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**Working Paper**

## Happiness in the Lab: What Can Be Learned about Subjective Well-Being from Experiments?

GLO Discussion Paper, No. 943

**Provided in Cooperation with:**

Global Labor Organization (GLO)

*Suggested Citation:* Ifcher, John; Zarghamee, Homa; Goff, Sandra H. (2021) : Happiness in the Lab: What Can Be Learned about Subjective Well-Being from Experiments?, GLO Discussion Paper, No. 943, Global Labor Organization (GLO), Essen

This Version is available at:

<https://hdl.handle.net/10419/242823>

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# Happiness in the Lab: What Can Be Learned about Subjective Well-Being from Experiments?

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## Abstract

The recent surge in analyses of subjective well-being (SWB) and the economics of happiness using large observational datasets has generated stylized facts about the relationship between SWB and various correlates. Because such studies are mostly concerned with the determinants of SWB, the modeling utilized assumes SWB to be the dependent variable. Often, selection effects, reverse causality, and omitted variable bias cannot adequately be controlled for, calling many of the stylized facts into question. This chapter explores the important contributions that happiness-in-the-lab experiments can make to the debates about stylized facts by testing the causality of the relationship between SWB and its correlates. A distinction is made between happiness-in-the-lab experiments in which SWB is a dependent versus independent variable, and methods for both types of experiments are discussed, along with a discussion of the limitations inherent in such experiments. The extant happiness-in-the-lab literature is reviewed and future directions for happiness-in-the-lab research are proposed. The important role that happiness-in-the-lab experiments can play in the development of national SWB accounting is emphasized.

**Keywords:** Subjective Well-Being, Happiness, Positive Affect, Randomized Controlled Trials (RCT), Economic Experiments, & Causation.

**JEL Codes:** C9, I31

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## I. Introduction

Recent years have witnessed a surge in the use of subjective well-being (SWB), or more informally, happiness, data: an increasing number of governments collect SWB data from their citizens for policy purposes at both the national (e.g., Bhutan, Britain, Thailand, and UAE) and local (e.g., Somerville, MA, USA and Bristol, UK) levels, and the United Nations Sustainable Development Solutions Network publishes a World Happiness Report annually. For one, this proliferation is due to the systematic validation of SWB measures' reliability, particularly for research comparing group means. Research has shown that individuals with high SWB are judged to be happier by others, are less likely to need psychological counseling or miss work, and are more energetic, flexible, creative, and optimistic about the future. Equally important has been the overwhelming evidence of Gross Domestic Product's (GDP) limitations as a unique measure of an economy's health and the resulting demand for complementary measures (see Stiglitz, Sen, and Fitoussi 2010).

The majority of SWB research conducted by economists relies on large, observational datasets, such as the World Value Survey, that include SWB data. Researchers use this data to understand how SWB is affected by economic policies and phenomena, including: GDP, real GDP per capita, inflation and unemployment, business cycle volatility, income taxes, income support programs for low-income households, unemployment benefits, social safety nets, income relative to others' (relative income), and income inequality. From this literature emerged the controversial "Easterlin Paradox"—that despite a strong positive cross-sectional correlation between happiness and real GDP per capita, average national happiness is uncorrelated with economic growth over time (Easterlin 1974; see "Easterlin Paradox" in this handbook).

Other stylized facts have also emerged from studies that consider demographic correlates of SWB: married individuals are more happy than non-married individuals on average; non-parents are more happy than parents on average (Herbst and Ifcher, 2016; see "The Economics of Happiness" in this handbook); religious individuals are more happy than non-religious individuals on average; individuals in western countries with less income inequality are more happy than individuals in western countries with more income inequality on average; and individuals' happiness is decreasing in relative income (see "Wage Satisfaction and Reference Wages" in this handbook).

Some of these stylized facts are based on correlations, as causal identification strategies are often unavailable when studying happiness. Consider, for example, that married individuals are happier than unmarried individuals on average. Attributing causality to marriage might suggest that policies promoting marriage would increase happiness. But causation may run in the opposite direction, such that happier individuals are more likely to get married. Or there may be an

omitted variable, such as religiosity, that causes both greater happiness and higher marriage rates. Then a marriage-promotion policy would not necessarily increase happiness and could diminish it, if, for example, the policy results in poorly matched individuals getting married. The same can be said for the correlations between happiness and many economic behaviors (see Lane 2017). More generally, this example illustrates the importance of identifying causal happiness relationships whenever possible.

One way to measure the effect of happiness on various outcomes is to use instrumental-variable techniques. For example, the mood-effects of unexpected weather have been shown to influence risk aversion (Güven and Hoxha, 2014), while the mood-effects of unexpected sports outcomes have been shown to influence health, crime, suicide rates, stock returns, political views, self-confidence, and optimism (see Edmans, García, and Norli 2007).

The gold standard for identifying causal relationships is the randomized controlled trial (RCT). In an RCT, participants are randomly assigned to either the treatment or control group. As a result, the underlying characteristics of participants in the treatment and control groups should be the same, on average, and the only difference between the two groups should be the “treatment” administered to the treatment group and the “placebo-treatment” administered to the control group. Assuming a well-designed experiment, a sample of adequate size, and a valid randomization procedure, significant differences that emerge between the treatment and control groups are presumably caused by the treatment.

Given the number of happiness studies that are correlational in nature, and given the need for more happiness studies to identify causal relationships, the use of lab experiments can help address these shortcomings. This chapter explores both the possibilities of studying happiness in the lab and limitations inherent therein. To date, there have been a modest number of happiness-in-the-lab experiments conducted by economists with the intent of identifying causal relationships between SWB and variables of interest to economists.

Before continuing, it is important to note two points. First, happiness-in-the-lab experiments, and economics-of-happiness studies in general, can largely be divided into two distinct groups: those in which happiness is the independent variable, and those in which happiness is the dependent variable. Second, many, but not all, happiness-in-the-lab experiments are RCTs. That is, some happiness-in-the-lab studies do not randomly assign participants to a treatment or control group; non-RCT happiness-in-the-lab studies are more common in experiments with happiness as the dependent variable and when self-reports of happiness are being compared to choices (Diaz et al. 2021; Benjamin, Heffetz, Kimball, and Rees-Jones 2014).

In experiments with happiness as the independent variable, researchers seek to understand the impact of being happy on economic policies and phenomena, including preferences, beliefs, and

decision-making. In such studies, experimenters attempt to increase the happiness of participants in the treatment group, and then, examine the impact of the treatment on an outcome of interest to economists. For example, Oswald, Proto, and Sgroi (2015) examine whether being happy increases productivity. The authors randomly assigned subjects to either a positive-affect (treatment group) or neutral-affect (control group) mood-inducement procedure, with participants watching video clips to induce the intended affect; this method is well established in the psychology literature (see “Measuring Subjective Well-being” in this handbook). After the mood-inducement procedure, participants’ productivity was measured using an incentivized, real-effort task. The authors find that participants in the treatment group are more productive than those in the control group.

