



The relationship between innovation and subjective wellbeing

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ABSTRACT

Innovation should improve people's lives. The links made between innovation and subjective wellbeing (SWB) have, however, rarely been made. We use a representative survey of the British population and new primary data to explore the relationship between innovation and SWB. We show that creativity and SWB are correlated. This applies to questions related to self-reported creativity and for working in creative environments. More research is needed to determine the relative effects of each direction of causality in the relationship between innovation and SWB in the workplace and in life generally.

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1. Introduction

One of the key questions for academics and policy-makers is how best to measure and value the impact of innovation, defined here broadly as “*the successful exploitation of new ideas*” (NESTA, 2008). To date, much of the measurement of innovation has focussed quite narrowly on the inputs to innovation. The Advisory Committee on Measuring Innovation in the 21st Century Economy (2008, p. 17) recognises that “*more work needs to be done to define appropriate outcome measures and analyze their utility and effectiveness*”. The traditional measures of innovation have been expenditure inputs (e.g. investment in R&D as a percentage of GNP; see targets set by European Commission, 2002) yet such measures do not capture the impact of the innovation process on outcomes (Coombs et al., 1996, Morlacchi and Martin, 2009). The main aim of this paper is to consider whether and how the consequences of innovation could be measured and valued in terms of subjective wellbeing (SWB) and, additionally, whether SWB is important to innovation.

There are three main accounts of wellbeing: objective lists, preference satisfaction and mental states (Parfit, 1984). Objective list accounts, favoured by many philosophers, argue that wellbeing is highest when a person meets his material, social and psychological needs (e.g. Sen, 1999). So, innovation would be incorporated into this account of wellbeing through its impact on health, education, income etc. Preference satisfaction accounts, favoured by

many economists, argue that an individual's life goes better if she gets more of what she wants (e.g. Harsanyi, 1996). So, innovation in this context is related to people's willingness to pay for innovative goods or the increase in income from innovation that allows them to satisfy more of their preferences. Mental state accounts, favoured by many psychologists, argue that an individual's life goes better if it is experienced more positively by the individual (Diener et al., 1999). So, innovation in this account would be the impact that innovation products, etc. have on people's self-reports of their wellbeing.

There has been considerable debate about the merits of these accounts and we cannot hope to add further to that debate here. What we can say, however, is that mental states are important to individuals and policy-makers and we should like to see the effects of interventions – and innovation – show up in someone's SWB, somewhere and at some point. For instance, the recent Stiglitz et al. (2009) report has suggested that “*it is possible to collect meaningful and reliable data on subjective as well as objective wellbeing. Subjective wellbeing encompasses different aspects (cognitive evaluations of one's life, happiness, satisfaction, positive emotions such as joy and pride, and negative emotions such as pain and worry): each of them should be measured separately to derive a more comprehensive appreciation of people's lives*”.

So we define mental states (or SWB) broadly in terms of assessments of how we think and feel about life (Diener et al., 1999). SWB can be measured by global evaluations of life overall and also by experiences of daily affect (Kahneman and Riis, 2005). The former is an assessment of how well life is going for each individual (Dolan et al., 2008) and the latter is an assessment of affect over a specified duration of time (Kahneman et al., 2004; White and Dolan, 2009; Kahneman and Deaton, 2010). Such SWB measures

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have been validated against neurological evidence (Davidson, 2004), physiological evidence (Stephens et al., 2005), and a range of behaviours (Lyubomirsky et al., 2005), including suicide (Daly and Wilson, 2009).

Therefore, and without denigrating the other accounts of wellbeing, this paper focuses on wellbeing as mental states. The focus of this paper is on three main relationships that have yet to be analysed in a representative survey of individuals: (i) is there a relationship between innovation and SWB in the general population?; (ii) does any innovation–SWB relationship rely on the measures of innovation and SWB that are used?; and (iii) to what extent are more creative workplaces conducive to higher SWB? We attempt to answer these questions using data obtained within the U.K. these questions are novel from the perspective of the SWB literature, and the innovation literature, and attempts to marry the two literatures together.

In Section 2, we discuss what is already known about the impact that SWB has on innovation and the impact that innovation has on SWB. As might be expected, remarkably little is known about causality in the relationship between innovation and different measures of SWB, especially in a representative population. In Section 3, we discuss our data and methodology that we use to address these gaps in the literature. In Section 4, we discuss our analyses of a secondary dataset (the British Household Panel Survey) and our own primary data that demonstrates how differing measures of SWB are correlated with self-reported innovation and creativity. We certainly need new studies to better understand the causal relationships between innovation and SWB, but this present study demonstrates a strong link between innovation and SWB. We do not know whether there is a causal connection and are not claiming such a thing in this paper. So we need to make better and innovative use of a range of methods, including natural and field experiments to understand the direction of the relationship between SWB and innovation. In Section 5, we provide some examples of where experiments might prove helpful, and we provide some concluding remarks in Section 6.

