



Deconstructing the hedonic treadmill: Is happiness autoregressive?

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ABSTRACT

Affective habituation is well-documented in social sciences: people seem to adapt to many life events, ranging from lottery windfalls to terminal illnesses. A group of studies have tried to measure habituation by seeing how lagged values of life events affect present happiness. We propose an additional adaptation channel: current happiness may depend directly on past happiness, which amounts to assessing whether happiness is autoregressive. We run dynamic happiness regressions using individual-level panel data from the German Socio-Economic Panel Study, the Japanese Panel Survey of Consumers, the British Household Panel Survey and the Swiss Household Panel. As in previous studies, the coefficients on lagged events (e.g., becoming unemployed, getting married) suggest strong habituation. However, all the econometric models suggest that the coefficient on lagged happiness is positive and significant. We discuss whether this may be evidence of happiness having an inertial force (besides the usual habituation channel).

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1. Introduction

Brickman and Campbell (1971) coined the term “hedonic treadmill” to describe how people tend to adapt to good and bad events and then return to the same baseline level of happiness. Since then a number of papers in the fields of psychology and economics have shown some evidence that people adapt to particular life events, ranging from lottery windfalls (Brickman et al., 1978) to losing a limb to cancer (Tyc, 1992). A group of papers have used survey data to measure habituation through the lagged effects of life events: e.g., Lucas et al., 2003; Diener et al., 2006; Di Tella et al., 2007; Clark et al., 2008. We propose an additional channel for adaptation: current happiness may depend directly on past happiness, which amounts to assessing whether happiness is autoregressive.

We call this the “general habituation” channel: i.e. having experienced moments of happiness (unhappiness) in the present will directly make people prone to feelings of unhappiness (happiness) in the future, regardless of whether the original increase (decrease) in happiness was due to changes in income, health or love partners. As a matter of fact, in the psychology literature there are similar distinctions between the different adaptation channels: e.g., Kahneman (2000) distinguishes between the “hedonic treadmill” and the “satisfaction treadmill.”¹

To the best of our knowledge, we are the first to run dynamic happiness regressions with individual-level data. We exploit data from the German Socio-Economic Panel Study, the Japanese Panel Survey of Consumers, the British Household Panel Survey and the Swiss Household Panel. We propose a variety of econometric models to overcome many identification challenges. In accordance with the existing results in the literature, we find that happiness increases one year after negative events like becoming unemployed or widowed, and it decreases one year after positive events like getting married or having children. However, the coefficient on lagged happiness is positive and statistically relevant. We discuss whether, instead of habituation, this may imply that past feelings of happiness have an inertial effect on contemporary happiness (besides the usual habituation channel).

Section 2 briefly summarizes the literature on hedonic adaptation and discusses the difference between the general- and specific-habituation channels. Section 3 presents the econometric results. The final section concludes.

2. Hedonic adaptation

2.1. Literature review

There are a numerous studies in the social sciences presenting evidence that people experience hedonic adaptation to specific life events, which we denote the *specific* habituation channel. For instance, Brickman et al. (1978) show that state lottery winners reported only slightly higher levels of life satisfaction than a con-

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¹ In a similar spirit, Frederick and Loewenstein (1999) introduce the concept “specific-domain hedonic adaptation.”

trol group. Oswald and Powdthavee (2008) provide longitudinal evidence that people who become disabled exhibit a 30–50% recovery in mental well-being. Tyc (1992) found no difference in quality of life between young patients who had lost limbs to cancer compared with those who had not. In a study of prisoners, Wormith (1984) observed significant improvement in deviance, attitude, and personality measures. Among the health studies, hedonic adaptation has been studied with burn victims (Patterson et al., 1993) and hemodialysis patients (Riis et al., 2005).

Many economists seem to be familiar with the hedonic adaptation hypothesis: in the 2007 policy-views survey of a random sample of members of the American Economic Association, less than half of the respondents agreed that economic growth in developed countries like the U.S. leads to greater levels of happiness (Whaples, 2009). Indeed, some economists have been working on the measurement of hedonic adaptation. For example, Di Tella et al. (2007) used panel data on life satisfaction and concluded that 65% of the initial effect of an increase in income is lost over the ensuing four years. Clark et al. (2008) use panel data to find evidence of adaptation to life events such as unemployment, layoffs, marriage, and divorce. For more details about empirical and experimental evidence see Frederick and Loewenstein (1999).

Most of these studies rely on subjective well-being scores to measure hedonic adaptation. Subjective well-being measures have been shown to correlate with objective measures of well-being, like smiling frequency (Ekman et al., 1990) and clinical ratings (Pavot et al., 1991). In particular, Perez Truglia (2010) shows that life satisfaction and happiness scores are quantitatively consistent with revealed-preference measures of consumption utility.² But even if happiness scores were consistent at a single point in time, it is still possible that they are inconsistent over time (see for example Hagerty, 2003). If that were the case, then the evidence on hedonic adaptation could be invalidated to a large extent (Stevens, 1958).