In experiments with happiness as the dependent variable, researchers seek to understand the impact of economic variables on happiness. For example, using a lab experiment, Ifcher et al. (2020) test the “relative income effect” (RIE) – that, *ceteris paribus*, happiness is decreasing in others’ income. Participants’ happiness was measured before and after an exogenous relative-income shock. While receiving a negative relative-income shock (learning one’s payment is less than another subject’s) is happiness-diminishing, receiving a positive relative-income shock (learning one’s payment is greater than another subject’s) is not happiness-increasing. This latter finding violates the RIE, as the RIE suggests that a positive relative-income shock should be happiness-increasing, and contrasts with the stylized fact that has emerged from observational studies that happiness is decreasing in others’ income.

An important implication of the RIE is that economic growth may not be as welfare-improving as it may seem. Indeed, the RIE has been offered as a potential explanation for the Easterlin Paradox. Despite this importance, identification of the RIE using observational data is in almost all cases confounded by selection (e.g., into neighborhoods or occupations) and omitted variable bias emerging from inadequate controls for cost-of-living and access to public goods, calling the stylized facts of the RIE into question. Such concerns can be resolved in observational studies contingent on the existence of sufficient data for controls. Lab experiments offer an alternative strategy for identifying the RIE by exogenously manipulating relative income in a context free of real-world confounds.

This chapter is intended to illustrate the important role that happiness-in-the-lab experiments can play in answering happiness-research questions, discuss the limitations inherent in happiness-in-the-lab experiments, provide a primer for economists on how to conduct happiness-in-the-lab experiments, and review the extant happiness-in-the-lab literature. The rest of the chapter unfolds as follows. First, a brief overview of SWB-observational studies is provided. Second, the happiness-in-the-lab literature in which happiness is used as an independent variable is discussed. Third, the happiness-in-the-lab literature in which happiness

is used as a dependent variable is discussed. Fourth, a strand of literature is presented that shows how happiness-in-the-lab studies can help realize the potential of SWB measures as tools for economic analysis and public policy. The chapter concludes with a brief consideration of future directions for happiness-in-the-lab research.

## II. Background: SWB in Observational Studies

### *A. SWB Measures*

In observational studies, SWB is typically measured by asking respondents to report their well-being in response to a prompt, for example:

- (Item i) “Taken all together, how would you say things are these days – would you say that you are very happy, pretty happy, or not too happy?” (from the General Social Survey; (Smith et al. 2018)).
- (Item ii) “Please imagine a ladder with steps numbered from zero at the bottom to 10 at the top. The top of the ladder represents the best possible life for you and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally feel you stand at this time?” (“Cantril's Ladder” from the Gallup Daily Poll; (Cantril 1965; Gallup 2009))
- (Item iii) Agreement with the statement “Did you feel worried for a lot of the day yesterday?” (from the Gallup-Sharecare Well-Being Index; (Gallup 2011))
- (Item iv) Agreement with the statement “Did you feel happy for a lot of the day yesterday?” (from the Gallup-Sharecare Well-Being Index; (Gallup 2011))
- (Item v) Agreement with “I lead a purposeful and meaningful life.” (Diener et al. 2010)

Such SWB measures are included in a series of large, general-purpose, cross-sectional surveys, such as Eurobarometer, Gallup World Poll, U.S. General Social Survey, and World Value Survey. Many of these datasets are publicly available; though, some, like the Gallup World Poll, are proprietary and not publicly available. In addition, there are a handful of longitudinal surveys that contain SWB measures; these include the British Household Panel Survey and German Socio-Economic Panel. SWB data from these surveys as well as a few other surveys are heavily used in the economics-of-happiness literature.

SWB researchers have identified three broad components of SWB and the importance of measuring them separately for policy purposes. These are:

- Evaluative-SWB: overall satisfaction/happiness with life, or satisfaction/happiness with specific domains of life (e.g., financial or marital satisfaction).
- Experiential-SWB: feelings or emotions experienced over narrower time periods (e.g., the present moment or the last week).
- Eudemonic-SWB: having meaning and purpose in life and fulfillment of basic psychological needs (e.g., feeling respected, autonomous, or self-accepting).

The five SWB items above span these three components. Items i and ii measure evaluative SWB, Items iii and iv measure experiential SWB, and Item v measures eudemonic SWB.

For some potential correlates of SWB, the three broad components of SWB components are sometimes similarly responsive, but for others they are not. For example, while all three components are positively correlated with income in the cross-section, the correlation has been shown to extend to incomes above \$75,000 for evaluative but not experiential SWB (Kahneman and Deaton, 2010). More dramatically, the sign of the correlation can change depending on the SWB measure, as in the case of having children, which has been found to negatively correlate to experiential SWB but positively correlate to evaluative SWB. It should be noted that observational studies sometimes use textual analysis to proxy for SWB. For example, Dodds et al. (2011) assess affect using Twitter posts, and Hills, Proto, Sgroi and Seresinhe (2019) conduct similar affective analyses of books and newspapers.

### *B. Econometric Considerations and Identification Strategies*

Observational studies are typically concerned with determinants of SWB and are modeled using a standard SWB equation, regressing a measure of SWB on a variable of interest and additional covariates. For individual  $i = 1, \dots, I$ :

$$y_i = \beta X_i + \alpha Z_i + \varepsilon_i \quad (1)$$

where  $y_i$  is individual  $i$ 's SWB;  $X_i$  the variable of interest;  $Z_i$  a vector of potential SWB-correlates that often includes demographic and socioeconomic characteristics; and  $\varepsilon_i$  the net effect of unobserved characteristics and measurement error. The coefficient of interest is  $\beta$ , which measures SWB's correlation with the variable of interest holding constant the vector of covariates.

To study parental happiness, for example, economists often regress SWB on parental status, and a series of known SWB-correlates, like gender, income, and marital status. As SWB data is ordinal, or even binary, researchers should use (ordered) logit or probit regressions. But because the resulting estimates are often comparable to those obtained from ordinary least squares (OLS)



while being more challenging to interpret, it is often the case that SWB researchers only report OLS specifications.

Happiness economists who use observational data have attempted to use various strategies to develop evidence of causal relationships. For example, in studying parental happiness, economists have used longitudinal analyses to demonstrate causation, examining respondents' happiness before and after they became parents, controlling for individual fixed effects (Myrskylä and Margolis 2014). Happiness economists using observational datasets also exploit quasi-experiments when possible. For example, Boyd-Swan et al. (2016) use difference-in-difference analysis to measure the intent-to-treat effects of an Earned Income Tax Credit expansion on SWB, and Kuhn et al. (2011) measure the effects of absolute and relative income shocks by analyzing the happiness of Dutch lottery winners and their neighbors.