2. Existing evidence on the relationship between innovation and SWB

2.1. From SWB to innovation

A literature search of EconLit with the words “innovation” and “wellbeing” or “happiness” did not find any studies. Two relevant studies were found when we used the terms “creativity” and “positive affect”. Frederickson (1998) suggests that positive affect increases the scope of attention and the scope of cognition. Isen (1999) suggests that positive affect makes additional cognitive material available for processing and for increasing cognitive flexibility, which further increases the number of cognitive elements available. When positive moods were induced by a stimuli (e.g. gift, music, etc.), individuals who had the stimuli had higher levels of creativity (Isen, 1999). Other experiments with students show similar results (e.g. Isen et al., 1987; Burroughs and Mick, 2004).

The link between positive affect and innovation is not straightforward though. It seems that positive affect increases the consideration of multiple relevant factors in a task (Aspinwall, 1998) but for unpleasant or boring tasks, positive affect does not increase people’s creativity more than negative affect (Isen et al., 1985, 1992; Isen, 2000). In terms of risk, it seems that positive affect leads to riskier behaviour when the risk is hypothetical but greater risk aversion when the risk is real (Isen and Geva, 1987; Isen and Patrick, 1983).

There has been one seminal field study by Amabile et al. (2005) using a longitudinal study of 222 employees across seven

companies each day over a 19-week period. They measured positive affect by using six self-report items (Russell, 1980) as well as measuring happiness and satisfaction with each day. They measured daily creativity by self-assessed creative thought and problem-solving and monthly creativity by peer assessment. The results suggest a positive linear relationship between positive affect and creativity (but no opposite relationship with negative affect). Higher positive affect was also found to be a direct consequence of creativity.

This study suggests that SWB precedes creativity, which supports the neurological studies that stipulate that positive moods in conjunction with incubation periods (i.e. sleep) enforce memory and enhanced performance in tasks (Wagner et al., 2004). It also supports the psychological evidence that positive affect is an effective retrieval cue for positive material in memory, but that negative affect is not an effective cue for negative material (Isen et al., 1978; Snyder and White, 1982). The link between SWB, memory, and creativity might not be so straightforward though given that healthy people with low levels of dopamine receptor activity in the brain (associated with mental illness) are more divergent thinkers (de Manzano et al., 2010; see also Chermahini and Hommel, 2010).

Positive affect at work is highly related to overall job satisfaction (Judge and Ilies, 2004), and thus it may be reasonable to assume that creative workplaces would be more pleasant places to work (Bryson et al., 2009, examines this from analysing changing workplaces that are unionised). In general, most research using specific population samples show a positive correlation between positive affect and creativity (Barsade and Gibson, 2007). It has also been found that people who report themselves as being time pressured in work also report themselves as being less creative (Amabile et al., 2002; Huhtala and Parzefall, 2007), although the relationship between pressured at work at negative affect has not been fully explored. There are, of course, potential problems of response bias and acquiescence bias, which would create an erroneously significant correlation between the two measures. In general, there is a lack of evidence on causality, a lack of evidence on using different measures of SWB (most have used general positive affect), and a lack of evidence from representative samples of a population.

2.2. From innovation to SWB

The obvious link from innovation to SWB comes in the form of economic growth. Endogenous growth theories stipulate that the interaction between technology and the structure of the economic system induces economic growth (Grossman and Helpman, 1991; Aghion and Howitt, 1998). So, if innovation has direct effects on economic growth (see Galor and Tsiddon, 1997) and economic growth (or income) has direct effects on SWB (see Frijters et al., 2004; Stevenson and Wolfers, 2008), then innovation may well have causal consequences for SWB. This link relies on measuring the tangible inputs of innovation on economic growth and SWB. There may also be important intangible inputs to innovation that affect economic growth and that also directly impact upon SWB. It is this direct link to SWB that we know very little about.

Since Easterlin (1974), the research examining the role of income on SWB has suggested that income increases both evaluations and experiences up to a point. The recent research suggests that SWB always increases in income (Deaton, 2008; Sacks et al., 2010). Whether the income–SWB relationship becomes flat or increases very slightly at high levels of income is, for the purposes of this, a somewhat moot point – that the SWB gains from increases in income become very small is enough motivation to look more closely at the impacts of innovation. If income does not have much of an impact beyond a point, then people maybe not spending their income correctly (see Dunn et al., 2011) and/or the increased income comes at a price in terms of other things that reduce

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