aristotle's idea of the mean may serve as a useful guide for developing both a descriptive and a prescriptive account of happiness and success.

Keywords
happiness, success, well-being, curvilinear, inverted U, nonmonotonic

> Both excessive and defective exercise destroys the strength, and similarly drink or food which is above or below a certain amount destroys the health, while that which is proportionate both produces and increases and preserves it. So too is it, then, in the case of temperance and courage and the other virtues. For the man who flies from and fears everything and does not stand his ground against anything becomes a coward, and the man who fears nothing at all but goes to meet every danger becomes rash; and similarly the man who indulges in every pleasure and abstains from none becomes self-indulgent, while the man who shuns every pleasure, as boors do, becomes in a way insensible; temperance and courage, then, are destroyed by excess and defect, and preserved by the mean.
>
> —Aristotle (trans. 1999, p. 22)

What makes for a happy and successful life? According to Aristotle (trans. 1999), happiness and success are a function of cultivating virtues that exist at the mean between the extremes of deficiency and excess (Nussbaum, 1995, 2004). For example, in the domain of self-presentation, honesty is the mean between the deficiency of self-deprecation and the excess of boastfulness. In the domain of pleasing others, friendliness is the mean between the deficiency of quarrelsomeness and the excess of ingratiation. Although psychologists may be unable to adjudicate these normative philosophical claims, we can provide evidence to inform them. What insights does psychology offer about the effects of deficient, excessive, and moderate virtues on happiness and success?

The closest psychology has come to a theory of virtue is the positive psychology movement. In the decade since the launch of positive psychology (Seligman & Csikszentmihalyi, 2000), scholars have made extensive research progress. We now have evidence for the well-being and performance benefits of a wide range of strengths, virtues, and positive experiences. For example, research has shown that happiness can be boosted by gratitude exercises, such as counting one's blessings and delivering "thank you" messages (Emmons & McCullough, 2003; Seligman, Steen, Park, & Peterson, 2005); prosocial behaviors, such as spending money on others and engaging in random acts of kindness (Dunn, Aknin, & Norton, 2008; Lyubomirsky, Sheldon, & Schkade, 2005); and making choices that provide a sense of freedom and autonomy (Ryan & Deci,

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2000). Research has also shown that positive emotions can enhance performance and creativity (for reviews, see Fredrickson, 2001, and Lyubomirsky, King, & Diener, 2005) and that threats to stress and physical health can be mitigated by experiencing positive emotions (Tugade, Fredrickson, & Barrett, 2004), affirming one's values (Creswell et al., 2007), and thinking optimistically (Peterson, Seligman, & Vaillant, 1988; Taylor & Kemeny, 2000). Overall, positive psychology interventions have proven efficacious for both enhancing psychological well-being and reducing depressive symptoms (Sin & Lyubomirsky, 2009). Consequently, researchers have begun to extend the principles of positive psychology into applied disciplines such as organizational studies (Cameron, Dutton, & Quinn, 2003; Luthans & Youssef, 2007) and medicine and healthcare (Hershberger, 2005; Taylor & Sherman, 2004).

Although these findings from positive psychology have produced fundamental advances in scientific knowledge, they are incomplete. Underlying the vast majority of existing theory and research is the assumption that positive traits, experiences, and emotions have monotonic effects on well-being and performance. For example, Seligman (2002) proposed that to increase well-being and effectiveness, people should begin by identifying their signature strengths and then seek to develop them. This theory assumes that "the more developed any strength is, the better people are" (Schwartz & Sharpe, 2006, p. 380). Positive psychologists have recognized that the deficiency of a strength or virtue can harm well-being and performance, but they have paid little attention to understanding when, why, and how the excess of a strength or virtue can harm well-being and performance.

From Aristotle's (trans. 1999) viewpoint, the effects of virtues on human well-being and effectiveness should be nonmonotonic, taking the shape of an inverted U. This insight has important implications for positive psychology and psychology more generally. Indeed, in disparate domains of research, psychologists have increasingly discovered that at high levels, positive effects begin to turn negative. For instance, recent meta-analytic evidence suggests that moderate levels of positive emotions enhance creativity, but high levels do not (Davis, 2008). Further, although happier people have greater longevity on average, intense positive affect has psychological costs (Diener, Colvin, Pavot, & Allman, 1991), extremely cheerful people engage in riskier behaviors (Martin et al., 2002) and live shorter lives (Friedman et al., 1993), and extremely happy people earn lower salaries (Oishi, Diener, & Lucas, 2007).

Building on the notion of the Aristotelian mean, psychologists have good reason to believe that life is nonmonotonic. Suedfeld (1969) referred to this principle as the "ubiquitous U": Across many domains of psychology, one finds that *X* increases *Y* to a point, and then it decreases *Y*. Common examples include the Yerkes–Dodson law (Yerkes & Dodson, 1908) and classic theories of optimal arousal (Eysenck, 1967; Smith, 1983). Despite the intuitive familiarity of the inverted U, psychologists have failed to appreciate fully its prevalence and importance. Our purpose in this article is to draw attention to what may be a fundamental and ubiquitous psychological principle: There is no such thing as an unmitigated good. All positive traits, states, and experiences have costs that at high levels may begin to outweigh their benefits, creating the nonmonotonicity of an inverted U. By attending more carefully to this principle, we believe that psychologists can enrich theory and research toward a deeper, more comprehensive understanding of the conditions that facilitate well-being and performance.

To document the pervasiveness of the inverted U, we review evidence for nonmonotonic effects of a wide range of familiar psychological phenomena on well-being and performance. In doing so, we explore aspects of the human world that may govern these inverted-U relationships and offer suggestions for theoretical and methodological progress. Our recommendations focus on the value of greater attention to conditional effects, limits, inflection points, and countervailing mechanisms that are differentially activated, strengthened, or weakened across discrete ranges of an independent variable.

The Nonmonotonic Effects of Strengths and Virtues

Although Aristotle was famously a virtue theorist, believing that good societies require good (virtuous) people, he also proposed that to flourish, people need to find the *mean*—the right amount of each virtue. In Aristotle's (trans. 1999) language, virtue is "a mean between two vices, the one involving excess, the other deficiency . . . its character is to aim at what is intermediate in passions and in actions" (p. 32). Each of Aristotle's virtues represents an ideal point of balance between two extremes, reflecting the position that desirable attributes should be cultivated in moderation (Nussbaum, 1995, 2004). As Schwartz and Sharpe (2006) argued, "too much of a virtue can be as big an enemy of eudaimonia as too little" (p. 383). In particular, Aristotle (trans. 1999, pp. 28–30) identified nine virtues that exist at intermediate points between deficiencies and excesses (see Table 1).

