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Lyubomirsky, Sonja

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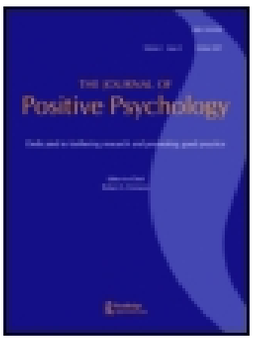

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Revisiting the Sustainable Happiness Model and Pie Chart: Can Happiness Be Successfully Pursued?

Kennon M. Sheldon[a,b] and Sonja Lyubomirsky[c]

[a]University of Missouri, Columbia, MO, USA; [b]National Research University Higher School of Economics, Moscow, Russian Federation; [c]University of California, Riverside, CA, USA

ABSTRACT

The Sustainable Happiness Model (SHM) has been influential in positive psychology and well-being science. However, the 'pie chart' aspect of the model has received valid critiques. In this article, we start by agreeing with many such critiques, while also explaining the context of the original article and noting that we were speculative but not dogmatic therein. We also show that subsequent research has supported the most important premise of the SHM – namely, that individuals can boost their well-being via their intentional behaviors, and maintain that boost in the longer-term. However, such effects may be weaker than we initially believed. We describe three contemporary models descended from the thinking embodied in the SHM – the Eudaimonic Activity Model, the Hedonic Adaptation Prevention model, and the Positive Activity Model. Research testing these models has further supported the premise that how people live makes a difference for their well-being.

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In a widely cited article, Lyubomirsky, Sheldon, and Schkade (2005) proposed a heuristic framework for understanding the influences on well-being. The Sustainable Happiness Model, as illustrated in the now well-known pie chart, distinguished among three overlapping kinds of influences: inherent genetic predispositions, current life circumstances, and current intentional activities. Lyubomirsky et al. also provided, based on certain starting assumptions and a non-exhaustive review of the literature of that time, initial estimates concerning the relative importance of the three factors in impacting chronic happiness levels: approximately 50% for genetic factors, 10% for circumstantial factors, and the remaining 40% for volitional or intentional activity factors. Figure 1 illustrates this basic pie chart.

Based on their review, Lyubomirsky, Sheldon et al. (2005) suggested that there is considerable potential for people to take action to influence their own happiness. If happiness is not fully determined by a person's genetics and circumstances, then there must be something left over for intentional behavior. At the time, these conclusions supported the nascent science of positive psychology, helping to justify its search for new ways to help people activate their potentials. The conclusions also dovetailed well with Thomas Jefferson's contention that the right to 'pursue happiness' must be foundational in a just society, and were well aligned with Western and individualist ideological assumptions more generally.

Today, however, the pie chart diagram appears to have outlived its usefulness (for recent critical reviews, see Bergink, 2015; Brown & Rohrer, 2019; Kashdan, 2015; Krueger, 2015). Brown and Rohrer (2019) have provided the most elaborated analysis, especially of the initial percentage estimates we provided. These critiques, with which we mostly agree, have provided us with an opportunity to articulate our current thinking. However, rather than addressing such criticisms in detail here, in this article we take a broader perspective. Accordingly, we first revisit the context in which the chart was proposed, point out the cautiousness with which we originally proposed it, and remind readers of our original goal in proposing it – namely, to show that it is theoretically possible for people to influence their own happiness via their intentional behaviors. Our reasoning was that if happiness is not completely determined by one's genetic endowment (which is, after all, relatively constant over time), then happiness must fluctuate over time (as it clearly does). We further argued that patterns of behavioral activity provide one logical source of influence upon those fluctuations, and perhaps the most important influence, given the relatively weak effects that had been observed at that time within mainly Western cultures for many demographic-type variables, such as income, marital status, gender, and ethnicity.

Today, we know this basic idea to be correct. The SHM, and some of the assumptions embodied in the

CONTACT Kennon M. Sheldon SheldonK@missouri.edu
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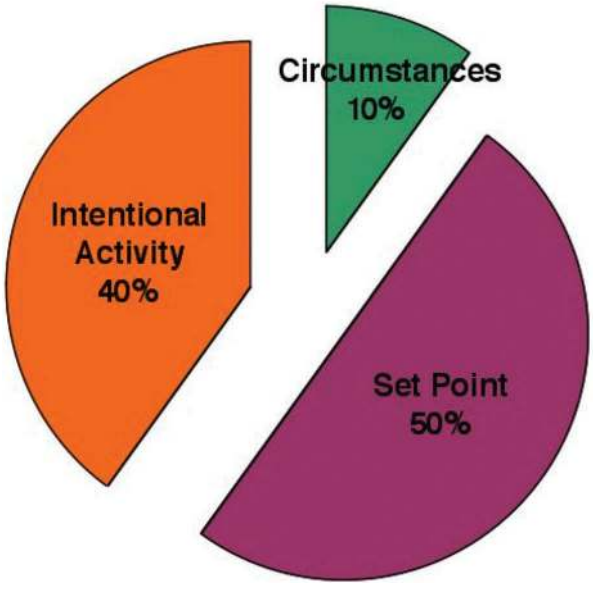

