

## The Hedonic Treadmill

This paper reviews the evidence for and against the “Hedonic Treadmill” hypothesis, which states that there is no reliable method for increasing one’s happiness; and in particular evaluates its most common incarnation, “Set Point Theory.” The paper discusses measurement methods, and reviews relevant studies, including twin studies and surveys. The conclusion reached is that set point theory is correct in many ways, in particular in its discounting of parental influence, but that the theory is wrong in asserting that the set point of happiness never changes. It is also concluded that field studies have not and are unlikely to resolve the more general hedonic treadmill hypothesis in either direction, and an experiment is proposed that would.

### Introduction and Background

#### *Adaptation, the Hedonic Treadmill, and Set Point Theory*

An important and incontrovertible phenomenon in the psychological study of happiness is known as *adaptation*: the joy or sadness resulting from a good or bad event tends to fade after a long time. Two early psychologists studying happiness, Brickman and Campbell (1971), posited something stronger: that adaptation is complete and unavoidable. Hence, nothing can have a permanent effect on one’s happiness, and trying to make oneself happier is hopeless. With appropriate pessimism, the authors described this idea as follows: “The nature of [adaptation] condemns men to live on a hedonic treadmill, to seek new levels of stimulation merely to maintain old levels of subjective pleasure, to never achieve any kind of permanent happiness or satisfaction” (Brickman and Campbell, 1971, p289). Since that article, the term “hedonic treadmill” has come to

stand for the hypothesis that trying to improve one's happiness is futile, and that happiness is instead determined entirely by a combination of genes and random effects.

*Set point theory.* A closely related but more specific theory is “Set Point Theory”, which states that one's genes (along with a smaller, random component) determine a lifelong “set point” (i.e. default) of happiness. Happiness can be deflected up or down by events, according to this theory, but the deflections are temporary, and happiness inevitably returns to the set point, typically slight to moderate satisfaction (Diener & Diener, 1995).

Set point theory, and more generally the hedonic treadmill hypothesis, has raised a good deal of controversy, with different psychologists accepting and rejecting different parts of the theory. This paper will review the evidence for and against the different aspects of the theory. But first, as essential background, is a review of the science of measuring happiness.

### *Subjective Well-Being*

*Components of SWB.* Happiness is of course too vague a concept to study; instead researchers study something more specific: How happy people say they are on surveys. This measure is called “Subjective Well-Being” (a.k.a. “SWB”). Unfortunately, the responses depend crucially on the specific survey question asked: In particular, responses to the survey question of how much happiness one feels are only somewhat correlated with responses to the survey question of how little unhappiness one feels (Diener & Emmons, 1984). A fair measure of SWB should take into account both the former (called “positive affect”), and the latter (called “negative affect”). Since it is difficult to

accomplish this with a single survey question, surveys will instead typically measure positive affect and negative affect with different questions. The two can then be combined into one SWB metric, for example by simply subtracting the latter from the former (e.g. Lykken & Tellegen, 1996). In addition to positive and negative affect, there are still other relatively independent components of SWB, in particular one called “Life Satisfaction,” or how satisfied one is with one’s life as a whole (Diener, 2000).

*Usefulness of SWB.* Given the internal complexity of SWB, it might seem unscientific to even regard it as a useful concept, let alone study its causes and consequences. But in fact, measures of SWB have more than enough robustness and predictive power to make SWB a well-defined measure. SWB measurements made with different methodologies are correlated fairly well with each other, with happiness perceived by friends and family, and with susceptibility to suicide (see Diener, 2000, for references). That said, proving that SWB is measurable does not mean that it is the same as ‘happiness.’ Perhaps, indeed, all that SWB measures is one’s inclination to say that one is happy. But happiness is by definition a subjective experience, so if SWB does not measure happiness, it is hard to imagine what would. In sum, SWB is perhaps a noisy and imperfect metric for happiness, but as long as one keeps its limitations in mind, it is an effective and scientific measure.