Yet, many SWB studies remain correlational in nature, warranting additional tools to identify causal relationships. One such tool that has been used to a limited extent is happiness-in-the-lab studies. Next, the discussion turns to the translation of SWB research to a lab setting, including the limits and challenges of conducting happiness-in-the-lab experiments.

### III. Translating SWB to a Lab Setting

Before commencing a happiness-in-the-lab experiment, the researcher should consider the limits of using some SWB measurements in the lab environment. If an experimenter would like to determine whether increasing evaluative or eudemonic SWB increases productivity, a laboratory approach is likely inappropriate given the limited duration and scope of lab experiments. Further, it is presumably unethical to manipulate a participant's actual evaluative or eudemonic SWB, which leaves experiential SWB as the only measure amenable to the lab.

Additionally, experimenters have to be sensitive to context, framing, and question-order effects, all of which have been shown to affect self-reported SWB (Krueger and Schkade 2008; Lee et al. 2016; Weinberg, Seton, and Cameron 2018). Large observational datasets that include SWB questions are specifically designed to minimize the scope of such effects. Insufficient design considerations might temporarily – and spuriously – elevate or depress SWB measured in the lab, leading the experimenter to draw false conclusions from the data.

#### *A. Happiness versus Positive Affect*

The distinction between general happiness (a measure of evaluative SWB) and positive affect (a measure of experiential SWB defined as “the extent to which an individual subjectively experiences positive moods such as joy, interest, and alertness (Miller 2011)”) – and what this

distinction means for studying the impact of happiness – has been considered by Lyubomirsky, King, and Diener (2005) and Konow and Earley (2008). In the former, the authors discuss four possible strategies for identifying the impact of happiness. Due to the inherent difficulty of demonstrating causation, the authors consider the least valid strategy to be the correlational study; and the ideal strategy to be an experiment in which underlying evaluative SWB is manipulated. Recognizing that the ideal experiment for identifying the effect of happiness is, as discussed above, not feasible, the authors encourage the use of experiments that induce positive affect as a treatment. The validity of this approach relies on the empirical observation that happier individuals experience more frequent positive affect, or, as Diener, Sandvik, and Pavot (1991) put it, that “frequent positive affect is both necessary and sufficient to produce the state we call happiness.” Thus, the results of happiness-in-the-lab experiments that use positive affect as the independent variable are at least suggestive of the impact of increasing underlying happiness. One could then argue that an experimental task or information revelation that increases participants’ positive affect would potentially increase participants’ happiness if the task or revelation were commonly experienced. It should be noted that the term positive affect is often itself referred to as happiness in the literature, blurring the distinction between the evaluative and experiential measures; researchers should use clear language to avoid conflation of the two.

### *B. The Potential Scope of Happiness-in-the-Lab Experiments*

Irrespective of how positive affect and happiness are related, happiness-in-the-lab experiments that study positive affect have important implications. Affective shocks are an ineluctable fact of life. An unusually easy commute to work one day or a small word of encouragement from a colleague are often enough to induce a pleasant mood. Such moods have been found to last from ten to twenty minutes from experimental inducements (Isen, Clark, and Schwartz 1976; Isen and Gorgoglione 1983), but introspection may reveal even longer-lasting effects—hours or even days. That said, the mildness and short-livedness of the affective shocks in happiness-in the-lab experiments speaks to and not against the potency of mood’s effect on behavior.

The significant impact of seemingly trivial changes in mood echo similar results in other domains. For example, default 401(k) options have been shown to dramatically increase both participation and savings rates (Madrian and Shea 2001), while default organ-donation options dramatically affect take-up (Johnson and Goldstein 2003). These results suggest the scope for policymakers to incorporate mood into choice architecture. For example, taking the lead from the Ifcher & Zarghamee (2011) and Pyone & Isen (2011) result that induced positive affect increases patience in decisions over money, employers can nudge employees into higher pension plan contributions by preceding the requisite paperwork—an often momentary decision with long-lasting, important consequences—with a small gift or mood-elevating activity.

### *C. Limitations of Happiness-in-the-Lab Research*

To understand what can and cannot be extrapolated from happiness-in-the-lab experiments that study positive affect, it is important to be disabused of the notion that affect lies on a continuum from intense positive to intense negative. Because intense positive affect is not simply a more extreme version of mild positive affect, identifying a significant effect of mild positive affect on a behavior of interest should not be interpreted as implying an even greater effect of intense positive affect on the behavior of interest.

Further, as is well-established in psychology, positive and negative affects do not necessarily give rise to opposite behavioral effects. At a neural level, positive and negative affect are associated with distinct neurotransmitters: dopamine and serotonin. For example, negative affect should not be expected to reduce productivity even though, as was discussed above, positive affect has been shown to increase productivity (see Ifcher and Zarghamee, 2014). It also warrants mention that there is a literature that explores the impact of negative affect on various outcomes. The impact-of-negative-affect literature has largely been conducted by psychologists with fewer contributions by economists than the impact-of-positive-affect literature.

One interesting example of note to economists is Lerner, Small, and Loewenstein (2004)'s examination of the effects of disgust and sadness on the endowment effect, the tendency to overvalue items in one's possession. The authors find that both disgust and sadness reduce selling prices for participants experimentally endowed with a good; disgust also reduces the willingness-to-pay (WTP) of participants not experimentally endowed with the good, eliminating the endowment effect, while sadness increases WTP, giving rise to a reverse endowment effect. These results demonstrate yet another point: two affects with the same valence (positive or negative) can have divergent effects on behavior. In general, negative affects tend to give rise to more variant effects than do positive affects. Thus, results may not be specific to the particular positive affect induced, for example, amusement, and may apply to a wide range of positive affects.

It is important to consider additional factors that arise when conducting happiness-in-the-lab experiments. First, economists are limited to studying the impact of positive affect on outcomes that can be meaningfully measured in a lab setting. Even with this limitation, there are many research questions that should be of interest to economists that can be studied. For example, as is discussed in the next section, economists have studied the impact of experiential SWB on a series of important outcomes related to preferences (e.g., risk, social, and time preferences), beliefs (e.g., overconfidence and probability weights), and decision-making (e.g., productivity and problem solving). Second, considering experiments that use happiness as the dependent variable, economists are limited to studying the impact of decision-making, outcomes, or

information revelations that can be implemented in a lab setting. As will be discussed in section 5, economists have studied the impact of making decisions (e.g., deciding in a dictator game how much of an endowment to give to a recipient), outcomes, and information revelations (e.g., receiving a smaller payment than another participant in the experiment). Third, the limited timeframe of experiments limits the phenomena that can be studied (e.g., studying a virtuous cycle that unfolds over days rather than minutes). Fourth, as with any lab experiment there are potential concerns regarding external validity; this is why lab results are often supplemented with evidence that extends beyond the lab. For example, the follow-up survey in the Oswald, Proto, and Sgroi (2015) experiment on the effect of happiness on productivity contains items about bereavements and family illnesses; this allows the authors to identify that, compared to participants who have not recently experienced such events, those who have report lower SWB and lower productivity.