Figure 1. The pie chart aspect of the sustainable happiness model (Lyubomirsky et al., 2005).

pie chart, has informed both of our research efforts and has given rise to several more nuanced models, including our joint Hedonic Adaptation Prevention model (HAP; Sheldon & Lyubomirsky, 2012), Sheldon's Eudaimonic Activity Model (EAM; Sheldon, 2017), and Lyubomirsky's Positive Activity Model (Lyubomirsky & Layous, 2013). This more recent research affirms that people *can* affect their own happiness, via their deliberate efforts. Admittedly, however, these effects tend to be smaller than we initially believed. They are also difficult to investigate via double-blind experiments, the gold standard of psychological research, because the successful pursuit of happiness typically requires awareness, knowledge, and intentional buy-in by participants.

As a way of considering the context in which we originally presented the Sustainable Happiness Model, let us first address a critical question: What does it mean to say that a person has achieved a stable (and perhaps sustainable) change in well-being? Figure 2 illustrates by showing three successive measurements of subjective well-being (SWB; namely, high positive affect and life satisfaction, and low negative affect; Diener, Suh, Lucas, & Smith, 1999).

As the figure shows, at least three waves of data are required to demonstrate a stable change in SWB, in which a person's happiness level first goes up, and then stays up. Importantly, the strong version of 'happiness set-point' theory (Lykken & Tellegen, 1996), to which our original article was a response, posits that staying up is simply not possible: After any fluctuation in their well-being, either up or down, people must always return to their characteristic set point. To our knowledge, ours was the first theoretical article to address this sustainable change issue. It also attempted to carve out a place in the happiness equation for intentional personality processes, which could potentially operate in addition to, in concert with, or in spite of, peoples' genetic constitutions (Little, 1999).

Still, it is worth noting that we were quite circumspect in our proposals. We stated that we were focusing on the genetic, circumstance, and activity categories because 'they have historically received the majority of attention in the well-being literature' (p. 116) and not, by implication, because these categories exhaustively described all the possible influences on happiness. On the same page, we also said that our numerical estimates were

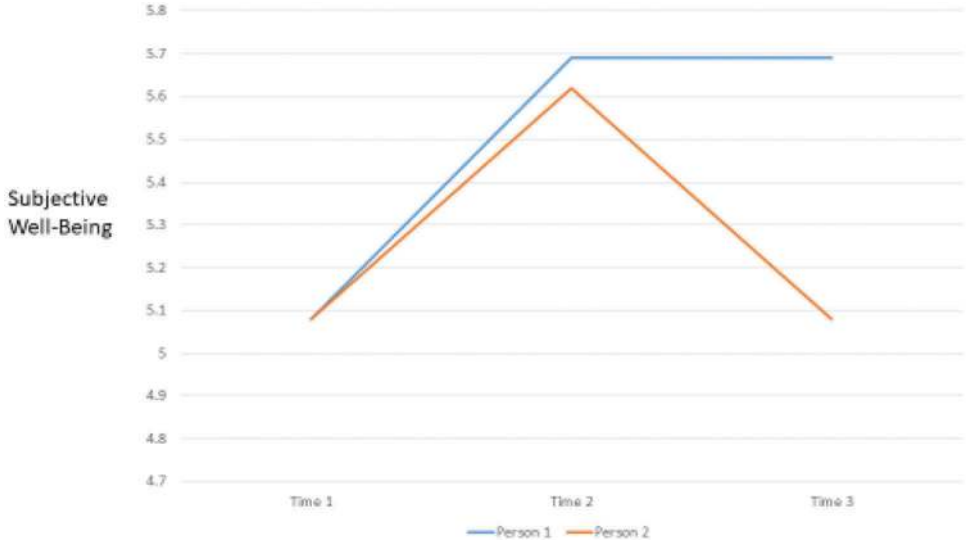

Figure 2. Illustrating a stable change in well-being.