There have been occasional attempts to avoid the problems created by “scale-norming” in affective habituation studies. For instance, in a study of chronic dialysis patients Baron et al. (2003) found that making the scales more precise only reinforces the estimates of adaptation. Moreover, Kahneman and Krueger (2006) argue that other measures of current happiness (e.g., from the day reconstruction method) show even stronger hedonic adaptation than happiness scores (for more details see Frederick and Loewenstein, 1999). However, Smith et al. (2006) argues that the jury is still out. They elicited current levels of happiness from people with colostomies and those whose colostomies had been reversed, where the latter are expected to become less happy. Both groups reported identical happiness. However, they also asked each group how happy they had been in the past. Those with colostomies recalled being significantly happier than they currently were. On the other hand, those with reversed colostomies recalled being significantly less happy. Also, neither group believed that people with colostomies were about as happy as people whose colostomies had been reversed. For more details see Loewenstein et al. (2008), which discusses similar results for dialysis patients and happiness across age groups.

2.2. General habituation

Rayo and Becker (2007) and Perez Truglia (2009) looked at what we might recognize as the evolutionary origins of hedonic adaptation. The basic intuition is that positive and negative hedonic states are costly from a fitness perspective: e.g., generating feelings is a

waste of energy for the brain. In order to minimize those fitness costs, humans have adapted with hedonic states that quickly return to “normal levels.” The reward centers of the brain can thus be viewed as homeostatic systems that trigger adaptation whenever upper and lower thresholds are achieved.

There are many different ways in which those homeostatic systems in the brain can work. Indeed, even though there is some agreement about the empirical relevance of hedonic adaptation, there is no consensus on the actual mechanisms that make such adaptation happen (Kahneman, 2000). For instance, rewarding feelings may be a function of deviations from expectations. If individuals are rational, then the average individual will get exactly what he expects and therefore will have “normal” levels of rewarding feelings. Also, individuals may form habits, such as individuals in a “steady state” have “normal” levels of rewarding feelings. Finally, the reward centers in the brain may work as a spring: i.e., as soon as an individual excites some area in the brain, the corresponding reward system will automatically start pushing in the opposite direction with a force that is proportional to the deviation from the “normal” rewards.

In order to illustrate the above theories more clearly, let R_t denote rewarding feelings at time t (e.g. happiness), let S_t denote positive stimulus and let $S_{t-1,t}^e$ denote expected stimulus at t from the perspective of $t-1$. Current rewarding feelings can be represented by the following function:

$$R_t = f(R_{t-1}, S_{t-1}, S_{t-1,t}^e)$$

The habit-formation hypothesis says that R_t is decreasing in S_{t-1} : i.e., people habituate to past consumption so, ceteris paribus, greater past consumption will decrease current rewarding feelings. The aspiration hypothesis says that $S_{t-1,t}^e$ is decreasing in R_t : i.e., ceteris paribus, having had higher expectations about present stimulus decreases the level of rewarding feelings. Those hypotheses are very difficult to distinguish from one another because people are not completely irrational and S_{t-1} and $S_{t-1,t}^e$ therefore closely follow each other. Finally, R_t may depend directly on R_{t-1} . If the relationship is negative, we call this the “general habituation” channel: i.e., just like in the example of the spring, having experienced moments of happiness yesterday induces a force in the opposite direction on current happiness.

The effect of R_{t-1} on R_t is very difficult to disentangle from the effects of S_{t-1} and $S_{t-1,t}^e$, since they are all closely related to each other by construction. That is not the goal of this paper. Even though the differences between specific habituation and general habituation may be subtle from a theoretical point of view, they are relatively clear from an econometrician’s perspective: i.e., while the effect of specific habituation to income will be captured by the coefficients on lagged income, the effect of general habituation will be captured by the coefficient on lagged happiness. As a consequence, the effect on happiness from an increase in income will be twofold. On the one hand, higher income increases future income aspirations and, ceteris paribus, decreases future happiness (specific habituation). On the other hand, higher income increases present happiness and then makes the individual more prone to feelings of unhappiness tomorrow (general habituation).

Finally, there is at least one important advantage of measuring adaptation through the direct effect of past happiness. Consider a more realistic setup where the function matching rewards and stimuli is stochastic and heterogeneous across individuals. The hedonic adaptation hypothesis would predict that hedonic states bounce back only for those individuals who were effectively rewarded by the stimuli to begin with. As a consequence, the effect of past happiness on current happiness is supposed to pick up a more direct prediction of the hedonic adaptation hypothesis.

² For a discussion of the general problems behind self-report data see Bertrand and Mullainathan (2001) and Schwarz (1999).

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