To take the claim of nonmonotonicity seriously, psychologists must evaluate its empirical support and theoretical underpinnings. Is there evidence that at high levels, strengths and virtues can have negative effects on well-being and/or performance? In the following sections, we review research that identifies well-being and performance costs of high levels of strengths and virtues. Peterson and Seligman (2004) developed a classification system for organizing 24 strengths into six categories of virtues: wisdom and knowledge, courage, humanity and love, justice, temperance, and transcendence. We discovered clear evidence for costs of strengths in the first four virtue categories: wisdom and knowledge, courage, humanity and love, and justice.[1]

Wisdom and Knowledge

Strengths that align with the virtue of wisdom and knowledge include a love of learning, creativity, curiosity, openmindedness, and perspective (Peterson & Seligman, 2004). Although

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Table 1. Aristotelian Virtues

Domain	Deficiency	Excess	Virtue at the mean
Fear	Cowardice	Recklessness	Courage
Pleasure	Prudence	Self-indulgence	Temperance
Giving and taking small sums of money	Meanness	Prodigality	Generosity
Giving and taking large sums of money	Stinginess	Tastelessness	Magnificence
Great honor	Humility	Vanity	Pride
Anger	Spinelessness	Irascibility	Good temper
Self-presentation	Self-deprecation	Boastfulness	Honesty
Giving amusement	Boorishness	Buffoonery	Wittiness
Pleasing others	Surliness	Obsequiousness	Friendliness

these strengths can be conducive to well-being and performance, evidence has shown that at high levels, they have negative effects, because they impede the attainment and expression of other strengths and virtues. For example, Bunderson and Sutcliffe (2003) studied the learning orientations of management teams in a Fortune 100 consumer products company. Past research had shown a positive relationship between team learning orientation and business performance, but researchers had only explored monotonic associations, overlooking the possibility of nonmonotonicity. Bunderson and Sutcliffe (2003) proposed that strong learning orientations can be "inefficient or even dysfunctional" (p. 554), as a focus on learning can distract attention away from performance results, lead members to waste resources on low-probability experiments, and create divergent responsibilities and discoveries that make it difficult to assimilate and disseminate knowledge gained.

In support of this prediction, Bunderson and Sutcliffe (2003) found a curvilinear, nonmonotonic relationship between team learning orientation and business performance. More specifically, teams with moderate learning orientations were most successful in reaching their targeted levels of profitability and maximizing profits per unit sold. Teams with strong learning orientations, on the other hand, achieved lower profitability on these metrics and in some cases even did worse than teams with low learning orientations. Furthermore, these costs began to emerge at lower levels of learning orientation when teams were already high performing; teams that were already successful suffered costs even at moderate levels of learning orientation. This study provides strong evidence of the inverted-U-shaped relationship between learning orientation, as one strength exemplifying the virtue of wisdom and knowledge, and performance. Additional studies suggest that very high levels of openness and cognitive complexity can predispose experts toward believing improbable predictions (Tetlock, 2005). Other evidence has revealed an inverted-U-shaped relationship between education and creative eminence, again suggesting that very high levels of knowledge acquisition lead individuals to "become overcommitted to the traditional manner of viewing scientific, artistic, or political problems" (Simonton, 1976, p. 219).

At high levels, can the virtue of wisdom and knowledge also undermine well-being? Individuals who embrace this virtue tend to seek out complex jobs, which provide opportunities for learning, challenges, skill development, and growth (e.g., Holland, 1996; Judge & Bretz, 1992). Although researchers initially assumed health benefits of job complexity, more recent evidence suggests that high complexity exacerbates stress, burnout, and dissatisfaction. A number of studies have revealed inverted-U-shaped relationships between job complexity and well-being, such that well-being is highest at moderate levels of complexity and lower at high levels of complexity (Champoux, 1992; Janssen, 2001; Xie & Johns, 1995). This pattern is thought to be a function of very complex jobs involving heavy responsibilities that often place overwhelming levels of pressure and demands on employees (Warr, 2007). These findings suggest that in seeking out wisdom and knowledge, individuals often take on heavy burdens that run the risk of undermining their well-being.

Courage

Strengths that align with the virtue of courage include bravery, persistence, integrity, and vitality (Peterson & Seligman, 2004). To illustrate the costs of high levels of courage, let us focus on the strength of persistence. Consider persistence in the form of task practice. Although research has demonstrated that persistent practice facilitates the development of expertise (Ericsson & Charness, 1994), there is also evidence that practice can be most productive in moderation. Langer and Imber (1979) asked individuals to assist with translating sentences into a novel language. They found that individuals who engaged in moderate practice prior to the task made fewer errors than those who engaged in no practice or extensive practice. Although some practice facilitated performance, high levels of practice led to overlearning and inflexibility, preventing individuals from effectively accessing and improving their skills (Langer & Imber, 1979). Consistent with this experimental evidence, in a study of National Basketball Association teams, Berman, Down, and Hill (2002) found that the longer teams practiced and played together, the more games they won. This relationship was mediated by better coordination between players, in the form of assists. However, this benefit of persistent practice dissipated after approximately 4 years, at which point experience appeared to result in overconfidence, complacency, and routine rigidity. As Berman et al. (2002) explained, "the positive effects of shared experience may become negative as the effects of knowledge ossification begin to outweigh any benefits of collective knowledge accumulation" (p. 27). Corroborating these findings, meta-analytic evidence suggests that in many jobs, the relationship between experience and performance takes the form of an inverted U (Sturman, 2003).

Furthermore, although extensive research has linked persistence in the face of failure to higher performance in a variety of

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tasks (e.g., Dweck, 2006; Grant et al., 2007), evidence has shown that very high levels of persistence can undermine performance. Le et al. (in press) found that conscientiousness has an inverted-U-shaped relationship with job performance, especially in simple jobs, presumably because extremely high conscientiousness involves perfectionism and an excessive focus on details at the expense of the bigger picture. Moon (2001) demonstrated that highly persistent, conscientious individuals who strongly value achievement are more likely to escalate their commitment to failing courses of action, investing time, money, and resources in losing endeavors. Such dysfunctionally high levels of persistence may undermine psychological and physical well-being by preventing individuals from disengaging from goals at appropriate times (Miller & Wrosch, 2007; Wrosch, Scheier, Carver, & Schulz, 2007).