'suggestions,' were 'approximate,' and were based on (then scarce) existing information, derived primarily from mere cross-sectional studies. In discussing intentional activity effects, we wrote that they offer a 'potential' and 'arguably the most promising' route to happiness, which might account for 'as much as 40% of the variance.' On p. 118, we further stated that activities 'seem to offer the best potential route' to sustainable happiness, based on the well-known fact that people readily adapt to unchanging circumstances. Although assigning numbers to the categories was risky on our parts, clearly scientific progress consists sometimes of engaging in speculation, which can open up new questions or possibilities, which must then, by necessity, be tested and fine-tuned. We believe this constructive process is precisely what is happening today, as our early speculations have a) attracted a great deal of scientific interest and attention, b) stimulated much new research, and c) are being corrected and refined, with the help of Brown and Rohrer (2019) and others.

In support of the most general claim of the SHM – that intentional behavior can make a difference – Figure 3 provides the results of an early experimental study (Sheldon & Lyubomirsky, 2006). This study found that making a randomly assigned *activity* change had a larger and more sustainable effect on well-being than making an assigned *circumstance* change. When people change their intentional behavior – that is, doing something new that takes effort – they have a better chance of boosting their well-being and maintaining that boost than when they merely change a factual circumstance (such as moving into a new apartment, buying a car, or asking for and receiving a raise). This is because people are less likely to experience hedonic adaptation in response to life changes that involve continued motivated behavior, and conversely, are more likely to adapt to changes that merely substitute one stable circumstance for another. Later in this article, we discuss our HAP model (Lyubomirsky, 2007; Lyubomirsky, 2010; Sheldon, Boehm, & Lyubomirsky, 2012; Sheldon & Lyubomirsky, 2012), which specifies in detail the effortful processes required to maintain the initial boost derived from a positive circumstantial change.

Despite such promising early results, one important insight we have gained from our own (and others') intervention research is how difficult it is to 'induce' people to become happier. It seems that people have to create life shifts – or changes in cognition and behavior – for themselves, which can require considerable motivation and effort (Lyubomirsky, Dickerhoof, Boehm, & Sheldon, 2011). Indeed, in the Sheldon and Lyubomirsky (2006) study, some participants reported *not* making the change that we requested they make. Not surprisingly, these participants did not display the pattern shown in Figure 3. This provided an early illustration of the theme mentioned above – namely, that interventions designed to change a person's happiness require intentional buy-in by participants, and that merely assigning people to an activity condition may not be effective. We will return to this issue later.

Brown and Rohrer (2019) criticized our initial estimate that 40% of the variation in happiness is due to intentional activity. Based on our research of the last 15 years, we agree that this figure was likely an over-estimate. Although positive psychology interventions (also known as positive activity interventions) have been shown to have real effects, a recent authoritative meta-analysis revealed that these effects are rather small

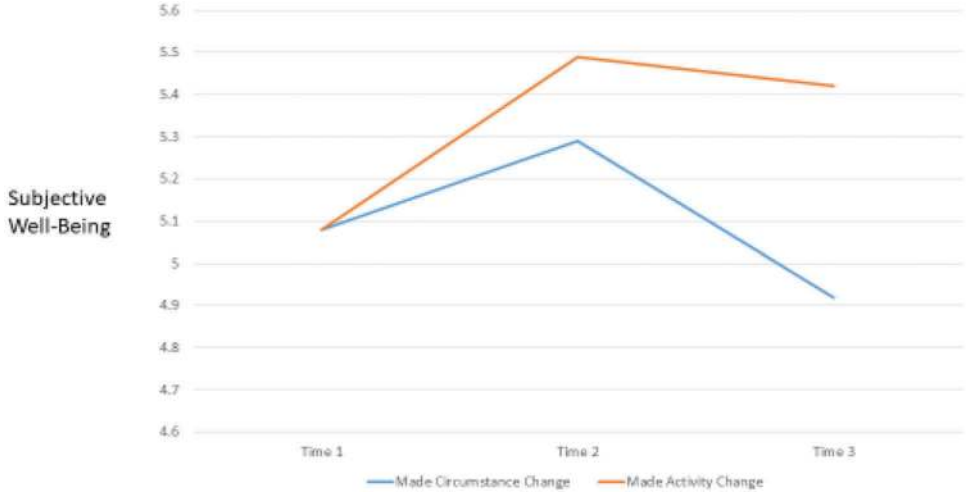

Figure 3. Longitudinal effects of making an assigned activity change compared to making an assigned circumstance change (Sheldon & Lyubomirsky, 2006).

(White, Uttl, & Holder, 2019; cf. Bolier et al., 2013; Sin & Lyubomirsky, 2009). As another indication of the limitations of activity-based effects on well-being, attaining or making good progress in self-generated personal goals has been shown to reliably boost happiness, but with an uncorrected meta-analytic effect of only $\rho = .43$ (Klug & Maier, 2015) or approximately 15% of the variance. These are not trivial effects, but they are not large either. Again, we believe this is in part because of the difficulty of taking action to change oneself or one's happiness levels, and also the difficulty of maintaining and diversifying such behavioral changes.