## The Case for Set Point Theory

### *Twin Studies*

*1988 study.* The most powerful evidence for people having a largely inherited set point for happiness comes from studies of twins and adoptees. These studies attempt to measure the *heritability* of SWB, i.e. the proportion of variability in SWB that can be explained by genetics. One influential study of this type (Tellegen et al., 1988) has four groups of participants: identical twins reared together and apart, and fraternal twins reared together and apart. The twins all took one-time surveys about a number of their personality traits. It was found that 48% of the variance in SWB was explainable by genetics, another 40% came from environmental or random variance that was independent of family environment, and only 13% was family-dependent variance (hardly above the standard error of 9%). Although these results were in agreement with the measurements for all the other personality traits in the study, they are still surprising: The implication is that two siblings are unlikely to become much more similar in SWB growing up in the same family as growing up in different families, and therefore that parenting typically has little or no effect on how happy a child ends up later in life. This 48% heritability estimate, incidentally, understates the importance of genes – according to later data (Lykken & Tellegen, 1996), the stability of SWB measured by this survey was only 67% over just five years, so to the extent that each person's SWB is stable over time, genes account for at least 72% ( $=48/67$ ) of that stable level.

*1996 study.* A similar, later twin study (Lykken & Tellegen, 1996) found even stronger and more reliable data. This study had the advantage of being longitudinal, instead of merely cross-sectional – that is, each participant was surveyed at multiple times. The study found that, among a representative sample of white Minnesota adults, education, socioeconomic status, income, marital status, and religiousness all had statistically significant but small correlations with SWB – religiousness accounted for about 5% of the SWB variance, but the rest of those accounted for 3% or less, with marital status in particular accounting for less than 1%. And as with Tellegen et al. (1988), this study found that the sharing of a home and parents had negligible effect on middle-age personality similarity. Heritability of SWB was computed as follows: The correlation between each subject's first and last response (10 years apart) was 50%, and the correlation between one identical twin's early response and his sibling's later response was 40%. This indicates that a full 80% ( $=40/50$ ) of the stable component of SWB is genetically determined – although the interactions between the genes and environment are so interrelated and complex (i.e., non-additive) that fraternal twins (who only share half their genes) showed virtually no analogous correlations.

*Other Studies:*

These studies both give evidence that, insofar as SWB is a stable trait over time, it is largely genetically determined, with the rest being a random family-independent effect; and many other twin studies have largely confirmed these results (Goldsmith, 1983, p334). This, however, is only one component of set point theory; it is also necessary to show that SWB is predominantly stable over time, and in particular that positive or

negative life events do not have a lasting effect on it. Evidence for this comes from several sources. One source is cross-sectional studies. As noted above, many parameters that might be expected to have a large effect on happiness (income, education, marital status, etc.) in fact seem to explain little to none of the variation in SWB (Lykken & Tellegen, 1996). Other cross-sectional studies on income and marriage show a larger correlation with SWB – 10-20% for income within the US (Diener & Biswas-Diener, 2002) and 2% for marriage (Haring-Hidore et al., 1985) – but the effect is still relatively minor. Still other cross-sectional studies attempt to witness adaptation more directly. Brickman et al. (1978) found that former lottery winners were not significantly happier than a control group, while victims of crippling accidents were only somewhat less happy (averaging 2.96 on a scale from 0, “not at all” happy, to 6, “very” happy). These results have since been refined with longitudinal studies. Silver (cited in Lucas et al., 2003), for example, found that people suffering spinal injuries were immediately very unhappy, but that their happiness steadily rose over eight weeks to a level above “neutral happiness” on the scale. This can be seen as direct evidence of adaptation, although the study did not address whether the adaptation was complete with respect to pre-injury happiness levels.

### The Case Against Set Point Theory

The above studies, though compelling, are not uncontroversial, and the literature has seen many rebuttals of various parts of set point theory. The rebuttals can be grouped into three classes: those arguing that the stable component of SWB is not as heritable and random as claimed; those arguing that the stable component of SWB is not as important

as the non-stable component; and those arguing that, even if SWB is stable and heritable, it is not genetically predetermined, and can be altered by behavior.