Optimism, self-efficacy, and self-esteem. These effects may be driven in part by excessive levels of optimism and self-efficacy that fail to correspond to reality. Consistent with this notion, research has demonstrated inverted-U-shaped relationships between optimism and performance (J.D. Brown & Marshall, 2001). At moderate levels, optimism provides confidence and increases planning, but very high optimism leads to inadequate preparation and the underestimation of risks. As Haaga and Stewart (1992) explained, optimism can "be too extreme, leading to inappropriate complacency about the adequacy of one's skills for coping with difficult situations" (p. 27).[2] Similarly, research shows that high levels of self-efficacy constitute overconfidence, which can result in groupthink (Whyte, 1998), persistence with failing strategies (Whyte & Saks, 2007), less time and energy invested in learning and planning (Vancouver & Kendall, 2006), and poor performance (Dunning, Heath, & Suls, 2004; Hayward & Hambrick, 1997; Stone, 1994; Vancouver, Thompson, Tischner, & Putka, 2002). As Bandura and Locke (2003) summarized, "In preparing for challenging endeavors, some self-doubt about one's performance efficacy provides incentives to acquire the knowledge and skills needed to master the challenges" (p. 96).

The form of the relationship between optimism and well-being also appears to take the shape of an inverted U. Studies have shown that compared with high and low optimism, moderate optimism is associated with more effective coping with multiple sclerosis and Parkinson's disease (De Ridder, Schreurs, & Bensing, 2000), slower HIV disease progression (Milam, Richardson, Marks, Kemper, & McCutchan, 2004), and lower sympathetic nervous system arousal (Segerstrom, 2001). Very high levels of optimism appear to be costly because they encourage riskier health behaviors and high expectations that are difficult to meet (Milam et al., 2004). In summary, Milam et al. (2004) concluded that "the nonlinear relationship between optimism and an objective health outcome provides evidence that there could be an 'optimal' margin of optimism" (p. 177). Baumeister, Campbell, Krueger, and Vohs (2003) summarized similar evidence on self-esteem, suggesting that at very high levels, self-esteem can be costly to performance, interpersonal relationships, and health.

Being too happy. Another strength aligning with the virtue of courage is vitality, which captures zest, enthusiasm, happiness, vigor, energy, and enthusiasm (Peterson & Seligman, 2004). Psychologists have discovered inverted-U-shaped relationships of cheerfulness and happiness with physical health: As noted previously, evidence has demonstrated that highly cheerful individuals actually engage in riskier behaviors (Martin et al., 2002) and have lower longevity (Friedman et al., 1993). Extending these results to work success, Oishi et al. (2007) analyzed panel and longitudinal studies from Australia, Germany, and the United Kingdom, and in all three samples, life satisfaction had an inverted-U-shaped relationship with income 5 to 15 years later. People who were moderately satisfied with their lives earned the most money, and those who were extremely satisfied earned less. Individuals who were extremely satisfied also achieved lower levels of education and engaged in less political participation than those who were moderately satisfied (Oishi et al., 2007). Interestingly, life satisfaction had a linear relationship with success in close relationships and volunteer work.

Although these data are longitudinal, they remain correlational, leaving questions about causality unanswered. For example, it may be the case that people with lower dispositional levels of happiness simply come to prioritize success over happiness and thus self-select into higher levels of the achievement continuum. From this viewpoint, extreme happiness does not reduce success; it merely describes a different segment of the population. Another possibility, advocated by Oishi et al. (2007), is that extreme happiness fails to produce the "slight dissatisfaction" (p. 349) that motivates people to set high goals, work to create change, seek out more money, and pursue education and self-improvement. In addition, extreme levels of happiness may detract from career success and political engagement by fostering excessive levels of sociability (e.g., Lyubomirsky, King, & Diener, 2005) and fueling complacency, reducing motivation (e.g., Norem & Chang, 2002). Similarly, Fredrickson and Losada (2005) speculated that a ratio of "too much" (p. 684) positive to negative emotions, exceeding 5:1 and especially 11:1, can spell doom for marriages, work teams, and recovery from depression. Altogether, these ideas suggest that at high levels, the strength of zest may have negative effects on work success and physical health.

Humanity and Love

Strengths that align with the virtue of humanity and love include caring, kindness, generosity, and social intelligence (Peterson & Seligman, 2004). Whereas psychologists have primarily documented the well-being benefits of generosity (e.g., Dunn et al., 2008; Lyubomirsky, Sheldon, & Schkade, 2005), Flynn (2003) focused on the possibility of nonmonotonic effects of generosity on performance. Using data on helping exchanges between professional engineers, he found an inverted-U-shaped relationship between generosity (giving more than one received) and productivity (quality, quantity, and efficiency of work completed relative to managers' goals).

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At moderate levels, generosity allows employees to gain status and call in favors from colleagues, but at high levels, generosity consumes time, energy, and other finite resources that make it more difficult to complete one's own work.

A parallel pattern has emerged with respect to the relationship between volunteering and well-being. In a departure from past research on the well-being benefits of volunteering, Windsor, Anstey, and Rodgers (2008) proposed that at very high levels, volunteering would decrease psychological well-being through two mechanisms: increasing role overload and reducing time and energy available for other meaningful activities. Data from a sample of adults in their 60s revealed the predicted inverted-U-shaped relationship of time spent volunteering with psychological well-being. Although moderate levels of volunteering predicted higher positive affect, lower negative affect, and higher life satisfaction, high levels of volunteering were associated with lower positive affect, higher negative affect, and lower life satisfaction. The negative affect costs of high levels of volunteering were especially pronounced for participants without partners. Because these data are correlational, it is plausible that they are driven by selection effects, such that individuals with lower well-being seek to compensate for loneliness and depression by volunteering more. Although experimental and longitudinal studies are necessary to demonstrate causality, another possibility is that very high levels of volunteering reduce well-being by creating overload and limiting engagement in other meaningful activities. As the authors explained, "The highest well-being scores were evident among those who engaged in at least 100 hr of volunteer activity per year but fewer than 800 hr ... engaging in high levels of volunteering can have adverse effects on well-being as a result of an increased burden of responsibility" (Windsor et al., 2008, pp. 67, 69).

Another manifestation of the virtue of humanity and love is empathy, the feeling of concern for others in need. Although psychologists have traditionally demonstrated that empathy increases prosocial behavior (for a review, see Batson, 1998), there is evidence that very high levels of empathy can be emotionally aversive and undermine prosocial behavior. Eisenberg (2000) summarized research on the phenomenon of "empathic overarousal" (p. 674), in which a strong experience of empathy cultivates feelings of distress, which have the boomerang effect of distracting attention away from others and toward managing one's own aversive feelings (see also Eisenberg et al., 1994, and Hoffman, 1982).