#### IV. Happiness as an Independent Variable

##### *A. Methodological Approaches and Considerations*

###### *Typical experimental protocol*

Economists who conduct lab experiments using happiness as an independent variable have largely adapted their methods from psychologists who conduct similar experiments. Such experiments typically include three key components: (i) a mood-inducement procedure intended to induce positive affect (treatment) or neutral affect (control); (ii) an experimental task intended to measure an outcome of interest; and (iii) an “affect check” to confirm that the mood-inducement procedure was successful. In the next subsection, each of these three components is reviewed.

###### *Mood inducement procedures*

Psychologists have developed a series of methods for inducing positive affect, which include watching short film clips, receiving unexpected gifts, looking at pleasant images, reading positive statements, and writing about happy memories or positive self-reflections. Westermann et al. (1996) evaluated eleven mood-inducement procedures. The authors found that film clips—the most common mood-inducement procedure in economics—and writing are the most effective means of inducing positive affect.

In Gross and Levenson (1995), over 200 film clips were evaluated by nearly 500 experimental participants for the efficacy with which they induce each of seven different affects. The participants rated the greatest intensity of each affect they felt during the course of the film clip on a scale from 0 to 8. For each clip, the researchers identified the “target affect” as the strongest

affect elicited by it, and, for each target affect, the two most effective clips for inducing it; these have become the benchmarks for mood inducement. That said, experimenters should consider both the vintage and cultural-appropriateness of a film clip before using it to induce affect. For example, Oswald et al. (2015), who conducted their experiment with English participants, used a film clip of an English standup comic rather than the American comic Robin Williams featured in the Gross and Levenson recommendation. Ifcher and Zarghamee (2011) used a more recent clip of Robin Williams standup than the one in Gross and Levenson.

Table 1 provides a sample of mood inducement procedures, research that has implemented those procedures, and the topic/dependent variable of interest the study was designed to investigate.

Table 1. A Sample of Mood Inducement Procedures with Happiness as Independent Variable

Method	Source	Dependent Variable
Video Clip	Kirchsteiger, Rigotti, and Rustichini (2006)*	Gift-exchange game behavior
	Ifcher and Zarghamee (2011) <sup>†</sup>	Time preference
	Ifcher and Zarghamee (2014)* <sup>†</sup>	Overconfidence
	Stanton et al. (2014)* <sup>†</sup>	Economic choices (gambling decisions)
	Drouvelis and Powdthavee (2015) <sup>†</sup>	Moral judgements towards selfish game behavior
	Oswald, Proto, and Sgroi (2015) <sup>†</sup>	Productivity
	Andrade, Odean, and Lin (2016)* <sup>†</sup>	Market bubbles
	Drouvelis and Grosskopf (2016)*	Pro-social behavior
	Hanley et al. (2017)* <sup>†</sup>	Stated preferences for environmental goods
	Jaspersen and Aseervatham (2017)* <sup>†</sup>	Heuristic thinking
	Proto, Sgroi, and Nazneen (2019) <sup>†</sup>	Cooperation/language
	Lahav and Meer (2020) <sup>†</sup>	Prices in asset markets
	Lange and Dewitte (2020) <sup>†</sup>	Pro-environmental behavior
Gift (Candy/Food)	Isen and Geva (1987) <sup>†</sup>	Risk preferences
	Kahn and Isen (1993) <sup>†</sup>	Variety seeking
	Meloy (2000) <sup>†</sup>	Distortion of product information
	Erez and Isen (2002) <sup>†</sup>	Expectancy motivation
	Oswald, Proto, and Sgroi (2015) <sup>†</sup>	Productivity
Memory Elicitation/Self-Reflective Essay	Erez and Isen (2002) <sup>†</sup>	Expectancy motivation
	Capra (2004)*	Behavior in strategic interactions
	Capra, Lanier, and Meer (2010)* <sup>†</sup>	Bidding behavior in $n$ th price auctions
Images	Pyone and Isen (2011) <sup>†</sup>	Intertemporal choices/cognitive flexibility
	Saadaoui, El Harbi, and Ibanez (2019)* <sup>†</sup>	Trust
Music	Proto, Sgroi, and Nazneen (2019) <sup>†</sup>	Cooperation/language
Success/Failure	Capra (2004)*	Behavior in strategic interactions
	Capra, Lanier, and Meer (2010)* <sup>†</sup>	Bidding behavior in $n$ th price auctions
	Tan and Forgas (2010)*	Fairness/behavior in a dictator game
	Drichoutis and Nayga (2013)* <sup>†</sup>	Risk/time preferences
	Drichoutis, Nayga, and Klonaris (2014)* <sup>†</sup>	Rationality/bidding behavior

(\*) – study also induced a negative mood; (†) – study also induced a neutral mood

### *The importance of using a control-treatment*

No matter the mood-inducement procedure that is used, when conducting an RCT, it is important to have a neutral (placebo) control-treatment that is as similar to the treatment as possible but

intended to induce neutral affect. Specifically, the effect of the treatment should not be assessed by comparing the treatment group to a control group that has not received any intervention in a happiness-in-the-lab RCT. Having a placebo control-treatment enables the experimenter to rule out the possibility that any observed impact of, for example, watching a film clip intended to induce positive affect, is due to the act of watching a film clip or the time it took to watch the clip. To induce neutral-affect, experimenters typically use a film clip of similar length as the film clip intended to induce positive affect. A commonly used neutral-affect film clip features tranquil images of landscapes and wildlife in Denali National Park, Alaska. When experimenters use a self-reflective essay to induce positive affect, experimenters typically direct participants to write a placebo essay about something neutral, e.g., describing daily activities, as the control-treatment.

In discussing the appropriate comparison group for assessing treatment effect, one additional note warrants mention. Given that positive affect and negative affect do not exist on a continuum, nor that the effects of positive affect and negative affect can be expected to be inversely related, a negative affect group is not an appropriate reference group for analysis (Stone and Mackie 2013).