Still, such hedonic shifts can and do happen. Figure 4 illustrates what such a change looks like: At a particular point in time, the individual starts doing something different, which reliably elevates their chronic SWB. (As shown in the figure, shorter-term mood fluctuations still occur around this new baseline.) Maybe they meet a wonderful new life partner, or finally find a job that expresses and develops their passions. Thus, it might be more accurate to say that people have a *range* of potential well-being rather than a set *point* of well-being. Of course, any such range has a central tendency. A key point of our research has been to show that regression back towards one's prior central tendency might be forestalled, perhaps in the long-term, as a function of one's life choices and behavioral activities.

Consider an identical twin who is consistently happier than her matched twin, despite their nearly identical genetic inheritance and similar life circumstances. Perhaps this is because the first twin has healthier or more prosocial goals and values, has a more optimistic attitude towards her life, or spends her time in more intrinsically satisfying ways. In any case, the relative unhappiness of the second twin need not define her forever; she, too, could make life changes that lead to higher chronic SWB. In this case, *both* twins would have discovered how to organize their lives to remain happier than they would otherwise be. Indeed, such changes are the theme of many novels, films, and plays.

It takes both a will and a proper way

Again, however, such changes appear to require considerable intentionality and effort. Those who can muster resources and energies toward a life-improvement goal are more likely to benefit than those who cannot. Illustrating this principle, in an 8-month long quasi-experimental study, we showed that participants who signed up for an advertised 'happiness intervention' study later experienced greater increases in well-being compared to participants who signed up for the same study instead advertised as a 'cognitive exercises' study (Lyubomirsky et al., 2011). Also, independently of condition (happiness intervention vs. cognitive exercises), participants who invested more effort into their assigned positive activities (as judged by independent raters) also reported greater improvements in their well-being.

These results suggest that randomized controlled trials, which passively assign people to engage in activities selected by the investigator, are not likely to obtain impressive effect sizes – especially in the long term. This is because participants in such trials may not find their assignment desirable, may not believe in the efficacy of the intervention, or may not even realize that they are in an intervention. Although such psychological factors may play a small to negligible role in certain types of trials (e.g. pharmacological or physical exercise), they appear to be critical to the project of constructing

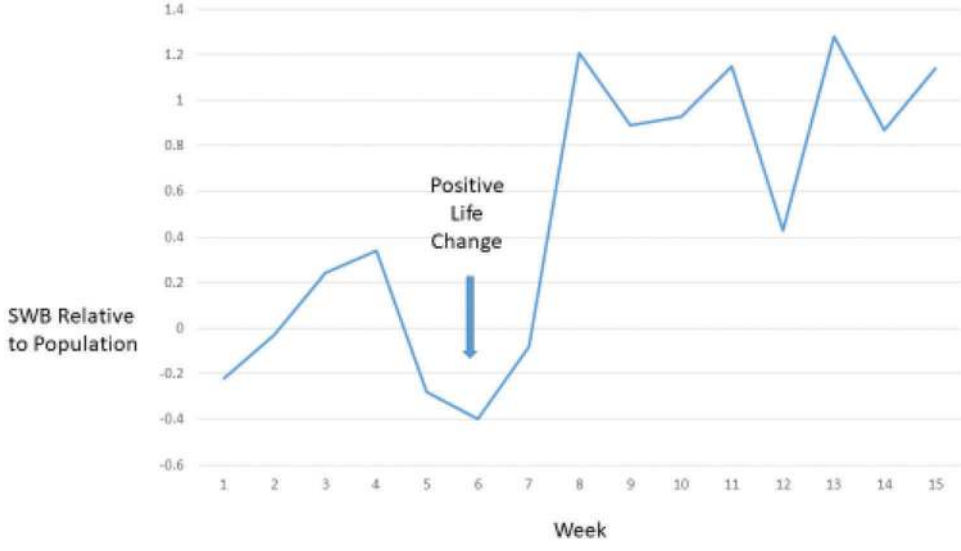

Figure 4. Before and after a life change that reliably elevates an individual's SWB.

a happier life. Indeed, it is difficult to imagine why an individual would choose to initiate, invest effort in, and keep investing effort in an endeavor whose goal they do not understand and endorse.

The fact that only participants who self-selected into a happiness study obtained benefits from the study might be taken as evidence of mere placebo effects. Of course, this is an important problem for well-being science, just as it is for all treatment research, medical and psychological. Belying this explanation, however, is an important moderator effect that we discovered. Specifically, we also manipulated a second factor – that is, type of activity assigned (writing gratitude letters, visualizing optimistic futures, or listing activities of the last week). Participants who self-selected into a 'happiness intervention study' only became happier in the gratitude and the optimism conditions, and not in the neutral listing condition, despite the fact that the listing activity was also described as potentially beneficial for participants. A similar interaction emerged for the coded 'effort' variable – effort only predicted boosts in happiness within the two positive activity conditions, and not in the control condition. In sum, this study indicated that it takes both a 'will' and a 'proper way' to become happier (Lyubomirsky et al., 2011).