Research also suggests that empathy runs the risk of undermining task performance. High levels of empathy can cloud judgment, leading to self-sacrificing behaviors that benefit others at the expense of achieving one's own goals (Galinsky, Maddux, Gilin, & White, 2008) or sometimes, even, fail to benefit others. For example, Groopman (2007) documents his own failure to diagnose a life-threatening infection in a hospitalized cancer patient. Groopman missed the source of the infection because his empathy for the patient's discomfort in the face of grueling chemotherapy induced him not to ask the patient to roll over and be examined for bedsores. Doctors, lawyers, and other professionals are constantly balancing the competing calls for empathy and detachment (e.g., Kronman, 1993). In addition, psychological research demonstrates that high empathy can encourage unethical behaviors that help the targets of empathy but violate principles of fairness and justice (Batson, Klein, Highberger, & Shaw, 1995; Gino & Pierce, 2009). This evidence illustrates the trade-offs among different virtues and the potential value of studying the search for the Aristotelian mean between them.

Justice

Strengths that align with the virtue of justice include citizenship, social responsibility, loyalty, teamwork, fairness, and leadership (Peterson & Seligman, 2004). Although psychologists tend to focus on the benefits of these virtues, research has revealed their potential performance and well-being costs. For example, research has revealed an inverted-U-shaped relationship between commitment to an organization and employees' intentions of reporting illegal and unethical practices (Somers & Casal, 1994). At high levels of commitment, it appears that employees become too loyal: They have so deeply internalized the organization's values that they are unable to see wrongdoing or unwilling to raise criticisms. At moderate levels of commitment, on the other hand, employees care enough to blow the whistle but have greater capabilities to recognize wrongdoings and greater motivations to question the organization's practices (Somers & Casal, 1994). Advocating this type of moderate loyalty, Meyerson and Scully (1995) proposed that tempered radicalism—balancing organizational commitment with commitment to important causes that are at odds with the organization's values—is more conducive to advancing meaningful change than pure loyalty.

The strength of loyalty may also lead individuals to avoid conflict, which can be disruptive to creativity and innovation. De Dreu (2006) studied conflicts about resource distribution, procedures and policies, and interpretations of information among postal service teams in the Netherlands. He found an inverted-U-shaped relationship between these task conflicts and team innovation, mediated by information sharing. Teams without conflict had little reason to exchange information, which prevented them from deeply processing and developing novel ideas. This research illustrates how the strength of loyalty has the potential to foster so much harmony that performance is impaired.

Teamwork is another strength included in the justice virtue, and extraversion is among the most consistent personality predictors of teamwork effectiveness (Barrick, Stewart, Neubert, & Mount, 1998). Extraverted individuals tend to be more sociable, gregarious, enthusiastic, and energized by working in teams, which facilitates cohesion (Barrick et al., 1998). However, research shows that work teams can have too many extraverts. An inverted-U-shaped relationship exists between the proportion of extraverts in a team and its performance, which is due to the fact that when a team is dominated by extraverts, task focus suffers (Barry & Stewart, 1997). This evidence

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reveals how the very traits that facilitate teamwork can, in high proportions, undermine it.

An additional strength aligned with the justice virtue, asserting oneself in a leadership role, also shows a nonmonotonic association with performance. In field studies, Ames and Flynn (2007) found an inverted-U-shaped relationship between assertiveness and leadership effectiveness. At moderate levels, assertiveness facilitates the attainment of instrumental outcomes, but at high levels, it harms social outcomes by undermining the quality of interpersonal relationships. Despite its intuitive association with leadership, assertiveness, too, appears to be optimal in moderation. Evidence has also shown that the virtues of justice have well-being costs at high levels. For instance, Bolino and Turnley (2005) found that employees who engage in high levels of citizenship behavior—taking initiative to demonstrate loyalty and contribute to the organization—experience higher levels of role overload, job stress, and work–family conflict.

The Vices of Virtues: Toward a General Explanation

The evidence suggests that the very strengths and virtues that positive psychology has linked to higher well-being and performance can, at high levels, undermine the outcomes they are intended to promote. This support for the inverted-U prediction highlights the value of gaining a more systematic understanding of the general mechanisms that govern the nonmonotonic effects of strengths, virtues, and positive experiences. The aforementioned findings highlight three mechanisms worthy of further consideration: value conflicts; differences in shapes, slopes, and thresholds for positive and negative effects; and nonmonotonic single effects.

Virtue conflicts. One general mechanism concerns potential conflicts between different virtues. Virtues are often conceptualized as independent, but in a complex social world, the pursuit of one virtue has consequences for other virtues. For example, Bardi, Lee, Hofmann-Towfigh, and Soutar (2009) summarized evidence that individuals often face fundamental conflicts between actions that fulfill conservation versus openness values and self-enhancement versus self-transcendence values. With respect to conservation versus openness, in many situations, individuals must make choices about whether to conform or rebel, follow old traditions or create new ones, and play it safe or take risks. With respect to self-enhancement versus self-transcendence, in many situations, individuals must make choices about whether to create self-serving power hierarchies or pursue equality, maximize achievements or help competitors, and consume the planet's resources or preserve them for future generations. Similarly, Brewer (1991) observed that individuals who fit in too well fail to stand out and vice versa, motivating a search for optimal distinctiveness that simultaneously allows one to feel similar to and unique from others.

These types of conflicts are apparent in the studies that we reviewed earlier, such as in the cases of high levels of learning compromising achievement, practice reducing cognitive and behavioral flexibility, generosity limiting achievement and psychological well-being, and empathy conflicting with justice. These findings are consistent with the Aristotelian perspective, which views virtues as interdependent goods that must be cultivated in balance. As Schwartz and Sharpe (2006) argued, "Virtues and strengths should not be treated in isolation from each other; they are not effective, in general, if exercised independently ... nurturing a single signature strength can produce deformations of character" (p. 380).

Differential sizes and ranges of positive and negative effects. A second general mechanism concerns differences in shapes, slopes, and thresholds for positive and negative effects. For example, consider the sensory delight of eating delicious food. As you continue to stuff yourself at a buffet table that offers a copious supply of many treats, two things happen: First, there is diminishing marginal benefit to the delicious tastes, whether through adaptation or some other process; second, you start to feel full—uncomfortably so. Early in your meal, there are no negative effects, but as you keep eating, a threshold is crossed, and negative effects start to appear. In addition, unlike the pleasurable effects, which diminish, the negative ones may escalate as they grow in magnitude. Indeed, Coombs and Avrunin (1977) suggested that as a general matter, "good things satiate and bad things escalate" (p. 224). The combination of diminishing marginal utility of positive influences and moderators of those influences whose threshold of activation differs from the positive effect and/or whose strength of activation increases nonlinearly can produce the inverted U.

