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How does happiness relate to economic behaviour? A review of the literature



Tom Lane

Department of Economics, University Park, University of Nottingham, NG7 2RD, UK

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ABSTRACT

This article reviews research on the relationship between happiness (subjective wellbeing) and economic behaviour. I describe how experimental and non-experimental methods have been used, across the social sciences, to investigate how happiness drives, and is driven by, particular behavioural tendencies. I consider interpersonal behaviour (selfishness, trust and reciprocity) and individual behaviour (risk and time preferences). Regarding interpersonal behaviour, a general conclusion is that happiness results from pro-social behaviour. Happiness negatively correlates with selfishness and positively correlates with trust; in both cases there is stronger evidence that the behaviour is a cause of happiness than a consequence of it. Individuals also gain happiness from inflicting costly punishment on those who have harmed them, although being happy reduces the degree to which people are willing to dole out such punishment in the first place. Regarding individual behaviour, the relationship between happiness and risk preferences remains unclear despite a large body of research on the topic, while there is evidence that happiness affects time preferences by reducing impatience. In all cases, I draw distinctions between the long- and short- term relationships between happiness and behaviour.

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1. Introduction

There is much in common between behavioural economics, the field applying psychological insight into human behaviour to explain the economic decisions people make, and happiness economics, the study within economics of happiness and its relationships with other factors. Both are heterodox but increasingly influential fields within the discipline; both have produced important empirical findings which challenge the received neoclassical wisdom that individuals are capable of maximising their wellbeing without systematically making mistakes. This paper reviews research at the interface of the two fields which has attempted to address how economically-relevant behavioural tendencies relate to happiness. This body of research is interested in how the tendency to behave in specific ways increases or decreases one's level of happiness, and conversely how one's level of happiness increases or decreases the likelihood of one engaging in such behaviours. In particular, how does behaving selfishly, trustingly, reciprocally, risk-aversely or impulsively affect one's happiness, and how does being happy affect the likelihood of one behaving in such ways?

Understanding the relationships between happiness and economic behaviour is of intrinsic interest to academics, across the

social sciences, as well as laypeople. Happiness is a concept of such fundamental importance that it has preoccupied philosophers and religions for millennia. Happiness, and how it can be maximised, has long been of interest to economists, too. Utility entered economic analysis as a close synonym of happiness; although the two concepts later departed from one another, in recent decades economists have developed a renewed interest in happiness and ways it can directly be measured.

Being happy is an important goal for most people; according to one view, it is the ultimate goal to which all others are aimed (Layard, 2011). Understanding the causes of happiness is, therefore, beneficial to society. Policymakers concerned with helping people enhance their future happiness have an interest in knowing which types of behaviour exert a positive hedonic effect and are therefore worth encouraging. Furthermore, understanding the consequences of happiness is important. There is mounting evidence that emotions, including happiness, exert considerable influence on decision-making. Taking this into consideration, behavioural economists have in recent years been paying increasing attention to the study of happiness.

There is now a substantial amount of available evidence on how happiness relates to economic behaviour. The literature is sufficiently advanced that it is worth taking stock by bringing all this evidence together, and such is the purpose of this paper. I aim to

E-mail address: lextl9@nottingham.ac.uk

summarise a series of findings of cross-disciplinary and cross-field interest: to show how behavioural scientists and their methodologies have contributed to knowledge on human happiness, and how happiness researchers have aided our understanding of human behaviour.¹ The research discussed in this paper is not restricted by academic discipline. Much of the recent work is within economics and business-related disciplines, but psychologists have been studying the effect of emotions on behaviour for decades (see e.g. *Iсен, 2008*). Other studies come from political science, sociology, ecology, neuroscience and medical sciences. The research discussed is furthermore not restricted by the methods it uses; I outline the main research methods employed in this literature in [Section 2](#), and also raise important methodological considerations relating to findings as they arise throughout the paper. The literature search for this paper was concluded in December 2016.