### *Experimental tasks*

In experiments with happiness as the independent variable, if the outcome of interest does not have a standard laboratory elicitation, then the experimenter should keep an eye to incentive compatibility and avoidance of deception when designing a novel experimental task. Otherwise, when possible, the experimenter should use well-developed tasks and techniques to measure the outcome of interest. In Ifcher & Zarghamee (2014), the authors examine the impact of positive affect on overconfidence, using a standard experimental technique for measuring overconfidence in a lab setting. Participants first complete a quiz, knowing they will be paid a fixed sum per correct answer. Before learning their performance, participants are asked to estimate their performance, both absolutely (the number of questions they answered correctly on the quiz) and relatively (the number of questions they answered correctly relative to other participants in their session). Correct estimations are compensated, with the payment increasing in the accuracy of their estimate.

As noted previously, positive affect induced in a lab setting may be short-lived, persisting for as little as 15 minutes. This means that experiments should be sequenced so that participants complete the experimental tasks used to measure the dependent variable immediately after the mood-inducement procedure. This helps to ensure that the induced mood is still activated when participants complete the target task. For example, in Ifcher and Zarghamee (2014)'s study of the effect of positive affect on overconfidence, mood inducement occurred between the quiz

and the subjects' performance-estimation, so that mood inducement could affect overconfidence but not performance on the quiz itself.

### *Affect check*

It is important for the experimenter to confirm that the positive-affect treatment was successful—that it induced positive affect, on average, among participants while the neutral-affect treatment did not. Experimenters generally perform an affect check following the inducement procedure, often after the target task, to ensure that the affect is fully induced while the target task is performed. If the target task is particularly long in duration, the affect check may precede the target task but experimenters should be careful to avoid experimenter demand effects (see de Quidt, Johannes, and Roth (2018)). If an experimenter does not conduct an affect check and the results of the experiment are negative, then it is unclear if the negative result is due to the absence of an impact of positive affect on the outcome variable or to a failed mood-inducement procedure.

A common approach for performing an affect check is to use a short-form version of the Positive and Negative Affect Schedule (PANAS), which asks subjects to indicate to what extent they feel various positive and negative affects, from “very slightly or not at all” to “extremely” on a numerical scale (Watson, Clark, and Tellegen 1988). The PANAS short form typically includes the following positive affects – amusement, arousal, contentment, happiness, interest, relief, and surprise – and the following negative affects – anger, confusion, contempt, disgust, embarrassment, fear, pain, sadness, and tension. As a secondary affect check, experimenters often ask participants whether the mood-inducement procedure made them happier, sadder, or neither; other target affects can be substituted for happiness or sadness.

Experimenters can then conduct econometric tests to determine if the mood-inducement procedure was effective. First, a difference-in-means test can compare the average PANAS-scores of participants in the treatment and control groups for the target affect, e.g., amusement. To further test the robustness of the mood-inducement procedure, another difference-in-means test can compare the average total positive affect – the sum of PANAS-scores for the positive affects – of participants in the treatment and control group. The experimenter should also confirm that the average total negative affect – the sum of PANAS-scores for the negative affects – is statistically indistinguishable for subjects in the treatment and control groups. If the experimenter directly asked subjects if the mood-inducement procedure made them happier, then the experimenter can confirm that the mood-inducement procedure had the intended impact.

When reporting results, experimenters should first confirm successful mood-inducement prior to reporting the main result. Consider Camerer et al. (2016)'s replication experiment of Ifcher

and Zarghamee (2011). The same clip of Robin Williams standup was used as in the original experiment to induce positive affect, but presumably because the experiment was conducted after Williams' much-publicized 2014 suicide, positive-affect inducement was not successful. The subsequent statistical indistinguishability between the outcome of interest (time preference) in the control and treatment groups was to be expected and should not have been interpreted as positive affect having no effect on time preference, as no positive affect was induced (Bohannon *Science* March 3, 2016).

### *Econometric considerations*

In an RCT with a valid randomization procedure, the main result, if positive, should obtain unconditionally – that is, without conditioning on covariates. For example, in a simple experiment, an experimenter should test if the mean of the outcome variable is statistically different for treatment and control groups using a difference-in-means test. When there are repeated measures for each participant and participant-specific averages are not appropriate, regression analysis may be required. In such cases, the dependent variable should be regressed on a treatment indicator variable, and standard errors should be clustered by participant. If the experimenter is examining a series of outcome variables for each participant, then the experimenter should correct for multiple hypothesis testing (additional details regarding correcting for multiple hypothesis testing can be found in List, Shaikh, and Xu 2019; pre-registration of the experiment is also encouraged and can serve to limit the number of hypotheses examined). Of course, the experimenter will need to determine the appropriate econometric techniques based on the experimental design. Once the main result is estimated unconditionally using appropriate econometric techniques, the experimenter can then introduce other components to their econometric analysis – for example, controlling for covariates, restricting the sample to subgroups, and/or adding interaction terms.

Lastly, in experiments that use happiness as the independent variable, experimenters can demonstrate the robustness of the result by regressing the outcome variable on actual affect instead of treatment status. For example, treatment status can be replaced with measures from the affect check, like the PANAS-score of the target affect or total positive affect. Obtaining a significant result in such a regression supports that it is indeed the measured positive affect that is generating the result rather than another difference between participants in the treatment and control group.

### *B. The Impact-of-Positive-Affect Literature*

Over the past 30 years of research on the impact of positive affect, the majority of studies have been conducted by psychologists, most notably Alice M. Isen among others. The results of the RCTs in this literature have broadly documented the beneficial effects of positive affect—



improving decision making and increasing cognitive flexibility, work effort, helpfulness, and creativity, with no evidence of a rise in impulsivity, thoughtlessness, or over-optimism. What often distinguishes the economics from the psychology literature is the focus on outcomes of interest to economists, the use of incentives to elicit preferences, and abstention from deception (for a summary of differences between experimentation in psychology and economics see Hertwig and Ortmann (2001)).

To get a sense of the depth of the psychological literature, consider that Lyubomirsky, King, and Diener (2005) review 27 RCTs that study the impact of positive affect on various measures of creativity and problem solving (e.g., anagram task-performance, problem-solving accuracy, anchoring bias, creative word associations, number of facts used in judgments, information-recall in judgments, and decision-making efficiency). Of these, 20 found documented improved creativity and problem-solving, leading to some convergence on a “happier-and-smarter” theory, whereby positive affect enhances information-processing and cognitive flexibility.