Single nonmonotonic effects. A third general mechanism concerns the possibility that there is a single set of effects that is in and of itself nonmonotonic. For example, the Yerkes–Dodson Law (1908) suggests that increases in motivation enhance effort and narrow attention, which improves performance in simple tasks but impairs performance in complex tasks, for which narrowed attention can be a liability. The well-documented phenomenon of stereotype threat (e.g., Steele, 1997; Steele & Aronson, 1995) can be understood as resulting in part from Yerkes–Dodson type effects, as demonstrated by O'Brien and Crandall (2003). In their study, male and female students were told they would complete a series of math tests that either have shown gender differences (stereotype threat for women) or have not shown gender differences (control). The difficulty of the tests was varied so that half of the participants completed an easy set of math problems and the other half completed a difficult set of problems. Stereotype threat improved performance for women on the easy set of problems but harmed performance on the difficult set. Men were unaffected by the stereotype threat manipulation. What this example demonstrates is nonmonotonicity that results directly from the nonmonotonic effects of the variable under investigation (narrowing of attention) and not from either conflicting virtues or independent positive and negative effects that have different thresholds and different functional forms.

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Recommendations for Theoretical and Methodological Progress

These findings and mechanisms offer both a challenge and an opportunity for psychology. The challenge lies in complicating existing theoretical and empirical perspectives to account for the fact that few (if any) strengths, virtues, and positive experiences have monotonic effects on well-being and performance. The opportunity lies in gaining an enriched understanding of the full range of effects of positive traits, states, and experiences. We believe that psychologists can offer fundamental contributions to knowledge about human well-being and performance by building and testing theories that take seriously the inverted U and the concept of the Aristotelian mean. We recommend that psychologists frame their research programs and design their studies to answer three core questions.

1. How much of a given strength, virtue, or positive experience is too much? Theoretically, pursuing this line of inquiry will allow psychologists to identify the presence of inflection points for interventions and gain precision around understanding where they occur. For example, research has shown that gratitude exercises such as counting blessings and making "thank you" visits can improve psychological and physical health (Emmons & McCullough, 2003; Seligman et al., 2005). The important question now concerns how frequently and intensely such gratitude exercises should be undertaken to maximize well-being: What is the optimal frequency of gratitude exercises—weekly, daily, or hourly? Researchers should examine the points at which the effects become less positive (diminishing marginal utility) and turn negative (nonmonotonicity). Providing initial insights into this issue, Lyubomirsky, Sheldon, and Schkade (2005) described evidence that individuals who counted their blessings once a week achieved increases in well-being over 6 weeks, but those who counted their blessings three times a week did not. This finding suggests that to enhance psychological well-being, the optimal frequency of gratitude exercises is likely to fall below three times a week and is closer to one time per week.
2. Why does the focal strength, virtue, or positive experience have negative effects? Once inverted-U relationships and inflection points have been identified, the next logical step is to explain their occurrence. For instance, returning to the example of gratitude, multiple mechanisms may explain the potential negative effects of counting blessings several times per week. Counting blessings too frequently may focus attention on the past, distracting attention away from living life in the present. It may foster complacency, discouraging the pursuit of meaningful future goals. It may cultivate feelings of indebtedness, fueling guilt. Alternatively, it may reduce the novelty and significance of the activity: As Lyubomirsky, Sheldon, and Schkade (2005) speculated, people may "become bored with the practice, finding it less fresh and meaningful over time" (p. 126). Another possible explanation is based on the availability heuristic: The act of identifying blessings more frequently is more cognitively difficult than that of identifying blessings less frequently. Counting blessings more frequently may make it more difficult to recall events and experiences for which one is grateful. Individuals may use the cognitive difficulty of the exercise as a signal of the rarity of positive experiences in their lives and evaluate their lives less favorably as a result (Schwarz, 1998). Comparing these mechanisms will provide insight into the psychological processes that explain why, as gratitude exercises are undertaken numerous times per week, their costs may outweigh their benefits.
3. When does the focal strength, virtue, or positive experience have negative effects? As Nussbaum (1995) emphasized, Aristotle famously advocated what might be called the "priority of the particular." Not only was the mean not computable by formula, but it changed from one context to another. Courage in this battle might be recklessness in that one, and cowardice in a third. Following this model, psychologists must develop an understanding of the circumstances under which nonmonotonicity occurs. In addition to advancing scientific knowledge, an appreciation of context effects and boundary conditions can inform practical efforts to understand how to mitigate them. Armed with an understanding of mediating mechanisms, psychologists can conduct both observational and experimental studies that can shed light on moderators that delay or even eliminate inflection points. Continuing with the example of counting blessings frequently, if the explanation based on the availability heuristic and the ease of retrieval is correct, to maximize the benefits of counting blessings, researchers need to reduce the cognitive difficulty of recalling them, which might be accomplished by asking participants to first reconstruct major and recent life events before counting their blessings, supplement their own reflections by soliciting shared memories from friends and family members, or undertake the exercise in the absence of cognitive load and time pressure. Measuring or experimentally manipulating these and other moderators that are likely to influence the experienced cognitive difficulty of recall can extend theoretical and practical knowledge about the boundary conditions for the negative effects of counting blessings frequently.

Choice: An Exemplar of a Positive Experience With Nonmonotonic Effects

To illustrate these recommendations in the context of an established research domain, we turn to the growing literature on choice. Psychologists started with the assumption that more choice is better. Researchers showed that giving individuals choices has important well-being and performance benefits. For example, individuals undergoing shocks were more able to tolerate loud bursts of noise and persist on subsequent tasks when they were given the freedom of choice to press a button to

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relieve the pain, even though they did not exercise the choice (Glass & Singer, 1972). Elderly adults achieved greater health and lived longer when they had the opportunity to make choices about how to take care of plants (Langer & Rodin, 1976; Rodin & Langer, 1977). Organisms with choice had control, and a lack of control produced helplessness and clinical depression (Seligman, 1975). Autonomy emerged as one of the most robust predictors of well-being and performance, qualifying as a basic psychological need (Ryan & Deci, 2000). Choice allows people to pursue their values and express their identities (Schwartz, 2009). Because people are free to ignore choice possibilities when they do not want them, increasing the amount of choice people have seems to be what economists call a *Pareto efficient* move: It will make some people (those who want increased choice) better off but no one worse off. Said another way, it is reasonable to assume that the relation between choice and well-being *is* monotonic.