Two other studies are worth briefly mentioning in this context. Sheldon and Houser-Marko (2001) reported data from a sample of Missouri first-year students, showing that participants who exerted effort and achieved their self-set goals during their first semester in college experienced improved well-being at the end of that semester. These improvements persisted across the second semester as well. Sheldon (2008) revisited the same sample during their senior year, finding that first-year goal attainment still predicted senior well-being, 3 years later. Furthermore, these studies also found that the quality of activity mattered (proper 'way'), as students who initially selected 'self-concordant' goals best attained those goals (Sheldon & Houser-Marko, 2001).

How can people maintain the boost from a positive life change? The eudaimonic activity model

We now turn to three conceptual models that have been derived from the 2005 Lyubomirsky et al. paper. To explain the first, we revisit Figure 4 and ask – how *do* some people actually manage to reach the top half of their potential happiness range, and stay there? The answer seems to be – by creating and maintaining a steady inflow of positive experiences, experiences that interest, inspire, connect, and uplift them. Their lives are full of deeply satisfying moments, which provide them with near-daily rewards. Importantly, such lives require a considerable investment of effort; high SWB is like a bicycle tire that needs continued pumping to stay inflated, or a fire that needs continued fuel to burn brightly. Joyful lives involve more than mere contentment or peacefulness, requiring people to 'live large' in some way. The sum total of having many positive experiences, small and large, exerts bottom-up effects on the person's chronic well-being level, as measured and sustained over time.

Figure 5 presents the current Eudaimonic Activity Model (EAM; Martela & Sheldon, in press; see also Sheldon, 2013, 2016, p. 2018), which aims to explain one important aspect of joyful lives. The model posits that engaging in eudaimonic, growth-promoting goals and intentional behaviors helps people to satisfy their basic psychological needs, which results in elevated SWB. The concept of *eudaimonia* comes originally from the ancient Greeks, especially the writings of Aristotle (2012), concerning good and fulfilling ways of living, the nature of human virtue, and the ultimate causes of personal happiness (Ryan & Martela, 2016; Waterman, 1993). The term is employed by psychologists to describe a very large category of admirable values and behaviors.

The broadest purpose of the EAM is to help resolve definitional ambiguities in well-being research, including the lack of clarity regarding the popular eudaimonic well-being construct (EWB), the apparent conflict between EWB and SWB, and the logical relationship between EWB and SWB. Space precludes discussing these issues here; suffice it to say that the EAM was proposed in part as a reaction to findings that striving for SWB directly does not work (Sheldon, Corcoran, & Prentice, 2019; van Zyl & Rothmann, 2014). Instead, a great deal of research demonstrates that pursuing goals and activities broadly classifiable as 'eudaimonic' (i.e. virtuous, connecting, expansive, integrative) tends to bring SWB, as a kind of side effect. Furthermore, researchers have identified a mediating factor: Eudaimonic goals and activities succeed by increasing a person's levels of competence, autonomy, and relatedness (i.e. their levels of basic need satisfaction), which in turn increases their levels of SWB (Ryan & Deci, 2017). As long as the source of elevated need satisfaction remains constant, presumably because of the person's continued eudaimonic activity, then the elevated SWB can be sustained.

Note that the EAM is consistent with the North American idea that people can and perhaps should 'pursue happiness,' and provides some ground rules for doing so. Obviously, many people spend their whole