Turning to outcomes of greater interest to economists, positive affect has been shown to increase: work effort and productivity (Erez and Isen 2002; Oswald, Proto, and Sgroi 2015), risk aversion in high-stakes contexts (Isen and Geva 1987), reciprocity (Kirchsteiger, Rigotti, and Rustichini 2006), patience (Ifcher and Zarghamee, 2011), overconfidence in men but not women (Ifcher and Zarghamee 2014), loss aversion (Isen, Nygren, and Ashby 1988), and the frequency and magnitude of bubbles in experimental asset markets (Andrade, Odean, and Lin 2016; Lahav and Meer 2020). Positive affect has also been shown to decrease risk aversion in low-stakes contexts (Isen and Geva 1987), spending, and willingness to pay (Lerner, Small, and Loewenstein 2004; Cryder et al. 2008).

Economists who plan to conduct happiness-in-the-lab experiments should carefully review the psychological literature as there is likely a related paper. Often, even if there is a psychology paper that asks the same or similar research question, there is room for economists to innovate, as psychologists often use different experimental tasks than economists, at times use deception, and generally do not use experimental payments, so that experimental tasks may not be incentive compatible. Too often, when this is the case, economists relegate prior related psychology experiments to footnotes in their literature review—or worse, do not mention them at all. As with the economics-specific literature, economists should justify their experiment’s contributions relative to any relevant experiments by psychologists.

Researching prior literature in a different discipline is complicated by different language used to describe similar phenomena. For example, in Ifcher & Zarghamee (2014), the authors study the impact of positive affect on overconfidence. A sizeable psychology literature examines the impact of positive affect on self-efficacy, which is defined as “people’s beliefs about their capabilities to

produce designated levels of performance that exercise influence over events that affect their lives (Bandura 1994).” Similarly, the psychology literature also considers the impact of positive affect on self-esteem, which is defined as “the extent to which one prizes, values, approves, or likes oneself (Blascovich and Tomaka 1991).” While overconfidence can be thought of as undue perceived self-efficacy or self-esteem, that positive affect has an impact on either does not imply that it has a similar impact on overconfidence.

## V. Happiness as a Dependent Variable

The economics literature that examines happiness as a dependent variable is less well developed than the impact-of-positive-affect literature. Below, the results of some of these papers are reviewed, but first three related literatures should be mentioned. First, there is a large psychology literature that investigates the impact of various therapeutic interventions on happiness (two representative meta-analyses include Bolier et al. (2013) and Sin & Lyubomirsky (2009)); the majority of this literature is presumably of less interest to economists and is thus excluded from this section of the chapter. Second, there is a strand of economic literature that considers the effect of self-control on SWB using observational data and is thus outside the scope of this review (Frey, Benesch, and Stutzer, 2007; Stutzer and Meier, 2016; Gruber and Mullainathan, 2005). Lastly, there is a psychological literature that examines the impact of spending and experiences on happiness and finds, among other things, that spending money on others is more happiness-enhancing than spending money on oneself, and that spending money on experiences is more happiness-enhancing than spending money on goods (see Dunn et al. 2020).

Economists who have conducted happiness-in-the-lab experiments in which happiness is a primary dependent variable have largely focused on two sometimes interrelated research questions:

- (i) What is the impact of behavior on experiential SWB?
- (ii) What is the impact of an information revelation (typically a relative-income shock) on experiential SWB?

Experiments that examine (i) and (ii) include two key components. An experimental task or information-revelation mechanism intended to impact experiential SWB, and an instrument to measure experiential SWB. Many of these studies use a between-subjects design, in which participants complete the experimental task, or receive an information revelation, and then, complete the SWB instrument. A few of the studies instead use a within-subject design, in which participants complete the SWB instrument both before and after completing the experimental

task or receiving the information revelation. These two components are discussed in the next two subsections.

#### *A. Experimental Tasks and Information Revelations*

Experiments that examine the impact of behavior on experiential SWB typically employ standard economic experimental tasks. For example, several studies use the dictator game to examine the relationship between a dictator's SWB and generosity. Charness and Grosskopf (2001) examine the impact of dictator-game play on experiential SWB, with a focus on the effects of choosing an unequal payoff option. In the dictator game, a randomly assigned dictator is given an endowment and decides how much, if any, of it to transfer to a randomly assigned receiver. Konow and Earley (2008) use an anonymous dictator game to isolate causal linkages between happiness, generosity, and psychological well-being. Goff (2021) uses a taking game (a dictator game in which the receiver has an endowment, and the dictator chooses how much of it to take) to determine whether being able to blame an external decision device – in this case, a coin flip – for one's choice can increase happiness. Bosman and van Winden (2002) study the impact of behaviors in a taking game on a set of eleven emotions including happiness; Cubitt, Drouvelis, and Gächter (2011) and Joffily, Masclet, Noussair, and Villeval (2014) use a similar methodology in public goods games in which participants decide their contributions to group funds that benefit all in the group, regardless of individual contributions.

Experiments that examine the impact of an information revelation on experiential SWB vary more widely in design, and in some cases, use a customized experimental task or information-revelation mechanism. For example, McBride (2010) uses a matching-pennies game against a computer to exogenously manipulate participants' income relative to other participants' and their own income in previous rounds. In each of 25 rounds, participants are informed of the penny's type (the probability with which it will show heads versus tails), choose heads or tails, and learn the results and their payments. Before reporting their satisfaction with the round's results, participants in some treatments receive additional information: the average payment of all other participants, or the average payment of participants by penny-type.

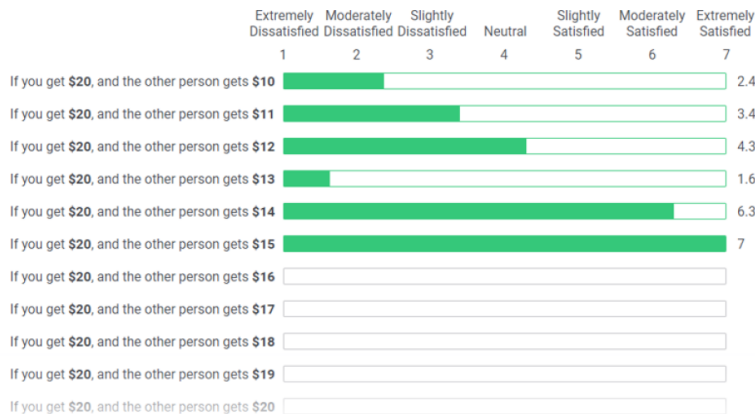
Consistent with the RIE, McBride finds that satisfaction decreases with the average payment of all other participants when this is the only information provided. When average payments are reported by penny-type, satisfaction decreases only with the average payment of subjects with the same penny-type. It is important to note that identification of the RIE is confounded by agency, in that participants' satisfaction (dissatisfaction) may not be attributable to income per se but to feelings of self-congratulations or self-criticism for having made the right or wrong choice *ex post*.