Recent research on choice has challenged this assumption, revealing that at high levels, choice can have negative effects. Iyengar and Lepper (2000) conducted a series of studies showing that providing too many choices can cause decision paralysis, leading individuals to experience dissatisfaction and disengage from the choosing process altogether. In a field study in a gourmet food store, participants who had the opportunity to taste 24 varieties of jams were less likely to purchase jams (3%) than those who had the opportunity to taste only 6 varieties (30%). In a laboratory experiment, participants were less satisfied with the prospect of receiving a box of chocolates, and less likely to select it, when it was part of an array of 30 options than when it was part of an array of 6. Since this initial demonstration, Iyengar, with various collaborators, has provided similar evidence from a wide variety of different domains, many of them far more consequential than jams or chocolates (e.g., Botti & Iyengar, 2004, 2006; Botti, Orfali, & Iyengar, 2009; Fisman, Iyengar, Kamenica, & Simonson, 2006). For example, adding mutual fund options to a 401(k) menu *decreases* rate of participation (Iyengar, Jiang, & Huberman, 2004). Participation rate drops 2% for each 10 options, even though, by failing to participate, employees pass up significant amounts of matching money from their employers.

Although there are no doubt limits to the choice overload phenomenon that remain to be determined and conditions under which it does not seem to hold (Chernev, 2003), it now seems clear that in a broad range of circumstances, people find a large number of options paralyzing rather than liberating. Indeed, several studies have shown a nonmonotonic, inverted-U-shaped relationship between the number of options available and both the likelihood of choice (Shah & Wolford, 2007) and satisfaction with one's choices (Reutskaja & Hogarth, 2009). Building on this evidence, researchers have begun to address several important questions about the negative effects of choice.

1. How much choice is too much? Recent meta-analytic evidence suggests that the optimal number of choices appears to fall in the range of two to four (Patall, Cooper, & Robinson, 2008; see also Shah & Wolford, 2007). Later in this article, we discuss how the optimal number will undoubtedly vary as a function of the cultural and temporal context, the immediate situation, and the individual decision maker. However, identifying a range for the average size of the ideal option set provides valuable information about where the inflection point for choice effects most often occurs.
2. Why does excessive choice have negative effects? Researchers have identified three psychological processes that appear to mediate the negative effects of excessive choices on satisfaction. The first mechanism is regret: Providing more options makes it easier to imagine that one could have made a better choice, triggering tantalizing second thoughts and buyer's remorse (Schwartz, 2000, 2004; Schwartz et al., 2002). As Landman (1993) explained, "regret may threaten decisions with multiple attractive alternatives more than decisions offering only one or a more limited set of alternatives" (p. 184). Such regrets are especially salient when decisions are reversible, an opportunity that—although it offers the prospect of improving one's lot—actually decreases satisfaction by leaving individuals wondering about what might have been (Gilbert & Ebert, 2002). The second mechanism is missed opportunities: Each option added has attractive features that must be rejected when making a choice (Brenner, Rottenstreich, & Sood, 1999). This fact reduces the value associated with each option, as choosing it requires that one forgo desirable features of other available options. The third mechanism is rising expectations: More choices offer the promise of achieving better outcomes, which means that experiences are evaluated against a higher standard (Eckersley & Dear, 2002; Schwartz et al., 2002). Providing more options thus increases the risk of disappointment. After all, satisfaction is a function of the degree to which an experience meets expectations (e.g., Diener & Seligman, 2004; Michalos, 1980).
3. When does excessive choice have negative effects? Once knowledge began to accumulate to document the existence of choice overload and the mechanisms that account for it, researchers began to investigate the moderators that affect whether and when choice overload emerges. A recent meta-analysis called attention to two key moderators: Choice overload is less likely to occur when decision makers have expertise or strong preferences (Scheibehenne, Greifeneder, & Todd, 2010), both of which appear to enable more effective sorting and categorizing of options available. Indeed, Scheibehenne et al. (2010) reviewed other studies that suggested that increasing choices is less likely to decrease satisfaction under the following circumstances: if the options are presented in categories, which helps to simplify the decision and prevent overload (Mogilner, Rudnick, & Iyengar, 2008); if the options presented are not complex, which helps to reduce the cognitive effort involved in choosing (Reutskaja & Hogarth, 2009); if adequate time for evaluating options is provided,

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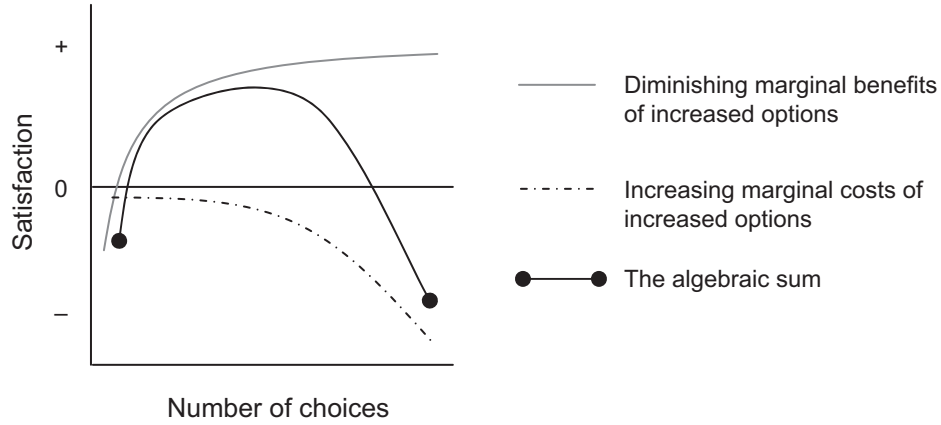

Fig. 1. Illustrating the inverted-U-shaped relationship between number of choices and satisfaction.

which helps to reduce overload (Haynes, 2009; Inbar, Hanko, Botti, & Gilovich, 2008); if participants are not held accountable for choices, which reduces pressure associated with responsibility for finding a good justification (Scheibehenne, Greifeneder, & Todd, 2009); if the commitment to choosing occurs prior to the selection of the option itself, which simplifies the decision by allowing an absolute "yes" or "no" evaluation to precede the more complex relative comparison of options (Gao & Simonson, 2008); and if the options in the set are high quality, which reduces the risk of making a bad choice (Chernev, 2008). These studies shed light on the factors that determine the presence of the inflection point and the number of choices at which it occurs. It remains unknown whether choice overload operates only within a domain or extends across domains, although we suspect the latter (Vohs et al., 2008, offered some empirical support for this possibility).