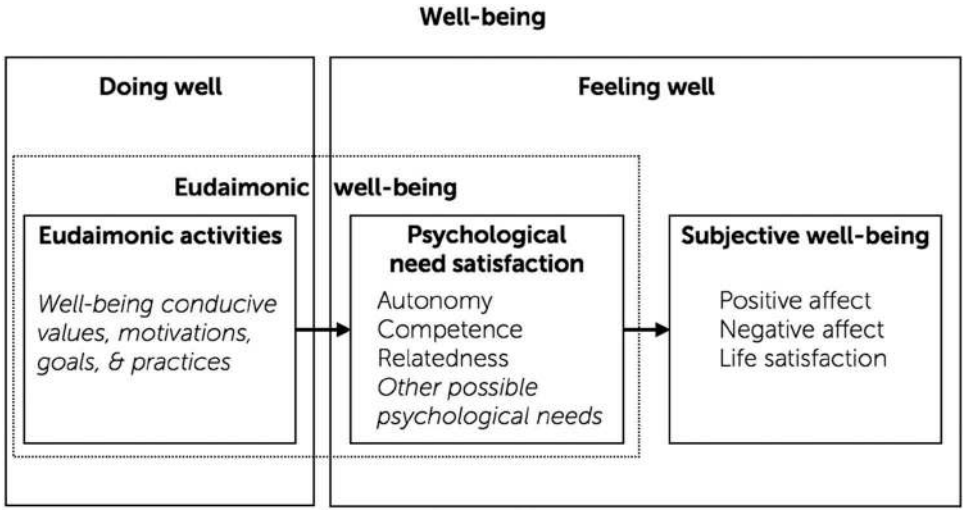

Figure 5. The eudaimonic activity model (Martela & Sheldon, in press; Sheldon, 2017).

lives in such pursuits, with little apparent success, but that does not mean that the pursuit is not worthwhile. It is also worth remembering that it is the *opportunity* to conduct personal happiness experiments that is guaranteed by the U.S. Declaration of Independence, and not happiness itself.

To summarize, the EAM specifies that the pursuit of happiness involves trying out different kinds of goals, values, behaviors, and activities, to determine which ones bring one satisfaction and happiness. Ironically (and reassuringly), the best happiness-boosting behaviors tend be the ones that focus on long-term self-improvement and on deepening connections with others, just as most lay and eudaimonic theories of 'a life well-lived' have long proposed.

Direct support for the EAM includes findings that psychological need satisfaction mediates the effects of many eudaimonic-type variables on SWB, including achieving self-concordant versus less concordant goals (Sheldon & Elliot, 1999), having intrinsic versus extrinsic aspirations (Niemiec, Ryan, & Deci, 2009), having correspondence between actual time use and ideal time use and having a more balanced lifestyle (Sheldon, Cummins, & Khamble, 2010), expressing one's authentic self (Sheldon, Gunz et al., 2012), being assigned to pursue motive-congruent (Sheldon & Schuler, 2011) or need-congruent (Sheldon, Cummins et al., 2010) goals rather than alternative goals, and engaging in prosocial behavior (Martela & Ryan, 2016; Weinstein & Ryan, 2010). Furthermore, assigning participants to directly pursue goals related to psychological need satisfaction, the mediator within the EAM, was shown to improve their SWB over a six month period (Sheldon, Cummins et al., 2010).

Maintaining the glow of a life change: The hedonic adaptation prevention model

Of course, people can make changes in their lives that are *not* about adopting and pursuing a new set of goals or plans. For example, one can get married, buy a better car, find a nicer apartment, or move to a sunnier state or country. Lyubomirsky, Sheldon et al. (2005) broadly referred to these as circumstantial variables, which were said to have relatively weak effects on SWB because of hedonic adaptation. The argument was that people almost inevitably become accustomed to their new spouse, car, apartment, or state, because they begin to take it as the invariant status quo, limiting its potential to affect their SWB (Lyubomirsky, 2010; Wilson & Gilbert, 2008).

However, the more recently presented Hedonic Adaptation Prevention (HAP) model (Sheldon & Lyubomirsky, 2012; see Figure 6) assumes that hedonic adaptation is *not* inevitable. The HAP model posits that it is possible to interact with a new life change in such a way that it continues to have an influence on one's SWB. The underlying rationale for the HAP model is the same as for the EAM – namely, that a steady stream of positive experiences is necessary to keep the fire 'fed' such that one's SWB stays in the top part of one's set range. According to the HAP model, this can be achieved via the way one interacts with, and continues to have positive experiences of, the life change.

The HAP model essentially asks, 'How can a person maintain a short-term SWB boost associated with a particular life change, like moving into a nicer apartment, such that the boost still persists?' The model depicts two different routes to such persistence. The first is a bottom-up route, which requires the person to continue to interact with the change (e.g. to experience 'events' involving the