*Is the Stable Component of SWB Heritable and Random?*

One school of thought attacking set point theory addresses the methodology of twin studies. In particular, many developmental psychologists question the assertion that family environment has no systematic effect on SWB. One often-cited paper along these lines is by Hoffman (1991). He offers several related reasons for not discounting a family-dependent effect. One such reason goes as follows: The quantitative comparison between identical and fraternal twins assumes that the different kinds of twins experience equally similar environments, but this assumption is wrong, as identical twins are treated more alike due to their similar appearance. As proof, Hoffman cites several studies that show that parental treatment of children depends on looks, as well as two studies that found that similar-looking fraternal twins have personalities almost as similar as identical twins. This argument, however, misunderstands the idea of heritability – just because the effect of a gene on a trait is very indirect (e.g. genes affect appearance affects treatment affects personality), that does not make it any less heritable, and set point theory makes no claims about the mechanism through which the set point is inherited.

Another argument that Hoffman offers against the twin studies is that because the “shared” family environment is in fact different for different children, the parental effect is not apparent from just looking at correlations. He cites many studies to this effect, showing, for example, that oldest children are likely both to receive more parental attention and to have higher long-term achievement and anxiety, that a divorce is

experienced differently by children of different ages, that parents treat boys and girls differently, and that idiosyncratic experiences, such as a serious childhood disease, can have at least short-term effects on both parental treatment and personality. All these studies back up the theory that parents heavily influence personality, but only insofar as they show the theory is not disproved by sibling differences. Equally important is Hoffman's complete lack of positive proof of his theory – i.e. showing that parental treatment causes personality, rather than merely being sometimes correlated with it. Instead, the explanations in the paper seem to rely on such diverse and subtle details of parental treatment that his explanations start to seem not only unproven, but arbitrary and devoid of predictive value.

So while it would be an exaggeration to say that the shared family environment has *no* effect on long-term SWB (even the twin studies cited above found a positive, albeit nonsignificant effect; see also Goldsmith, 1983, p336), it still seems likely that any such effect is dwarfed by genetics, and by family-independent variation –interactions with peers, random variations in development, idiosyncratic life events, and so on. Indeed, it seems reasonable to conclude that, as set point theory predicts, the stable component of SWB is largely heritable and mostly independent of parenting. But questions remain about the unstable component; this will be discussed next.

### *Is SWB Stable?*

A second area of set point theory that has been debated is the notion that SWB is by and large fixed, with life events causing only temporary deflections one way or the other. Many studies have instead found only moderate stability of SWB. A longitudinal



study of Australian adults (Headey & Wearing, 1989), for example, found only around 60% stability for the three main components of SWB over six years, even after accounting for the short-term noisiness of the data. A 17-year study of Germans (Fujita & Diener, 2005) found a similar value of about 50% stability for life-satisfaction. Twenty-four percent of the participants had a significant change in life satisfaction over the course of the study (according to a *t*-test with  $\alpha=.05$ ), about five times as many as would be expected if baselines were stable. A third longitudinal study (Lucas et al., 2003) found that, though marriage has little effect on SWB when examined as a cross-sectional average (1%, in agreement with the review by Haring-Hidore et al., 1985), marital status accounted for a full 8% of within-subject SWB, viewed longitudinally. Moreover, a high proportion of participants saw long-lasting systematic change following marriage (albeit usually moderated by adaptation), but since some became significantly happier and others significantly less happy, the average obscured this information. In fact, they found that the long-term reaction to marriage could be predicted with 80% reliability from the initial reaction – those who became much happier immediately following marriage remained somewhat happier years later, while those who became immediately less happy likewise stayed somewhat less happy in the long term. And finally, following widowhood, partial adaptation was common but not ubiquitous, and total adaptation was rare, even eight years after the event.

These studies leave little doubt that long-term changes in SWB are possible, indeed not unusual. While this effectively disproves the strongest version of set point theory, the more general hedonic treadmill hypothesis may still be true, assuming that the

SWB changes can only be precipitated by events beyond one's control. This distinction will be discussed in more detail shortly.