How Choice Can Be Both Good and Bad

We acknowledged at the beginning of this section that freedom, autonomy, and choice are essential to human well-being. We then proceeded to review evidence that there can be too much of a good thing. The question we address now concerns how choice can be good and bad. Our admittedly speculative model is inspired by Coombs and Avrunin (1977). A visual illustration of this relationship is depicted schematically in Figure 1. The y-axis in the figure depicts satisfaction, and the x-axis depicts number of choices, which could mean either number of options in a specific domain (e.g., styles of jeans) or number of options across multiple domains (clothes, electronics, investments, jobs, romantic relations, etc.). The gray curve captures the positive relation between choice and well-being. With no choice, life is essentially infinitely bad. As choices increase, welfare increases, but the relation is not linear: There are diminishing marginal benefits to added options. A point is reached at which added options add little.

The dotted curve is meant to capture all of the negative effects of choice discussed earlier. When there are few options, there are no costs, but as options increase, negative effects due to regret, missed opportunities, and heightened expectations appear, and as the choice set grows larger, these negative effects escalate. Thus, although there is diminishing marginal utility to added options, there is increasing marginal disutility to added options (see Coombs & Avrunin, 1977). The point of drawing two separate curves is that the psychological benefits of choice and the psychological costs are different, and independent. As McGuire (1997) argued, an "inverted-U relation . . . can be creatively interpreted as the resultant of two opposed mediating processes, both monotonic" (p. 23).

Finally, the black curve with circles at the endpoints, the algebraic sum of the two preceding curves, is intended to show the psychological state that results when the processes are combined. Initially, adding options improves well-being, but a point is reached where the magnitude of the negative effects is large enough that the curve changes direction. Indeed, as we have drawn the curves, an inflection point may be reached where the negative effects of choice so overwhelm the positive effects that the resulting psychological state is worse than neutral. It is a significant theoretical, empirical, and practical task to locate the "sweet spot," the inflection point along the x-axis where well-being is highest, and the aforementioned research suggests that this point most often occurs in the range of fewer than 10 options (Patall et al., 2008; Shah & Wolford, 2007).

New Frontiers for Inverted-U Relationships

Beyond choice and the other topics that we have covered, in what other domains might we expect to see inverted-U relationships? Interestingly, we located few studies that explicitly examined the possibility of inverted-U relationships for Peterson and Seligman's (2004) virtues of transcendence and temperance. We see studying the costs of these two virtues—and

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their mediating mechanisms and boundary conditions—as a promising new direction for psychology.

Costs of Transcendence and Temperance

Strengths that align with the virtue of transcendence include appreciation of beauty and excellence, gratitude, hope, humor and playfulness, and spirituality (Peterson & Seligman, 2004). We noted some possible negative effects of extreme gratitude earlier, which are rarely studied (Grant & Gino, 2010), and hope may have costs that resemble those of optimism and self-efficacy. We encourage psychologists to study whether high levels of humor and playfulness have costs in terms of reducing seriousness and conscientiousness. It may also be the case that at very high levels, appreciation of beauty can lead to the objectification of self and others (e.g., Crocker, Luhtanen, Cooper, & Bouvrette, 2003; Fredrickson & Roberts, 1997), and the appreciation of excellence can lead to an excessive focus on extrinsic rewards, especially in societies that define excellence in terms of financial success and fame (e.g., Grouzet et al., 2005; Kasser & Ryan, 1993).

Strengths that align with the virtue of temperance include forgiveness and mercy, humility and modesty, prudence, and self-control (Peterson & Seligman, 2004). Psychologists have begun to raise the possibility of costs of two of these strengths. One such strength is forgiveness, which may involve the cost of overlooking dangers and making oneself vulnerable to future harm, particularly if the transgressors lack trustworthiness and possess power (Exline, Worthington, Hill, & McCullough, 2003). The other such strength is self-control.

The Dark Side of Self-Control

Psychologists have speculated about possible costs of self-control, suggesting that individuals may show patterns of over-control, manifested in psychopathologies such as obsessive–compulsive disorder and eating disorder (for a review, see Tangney, Baumeister, & Boone, 2004). However, research has yet to provide empirical evidence of any costs of high self-control. Tangney et al. (2004) conducted two studies of college students and did not find nonmonotonic relationships of self-control with grade point average, psychopathology, self-esteem, binge eating, alcohol abuse, interpersonal relationships, social skills, attachment security, or emotional reactions. One possible explanation is that self-control, unlike most other virtues, simply does not have costs. Tangney et al. (2004) proposed that ''rigid 'overcontrolled' individuals (e.g., those with obsessive–compulsive disorder, anorexia) ... lack the ability to control their self-control. In contrast, individuals genuinely high in self-control have the ability to exert self-control when it is required ... and to suspend self-control when it is not'' (p. 314).

It should be noted that this quote, essentially equating self-control with self-regulation, has the notion of the Aristotelian mean built into it. Optimal self-regulation means the right amount for the current context; one cannot have too much of the right amount. If self-control is understood as self-regulation, then it may display no nonmonotonicity, principally because the nonmonotonicity of self-control is incorporated in the idea of self-regulation. An alternative explanation is that particular features of the Tangney et al. (2004) scales precluded the discovery of negative effects of high self-control. For example, the self-control scales that they developed may not capture the full range of the phenomenon, creating range restriction problems that limited their ability to detect nonmonotonicity.

We encourage psychologists to conduct further research to examine whether self-control can in fact have negative effects. Beyond overcontrol, another possible mechanism is that individuals with very high levels of self-control have such flat temporal discount functions that they permanently delay gratification. A flat temporal discount curve, popularly described as the *rat race* phenomenon, may have negative ramifications for well-being. This phenomenon may be especially common in professions such as law, investment banking, and medicine, in which Americans work such extreme hours that they lack time to spend the money they earn. Difficulties in affective forecasting (Wilson & Gilbert, 2005) may lead such individuals to predict erroneously that delaying gratification will be in the interest of their long-term happiness, even if it requires short-term sacrifices. Put simply, individuals with extreme self-control may never consume and thus never experience pleasure. They may also come to pursue meaning at the expense of happiness (see McGregor & Little, 1998) and become highly invested in goals, which is associated with excessive worrying (Pomerantz, Saxon, & Oishi, 2000).