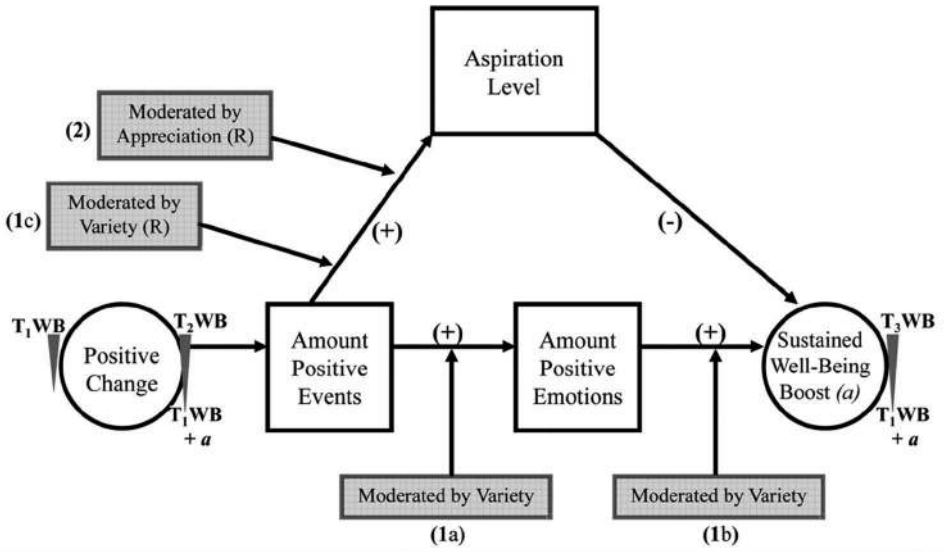

Figure 6. The hedonic adaptation prevention model (Sheldon & Lyubomirsky, 2012).

apartment move), such that the person continues to have momentary positive emotions involving the move, especially surprising and varied ones (e.g. hosting dinner parties in the larger space, strolling the new neighborhood). These momentary emotions cumulate to help sustain the original boost, as in the earlier metaphors of pumping a tire or feeding a fire. The second route is a top-down route, according to which the prevention of hedonic adaptation requires avoiding the temptation to believe that one should have (or deserves to have) even more of (or a better version of) the original change. When a person begins to wish for an even better apartment, job, or spouse, then their ability to derive enjoyment from the current version is diminished. The model specifies that the way to avoid such 'premature rejection' of a favorable life circumstance is to make efforts to appreciate the circumstance, savor it, and feel grateful for it. 'I really love my apartment/job/wife; my life is so enriched by them!'

The HAP model has a lot of knobs and switches, and it was important to carefully test its premises and predictions. Sheldon and Lyubomirsky (2012) conducted an ambitious longitudinal study aimed at accomplishing this. Four hundred and eighty-eight undergraduates completed three questionnaires approximately 6 weeks apart. At Time 1, baseline SWB was measured. At Time 2 SWB was measured again and participants were asked to describe 'the most positive, inspiring, or meaningful change' that had happened to them since Time 1 (such as a new relationship, an unexpected achievement, a new personal resolution, etc.). They were also asked 1) how often they currently think about or are aware of the change; 2) how much positive affect the change makes them feel; 3) how varied and surprising are the experiences resulting from the change; 4) how much the change is currently appreciated; and 5) how much they aspire to more of the change (e.g. 'In the near future, the change will have to get a lot better before I'm satisfied'). Finally, SWB was measured again at Time 3.

We found that the data fit the Figure 6 model very well, including the moderator relationships depicted in the model. That is, the model did a good job of explaining how the positive effects of a particular life change can be maintained over the longer-term – such that a person's happiness both goes up and *stays* up, after an initial positive change in their lives. The HAP model thus illustrates how to 'milk' a life change, to derive the most or the longest-lasting happiness from that change. Of course, under many conditions, it is appropriate to seek more and better of some circumstance in our lives. The HAP model merely shows how to slow down this restless and relentless process, so that one can fully enjoy the life benefits that one has already earned.

How, when, why, and for whom can intentional activities increase well-being? The positive activity model

Because of its suggestion that intentional activities matter in happiness, the Sustainable Happiness Model essentially represented a call for further research – an appeal for future well-being scientists to test the idea that particular positive activities can be effective at boosting well-being. The Positive Activity Model (Layous & Lyubomirsky, 2014; Lyubomirsky & Layous, 2013) may be the SHM's closest and most directly relevant offspring.

The Positive Activity Model (see Figure 7) makes predictions about the conditions under which various positive practices may be more (or less) successful in promoting well-being. To this end, the model identifies specific moderating and mediating factors that underlie the pursuit of happiness. The moderators can be divided into three categories – those relevant to the activity itself (e.g. how frequently the behavior – say, gratitude – is practiced or how varied it is), to the person performing it (e.g. whether the happiness seeker's culture endorses the activity or how much effort she puts in), or to the intersection between the two (i.e. person-activity fit). Hypothesized mediators, such as more frequent positive thoughts, suggest how positive activities 'work' to increase happiness.