In Ifcher et al. (2020), the authors develop a relative-income revelation mechanism to study the impact of an unconfounded relative-income shock on experiential SWB as measured by the Mood Short Form (MSF), described in greater detail in Section V.B below (Peterson and Sauber 1983). Specifically, participants learn the number of experimental points (2 or 10) they and another participant will receive, where each point is equivalent to \$1. This design enables the authors to compare the SWB-change of two participants receiving the same payoff who differ only in the payoff they learn another participant receives. In a less nuanced version of this experiment, a participant may learn that she will receive \$2 and the other participant will receive \$10. The RIE would attribute a decline in SWB to the participant learning that she will receive \$8 less than the other participant. However, her SWB may decline because she is receiving 8 fewer experimental points than the other participant. The design attempts to rule out this explanation by including a treatment in which points are non-monetized and all subjects receive the same payment.

Ifcher et al. (2020) find that it is SWB-diminishing to learn that the other participant receives a larger—in comparison to an equal—payoff. That is, the participants' mood is made worse from being made "poorer" than the other participant. In contrast, the authors find that it is not SWB-improving to learn that the other participant receives a smaller—in comparison to an equal—payoff. That is, the participants' mood is not made better from being made "richer" than the other participant. Further, the authors find being made poorer is SWB-diminishing regardless of whether the payoffs are monetized or not. That is, the impact of being made poorer in monetized points is no different from the impact of being made poorer in non-monetized points, suggesting that relative income concerns have more to do with relativity than with income. In sum, the authors only find partial support for the RIE; that is, while being made poorer is SWB-diminishing as the RIE predicts, being made richer does not have the predicted SWB-improving effects.

Lastly, Diaz et al. (2021) measure social preferences using stated satisfaction. In the experimental task, participants are presented with three "inequity lists," each item of which is a payment-profiles for the participant and a randomly-chosen, anonymous other participant in the same session. In each profile, the participant receives \$20, while the other participant's payment varies, from \$10 to \$30 in dollar increments (see Figure 1).

Figure 1: An inequity list

**How satisfied would you be?**

Note: In the experiment, participants can see the entirety of the list by scrolling down with their mouse.

Participants' decisions in Diaz et al. (2021) are paid on the basis of one randomly-selected payment profile and not on the basis of their stated satisfaction from it. To demonstrate that participants did not complete the inequity task randomly, the participants are unexpectedly asked to complete the first inequity list again later in the experiment; they are informed that they will receive an additional experimental payment if the stated satisfaction reported at the end of the experiment matches the initial stated satisfaction within a margin of error.

Diaz et al. (2021) find that 75% of participants weakly adhere to the Fehr & Schmidt inequity-aversion model (Fehr and Schmidt 1999). For 86% of these participants, envy (the decrease in stated satisfaction related to disadvantageous inequity) is stronger than guilt (the decrease in stated satisfaction related to advantageous inequity), as predicted by Fehr & Schmidt (1999).

### *B. Measurement of Experiential SWB*

In addition to measuring positive affect through tools such as PANAS, experiments that fall into (i) and (ii) may use a variety of instruments to measure experiential SWB. For example, in McBride (2010), after each matching-penny game, participants report their satisfaction with the results of the game. Specifically, participants are asked "How satisfied are you with the result of this round?" The response scale ranged from one to seven with one signifying "very dissatisfied," four signifying "satisfied," and seven signifying "very satisfied." One potential shortcoming of this approach is that participants are asked about the satisfaction with the result of the game rather than their general satisfaction.

In Ifcher et al. (2020)'s within-person design, participants' experiential SWB is measured using MSF before and after the relative-income shock. The MSF includes four items, each with a five-

point Likert response scale, enabling quick measurement of experiential SWB, which is particularly important when SWB is being measured multiple times. The four items are:

“Currently I am in a good mood.”

“As I answer these questions, I feel very cheerful.”

“For some reason I am not very comfortable.”

“At this moment I feel ‘edgy’ or irritable.”

MSF scores are calculated by summing the four responses with the response-scale reverse-coded for the last two items. Possible scores range from 4 (worst possible mood) to 20 (best possible mood).

As illustrated in Figure 1, in Diaz et al. (2021), for each payment profile, participants are asked: “How satisfied would you be if you get \$20 and the other person gets \$x?” The response scale ranged from one to seven (“Extremely Dissatisfied” =1, “Moderately Dissatisfied” =2, “Slightly Dissatisfied” =3, “Neutral” =4, “Slightly Satisfied” =5, “Moderately Satisfied” =6 and “Extremely Satisfied” =7).

## VI. The Promise of Happiness-in-the-Lab Research

### *A. Reliability and Validity of SWB Measures*

Experimental methods are instrumental in establishing causation between various factors of interest and SWB. However, like other laboratory-based experiments, happiness-in-the-lab research must contend with issues of reliability, construct validity, and external validity. Reliability refers to whether a scale produces scores that are consistent across repeated measurements in the same context or environment; construct validity refers to the ability of a scale to measure the construct of interest; and external validity refers to whether the findings can generalize beyond the specific context of the experiment. In other words, to successfully inform individual behavior, government policy, and indicators of national well-being, SWB measurements must be relatively consistent upon repeat measure, correlate with other attributes and measures known to be associated with happiness, and persist under more general circumstances outside of the lab.

SWB measures are found to be relatively consistent, particularly when scores are expressed as a mean of items, rather than a single item (Diener and Larsen 1984; Diener, Inglehart, and Tay 2013; see “Economics of Happiness” in this handbook for responses to recent challenges to the

validity of SWB measures from economists). The construct validity of SWB measures has also been established, typically through the correlation between participants' self-reported SWB and non-self-report measures (e.g., others' ratings of the participant's SWB or frequency of smiling). The externality validity of happiness-in-the-lab studies, though, is less well-documented. This point will be returned to following a discussion of a third strand of happiness-in-the-lab literature: studies that address the use of SWB as a measure of economic preferences and thereby refine its use as a national well-being indicator.

### *B. SWB Measures as a Proxy for Economic Preferences*

If policies and programs are implemented in an attempt to improve SWB, the fitness of SWB as outcome – beyond these standard reliability and validity concerns – warrants study. If individuals themselves tend to behave so as to maximize SWB, it would then be appropriate for policy to support citizens in this aim. Van Hoorn (2018) uses data from the European Social Survey (ESS) and the European Values Study and World Values Survey (EVS-WVS) to find that SWB measures generally provide an accurate reflection of employment preferences.