*Does Heritability of SWB Mean Genetic Determinism?*

A final argument against set point theory, indeed against the whole hedonic treadmill hypothesis, starts out by conceding that SWB may be largely heritable, but asserting that happiness can nevertheless be achieved by anyone. There is nothing *a priori* contradictory about this position – one might imagine, for example, that there is a happiness pill that has not yet been discovered.

Indeed, a number of seemingly controllable life factors have been shown to predict high SWB. As mentioned above, married people have reliably (though modestly) higher SWB on average, and only part of that is attributable to the fact that previously-happy people are more likely to get married (Lucas et al., 2003). Likewise, people with good social relationships tend to be significantly happier, and again only part of the difference is explained by the fact that having good social relationships is correlated with having certain personality traits (e.g. extraversion, Hotard et al., 1989). Similar results have been found for having religious belief (Ellison, 1991) and for setting reasonable goals and caring about their completion (Emmons, 1986). In the case of money, higher income is moderately correlated with higher SWB among the world's poor (for whom higher income is necessary to fulfill basic homeostatic needs), and the effect is smaller but still statistically significant among the well-off. Here, too, there is evidence that happiness causes higher income to some extent, but at least part of the observed

correlation is most likely due to higher income causing higher SWB (Diener & Biswas-Diener, 2002).

These studies all suggest that, at least in part, lifestyle causes happiness rather than the other way around, but they leave open the possibility of a third variable causing both. In the case of marriage, for example, one might imagine that, say, a natural propensity to have low long-term expectations makes one especially likely to get married (thanks to low standards), and simultaneously likely to become independently happy in middle age (having reached one's general life expectations). And even if the direction of causality is that lifestyle causes happiness, as the above studies try to show, then genetic determinism is still not disproven. Perhaps no amount of coaching, willpower, or practice can make an irreligious person into a religious believer, an overly-ambitious person into one with realistic goals, or an introvert into a socialite or spouse. Indeed, given the problematic nature of the distinction between aspects of yourself that you can "control" and aspects that you can't, it seems unlikely that any field study could definitively decide the question.

*Experimental evidence.* Experiments, on the other hand, would be quite capable of deciding the hedonic treadmill hypothesis. No experiments known to this author have directly tested whether an average person can be made reliably happier in the long term by some intervention, but there have been studies done along these lines for a particular segment of the population: those suffering from depression. Placebo-controlled studies have shown that antidepressant medications are effective at curing depression (Thase & Kupfer, 1996), and there are also indications that cognitive therapy, a type of psychotherapy in which the therapist attempts to teach the patient how to notice and

control excessively negative thoughts and beliefs, can both reduce depression and lower relapse rates after treatment (DeRubies et al., 2005). Although people not suffering from depression would presumably be ill-advised to take antidepressant drugs, it is certainly plausible from the latter study that people even of average happiness could increase their happiness still further in the long term by undergoing cognitive therapy.

*Possible experiment.* One long-term experiment that might definitively decide the truth of the hedonic treadmill would be a modification of the depression experiment mentioned above. People of different ages and SWBs would be randomly assigned to a “happiness class” which teaches ideas from cognitive therapy, along with perhaps social skills, religion, relationship advice, and other such things proven to be associated with high SWB. Over the next ten to twenty years, SWB would be measured to see if there were any systematic changes between those that took the class and a control group. If there were, then the happiness treadmill would be definitively disproved. If not, then either the hedonic treadmill hypothesis is true, and happiness is a combination of genetics and randomness; or else the class was poorly taught. Further experiments would have to be done to distinguish these two possibilities.

## Conclusion

To sum up, an examination of the evidence shows that set point theory is only partially true: The stable component of SWB seems to be family-independent and highly heritable, but life changes can have permanent effects on SWB. On the other hand, the hedonic treadmill hypothesis, i.e. that there is no way to reliably improve one’s happiness,

has been neither proven nor disproven, but the study proposed above could in principle decide. That study, with its long-term experimental design, would be rather difficult and expensive; but given the complexity of personality, it seems doubtful that any field study could definitively prove cause and effect.

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