The Sustainable Happiness Model suggested that the pursuit of happiness is possible via engagement in positive practices. The Positive Activity Model posits the precise conditions under which such pursuit will be maximally successful. Researchers who conduct randomized controlled trials aimed at testing the well-being-increasing efficacy of positive activities are gathering evidence for these precise conditions. For example, the dosage and target of a positive activity, as well as the motivation and culture of the happiness seeker, appear to be critical. Those who express gratitude too frequently or count too many blessings may not hedonically benefit in terms of happiness (Lyubomirsky, Sheldon et al., 2005; Regan, Shin, Revord, & Lyubomirsky, 2019), and members of interdependent cultures may benefit only when reflecting on kind acts towards in-groups (Shin et al., 2019). Furthermore, as discussed earlier, happiness seekers may obtain maximal benefit from engaging in a positive activity when they are truly motivated to become happier and when they muster effort into their pursuit. For example, in the quasi-experiment described above, those who chose to engage in a practice designed to make them happier (versus a neutral activity) – and who put forth more effort into that practice (as assessed by objective raters) – showed bigger boosts in happiness (Lyubomirsky et al., 2011).

The Positive Activity Model posits an additional factor to consider when designing the optimal happiness intervention and that is how much 'fit' there is between the individual and the activity. In other words, consistent with the French saying, *à chacun son goût* – or 'to each his own taste' – certain activities appear to work better for certain people (Nelson & Lyubomirsky, 2014). For example, highly extraverted happiness seekers may reap more benefits from positive activities that require interacting with others (e.g. Pressman, Kraft, & Cross, 2015), and interventions delivered via mobile phones may be ideal for younger or tech-savvy users.

The Positive Activity Model also identifies potential mechanisms by which particular positive activities will deliver well-being. Specifically, positive practices are hypothesized to produce well-being via increases in positive emotions, positive thoughts, and positive behaviors. Consistent with the EAM, they also do so

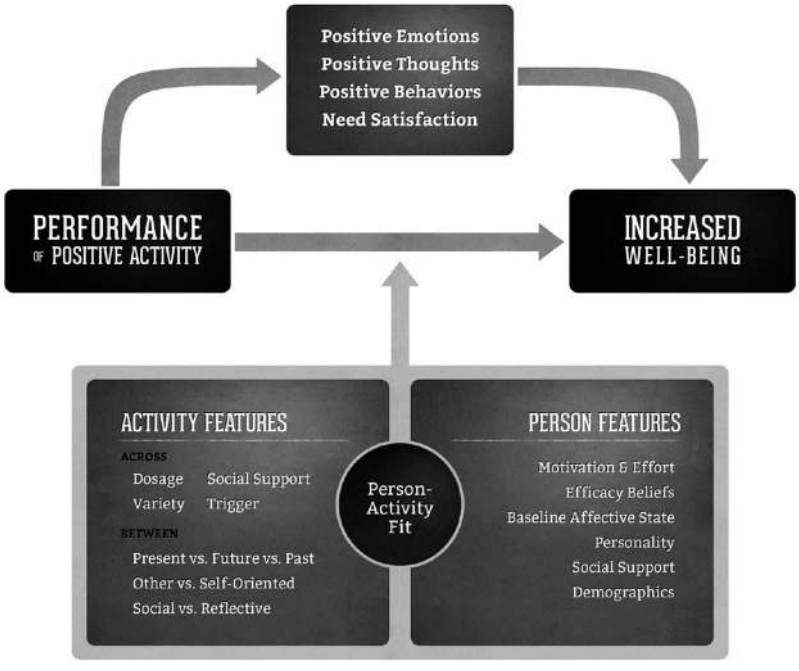

Figure 7. The positive activity model (Lyubomirsky & Layous, 2013).

by satisfying psychological needs (i.e. autonomy, competence, and social connectedness; Deci & Ryan, 2000). For example, gratitude and optimism exercises have been shown to boost happiness by leading people to report more positive perceptions of their life events. That is, those who wrote gratitude letters or visualized optimistic futures became happier in part because they subsequently construed their daily experiences as more satisfying (Dickerhoof, 2007; see also Fredrickson, Cohn, Coffey, Pek, & Finkel, 2008).

Conclusion

We – and the field of well-being science – have come a long way since the Sustainable Happiness Model and pie chart were proposed. Although the pie chart part may have outlived its usefulness, we stand behind the central premise of the SHM, and the supportive research it spawned. Happiness *can* be successfully pursued, but it is not 'easy.' Future investigators and thinkers are likely to generate ever more rigorous studies testing the predictions of the three descendant models we describe here, as well as building even stronger and more exciting theories that will describe and clarify how people can become happier. As growing theory and research is revealing, the pursuit of happiness requires selecting self-appropriate and eudaimonic-type activities (rather than chasing after positive emotions directly); investing sustained (rather than desultory) effort in those activities; and also, practicing them in a varied and changing manner (rather than doing them the same way each time). By such means, people can create for themselves a steady inflow of engaging, satisfying, connecting, and uplifting positive experiences, thereby increasing the likelihood that they remain in the upper range of their happiness potentials.

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