In addition, Frank (1988) has argued persuasively that it is the potential loss of self-control that makes threats of retaliation for transgression credible and thus promotes social coordination in the absence of external mechanisms of enforcement. If, for example, a person with whom you are transacting business knows that you will ''cut off your nose to spite your face'' to get even for a violation of an agreement, that person will be less likely to violate the agreement. In the well-studied ultimatum game, in which one player controls a resource and offers a second player a split and the second player can accept or reject the offer, it is well established that offered splits are close to 50–50 (e.g., Rabin, 1998). Although the recipient will be better off with something than with nothing, the threat that the recipient will punish the person in control of the resource is credible enough to encourage roughly equal distribution. We do not wish to suggest that the threat of punishment due to the loss of self-control is the only reason for equal offers—only that it contributes to and encourages a concern about ''fairness'' on the part of the offerer.

No Such Thing as an Unmitigated Good?

This debate about the potential costs of high self-control raises a broader question about whether there are any virtues for which costs do not emerge at high levels. This philosophical question can be informed, if not adjudicated, by psychological

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research. Providing insight into this issue in the work domain, Warr (2007) has proposed a "vitamin" model to explain two different types of mental health effects that may emerge at high levels of favorable job characteristics. He argues that some job characteristics resemble vitamins A and D in that they have negative effects above a certain level (the inverted U). He predicts that other characteristics, however, resemble vitamins C and E in that they have no incremental value but also cause no harm above a certain level (a diminishing marginal utility function that eventually flattens). It remains to be seen whether there are any virtues that take the form of the latter function. In addition to self-control, wisdom is a plausible candidate; Aristotle viewed wisdom as the cardinal virtue that enabled individuals to find the mean and keep the other virtues in balance (see also Baltes & Staudinger, 2000; Schwartz & Sharpe, 2006; Sternberg, 1998).

Beyond strengths and virtues, we hope researchers will more systematically study the costs of other positive experiences. Two plausible candidates for inverted-U-shaped relationships are flow and mindfulness. On the one hand, flow has been equated with optimal experience (Csikszentmihalyi & Csikszentmihalyi, 1988) and mindfulness with heightened mental and physical health (for a review, see K.W. Brown, Ryan, & Creswell, 2007). On the other hand, at very high levels, both flow and mindfulness may involve an excessive focus on the present at the expense of planning for the future (e.g., Zimbardo & Boyd, 1999). Another candidate is integrity, in light of research suggesting that low self-monitors tend to emphasize principles over pragmatics, which involves the costs of failing to pick their battles and compromising relationships (Gangestad & Snyder, 2000).

Finding the Mean

It will also be worthwhile for psychologists to gain a deeper understanding of how moderate and high levels of particular phenomena interrelate. According to Aristotle's formulation, the differences between vices of deficiency, vices of excess, and virtues are quantitative in nature—matters of degree: "The equal is an intermediate between excess and defect … that which is equidistant from each of the extremes" (Aristotle, trans. 1999, p. 26). This idea suggests that the studies we reviewed on numbers of hours volunteered and levels of happiness are appropriate for capturing the Aristotelian mean, which applies qualitatively distinct labels to attributes that differ only along quantitative scales. From this viewpoint, the mean or right amount of a virtue varies by context, and imposing precise boundaries for distinguishing between vice and virtue is a relatively arbitrary choice that involves making categorical judgments along fuzzy continua. However, some psychological research points toward an alternative possibility: Vices and virtues differ in kind as qualitatively distinct entities. For example, whereas Aristotle viewed pride as the intermediate point between humility and vanity, psychologists have identified authentic and hubristic (vain) forms of pride that appear to be qualitatively distinct—they are associated with different nonverbal expressions, personality predispositions, attributional causes, emotional experiences, and social and behavioral consequences (for a review, see Tracy & Robins, 2007). Aristotle might have argued that when pride is felt too strongly, it shifts from authentic to hubristic, and we hope to see future research disentangle these types of issues by exploring whether and when quantitative differences become qualitative.

Methodological Implications

Our arguments have three core methodological implications for research design. Each of these steps can require considerable work, but we believe it is work well worth doing. First, although studies on overlearning (Langer & Imber, 1979), choice (Iyengar & Lepper, 2000), and gratitude (Lyubomirsky, Sheldon, & Schkade, 2005) have used experimental designs to demonstrate negative causal effects of high levels of positive experiences, most of the evidence that we discovered was correlational. More experimental research on nonmonotonic effects is needed in which psychologists vary treatments at multiple levels of frequency or intensity. For example, to understand the nonmonotonic effects of gratitude exercises and identify the optimal design of such exercises, it is necessary to include multiple treatment groups that vary in the number of blessings counted and the frequency of undertaking the exercise. Second, in observational studies, sampling is especially critical. When researchers fail to discover nonmonotonic relationships, the methodological artifact of range restriction may be the culprit. To maximize the probability of identifying inverted-U relationships, researchers need to sample on the full range of the independent and dependent variables. Third, in both experimental and observational studies, careful attention to developing measures that capture the full range of the constructs of interest is required (see Bass, Cascio, & O'Connor, 1974, and Schwarz, 1999). Indeed, given the apparent pervasiveness of nonmonotonic effects, a good rule of thumb for study design may be to include a wide enough range of values of the independent variable to enable a judgment of when nonmonotonicity occurs rather than whether nonmonotonicity occurs.

Conclusion

In conclusion, we believe that the search for the Aristotelian mean represents an opportunity for psychologists to answer fundamental questions about the limits of positive experiences. The inverted U is a widespread phenomenon in psychology, and we believe it deserves more attention in psychology writ large and in positive psychology especially. Along with providing invaluable insights about the optimal levels of strengths and virtues, this endeavor may offer a more balanced perspective on the boundaries of positivity that will appease critics in both the scholarly community (e.g., Fineman, 2006; Held, 2002; Norem & Chang, 2002) and the popular press (e.g., Ehrenreich, 2009). In this way, an exploration of the inverted U may serve to unite psychologists—positive, negative, and neutral—in a

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quest to understand the complete effects of positive traits, states, and experiences.

Notes

1. Because nonmonotonocity is consistent with a central concept of Aristotle and because Aristotle is the inspiration for much of positive psychology, our discussion is mostly organized around key ideas in positive psychology. However, we want to be clear at the outset that this merely illustrates the phenomenon; it does not exhaust it. When possible, we focus on experimental studies that facilitate causal inferences. In the remaining cases, we focus on correlational studies—some longitudinal and others cross-sectional—that show nonmonotonic, inverted-U-shaped relationships and are suggestive of, albeit not conclusive about, costs of virtues, strengths, and other positive phenomena.
2. The effects of optimism may turn negative more quickly in deliberative mind-sets, in which some degree of realism is important for setting goals, than in implementation mind-sets, in which optimism is critical for encouraging goal pursuit (Taylor & Gollwitzer, 1995), focusing attention on small wins (Weick, 1984), and planning task completion (Buehler, Griffin, & Ross, 1994).

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