A handful of additional happiness-in-the-lab studies attempt to understand the nature and limits of SWB indices as measures of well-being suitable for economic analysis and public policy. Benjamin et al. (2012) examines whether people's choices between alternatives can be explained by the SWB they predict will be generated by each element in the choice set. In the experiment, participants predict their relative SWB from each of two alternative scenarios. For example, in one scenario, subjects are asked to determine which of two jobs would give them "a happier life as a whole": a job paying \$80,000 per year with reasonable hours that allow for 7.5 hours of sleep per night, or a job paying \$120,000 per year with unusual hours that allow for only 6 hours of sleep per night. Participants in within-subject variations of the study are also asked to report which of the options they think they would choose. For most subjects and in most scenarios, hypothetical choice is found to correlate strongly with anticipated SWB, suggesting that individuals are attempting to maximize predicted SWB when choosing.

Benjamin, Heffetz, Kimball, and Rees-Jones (2014) conduct a real-choice version of the within-subject analysis, comparing graduating medical students' real rankings of medical residency programs to their predictions of various attributes of those programs and their SWB in them. The predictions and choices are used to calculate marginal utilities of the residency attributes. Predicted SWB is found to be the best, but not the only important predictor of actual preference-rankings. Choice is better predicted by life-satisfaction and Cantril's-Ladder measures of evaluative SWB than by experiential measures. The authors also find that SWB measures underweight the prestige of residency programs and overweight social life and the extent of "life seeming worthwhile during the residency." While this study sheds some light on the relationship

between SWB and revealed-preference, SWB is only considered prospectively and not contemporaneously.

To determine the marginal utilities of various aspects of well-being, Benjamin, Heffetz, Kimball, and Szembrot (2014) conduct an online survey of over 4,600 adults in the United States. The 136 aspects they consider span all three types of SWB and range from commonly used SWB measures (e.g., “how much of the time you feel happy”) to more nuanced characteristics of well-being (e.g., “your sense of discovery and wonder” and “the amount of order and stability in your life”). The participants make a series of hypothetical choices between two alternatives which differ only in their relative contributions to a small subset (2, 3, 4, or 6) of well-being aspects. All other characteristics are described as being equal across the two alternatives. Participants not only state their preferences over the options, but also state the relative strength of their preferences (“much prefer”, “somewhat prefer”, “slightly prefer”). The results demonstrate the importance of a range of aspects of well-being, but the relative importance of these aspects differs across sociodemographic groups.

More recently, Benjamin, Cooper, Heffetz, and Kimball (2019) perform an internet survey that asks participants to rate 204 aspects of well-being within seven well-being “themes” – (i) satisfaction, (ii) affect, (iii) growth, (iv) autonomy, (v) job, (vi) calmness, and (vii) belonging. This work continues to highlight that the perceived importance of subsets of well-being differs across sociodemographic groups. It also furthers the attempt to aggregate various measures of well-being into a comprehensive well-being index using marginal rates of substitution between various themes.

This body of research has begun the work of demonstrating the enormous potential of using SWB measures to infer preferences and to use these inferred preferences (van Hoorn 2018) to inform indices that better reflect societal well-being. For example, the marginal utilities derived from studies such as Benjamin, Heffetz, Kimball, and Szembrot (2014) can be used as weights in constructing indices of national well-being.

## VII. Summary

Happiness-in-the-lab research is part of a larger body of happiness research that seeks to understand the causes and consequences of SWB. The advantage of experimental over observational methods is that they can be used to identify causal relationships between happiness, its determinants, and its consequences. As national indicators and policies increasingly focus on SWB, understanding causal linkages is paramount. In addition, Benjamin, Heffetz, Kimball, and coauthors’ findings suggest that SWB has important real-world implications. This chapter summarized some of the techniques used to test hypotheses about happiness in a



laboratory setting and introduced a wide variety of studies from both the psychology and economics literature.

There is still much to be learned from happiness-in-the-lab studies. The examination of relationships between happiness and time preference (e.g., patience), risk preference, and social preference is far from complete, for example. Similarly, more work is needed to continue to disentangle RIE from inequity aversion. However, the coupling of lab experiments with field experiments presents the biggest opportunity for the near future. Artefactual, framed, and natural experiments would all help to provide some external validation of happiness-in-the-lab research. Areas for future research that might produce fruitful pairings between lab and field include building on studies that examine the efficacy of technology-based SWB-nudges. Kessler, McClellan, Nesbit, and Schotter (2021) estimate the effect of mood on charitable giving, willingness to pay for a consumer good, risk taking, and trust by eliciting experimental economic measures of these outcome variables on tablets from sports fans during commercial breaks of an American football game at a sports club in New York City. Howells, Ivtzan, and Eiroa-Orosa (2016) conduct an RCT to determine the effectiveness of the interventions of a mindfulness smartphone app relative to a control intervention, bringing the control of a laboratory experimental procedures to responses collected from participants as they go about their daily lives.

The chapter started in search of causal-inference methods to better inform policies aimed at improving welfare. Frijters et al. (2020) build the case for wellbeing to be the ultimate goal of policymaking, and for survey measures of well-being to complement cost-benefit analyses in government decision-making. The authors write: “We would like to move to a system wherein councils, firms, households, and institutions learn from the best practices around the country and beyond. This requires both an experimental mindset and institutions that gather the evidence on what has worked. In the medium run, we thus expect a flood of experimentation by individuals, firms, communities and departments in all areas of life to see what improves wellbeing. Information on successful and failed examples can be collected by the What Works Centre for Wellbeing (<https://whatworkswellbeing.org/>), as well as other institutions that make it available to others.” The “flood of experimentation” has been moved along substantially by Daniel Benjamin, Ori Heffetz, Miles Kimball, and co-authors’ rigorous attempts to identify the appropriate items for policymakers to use to capture well-being comprehensively and without bias. An important agenda for happiness-in-the-lab experiments is to further explore how people weigh SWB and other goals, both in the lab and field, both for themselves and for society, and to ensure that the measures of well-being introduced into policy-making do not suffer from the same sacrifice of substance for simplicity that monetary measures have been shown to.

## Acknowledgments

Responsible Section Editor: Milena Nikolova

The article has benefitted from valuable comments of the editors, Michalis Drouvelis, Daniel Sgroi, and Adriaan Soetevent. We are grateful for research assistance provided by Rachel Dentler. There is no conflict of interest.

## Cross References

The Economics of Happiness

Measuring Subjective Wellbeing

Design and Analysis of Experiments

The Easterlin Paradox

Inequality and Happiness

Wage Satisfaction and Reference Wages

Causality

Happiness vs. Utility

Happiness and Partnerships

Inequality Measurement: Methods and Data

Measuring Welfare, Inequality and Poverty with Ordinal Variables

Clustering Methods for Statistical Inference

Simultaneous Equations and Instrumental Variables Models

Overconfidence in Labor Markets

Reference Points and Effort

Personality, Emotional Intelligence, and Rationality

Fair and Unfair Income Inequality

The Formation and Malleability of Preferences and Noncognitive Skills

Health Inequalities and Causality

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