This paper focuses on behaviours which both 1) are of great interest to behavioural economists, and 2) have been most researched in relation to happiness.² I first address interactive behaviour. Specifically, I consider: selfishness (and by extension its counterpart, generosity), the prioritisation of one's own material wellbeing over that of others; trusting behaviour, wherein individuals invest time, money or effort on endeavours which depend on the assistance of others; and reciprocity, the act of punishing or rewarding others for behaviour which has harmed or benefitted oneself. I then turn to individual behavioural traits: risk preferences and time preferences. It is true that some of these behaviours are interrelated – for instance, trusting behaviour may be affected by one's risk preferences and level of generosity. Nevertheless, this paper sub-divides the discussion into topics as they are generally defined in the literature itself. In all cases, I focus not only on identifying associations between happiness and behavioural tendencies, but also on attempting to discern the direction of causality. Aware that the causes and effects of short-lived and long-lasting happiness may differ (see e.g. *Kahneman and Riis, 2005*), this paper also systematically highlights whether research has linked happiness to behavioural traits on a long- or short-term basis.

In short, this paper shows that happiness is inversely related to selfishness; the two may well be co-dependent, but the evidence that selfishness causes unhappiness is stronger than the converse ([Section 3](#)). Trust is positively correlated with happiness, and again there is more evidence that trust causes happiness than the reverse ([Section 4](#)). Unhappiness enhances the degree to which individuals are willing to engage in negative reciprocity by inflicting costly punishment on those who have harmed them; but exacting such retribution is apparently beneficial to one's subsequent wellbeing, demonstrating a negative feedback loop between happiness and negative reciprocity. However, the limited available evidence suggests a different relationship between happiness and the ten-

dency to engage in positive reciprocity by rewarding those who have acted to one's benefit, with each exerting a positive effect on the other ([Section 5](#)).

There is a large literature on the relationship between happiness and risk-preferences, but as [Section 6](#) shows it yields inconclusive findings, with competing schools of thought contending that happiness either increases or decreases risk-aversion. This lack of consensus is examined and possible explanations for it are discussed. There is moderate evidence that happiness increases one's patience over monetary rewards, which is reviewed in [Section 7](#). Finally, [Section 8](#) concludes; it highlights the important general finding that happiness appears to result from socially beneficial behaviour, and also discusses possible future research directions.

2. How researchers have investigated relationships between happiness and economic behaviour

For the great majority of studies in this literature, happiness is elicited through the self-reports of individuals in questionnaires. The scientific validity of such subjective wellbeing (SWB) measurements is a controversial issue. I will not attempt to fully address the controversy here (for extensive discussions, see e.g. *Mackerron, 2012; Diener et al., 2013*) but will briefly note the following, in defence of the use of SWB: self-reported happiness correlates with happiness as judged by observers (*Diener, 1984; Pavot et al., 1991; Sandvik et al., 1993; Schneider and Schimmack, 2009*); it also correlates with such objective variables as brain activity (*Urry et al., 2004*), heart rate (*Shedler et al., 1993; Steptoe et al., 2005*), physical stress (*Steptoe et al., 2005*), Duchenne smiles (*Ekman et al., 1990*), suicide (*Di Tella et al., 2003*) and antidepressant usage (*Blanchflower and Oswald, 2011*), all of which are at least plausibly related to happiness; SWB is reasonably stable within individuals over time (*Fujita and Diener, 2005; Schimmack and Oishi, 2005; Krueger and Schkade, 2008; Michalos and Kahlke, 2010*); it predicts future behaviours such as divorce (*Gardner and Oswald, 2006*); and it consistently yields theoretically plausible results, such as the ubiquitous finding that happiness is negatively associated with unemployment.

This paper is, therefore, written from the intellectual position that SWB measures, while imperfect, are worth taking seriously. Occasionally, studies in this literature use physical happiness measures such as brain activity (e.g. *De Quervain et al., 2004; Harle et al., 2012*) or levels of serotonin (*Crockett et al., 2013*) or cortisol (*Dunn et al., 2010a*), instead of or in addition to SWB. However, given the predominant use of self-reported happiness in this literature, for simplicity I will hereafter use happiness and SWB synonymously. Note that SWB measures can relate either to immediate happiness, i.e. mood (e.g. 'how happy are you right now?'), or to long-term happiness (e.g. 'how happy are you these days?'; 'how satisfied are you with your life?'). Research on the short-term causes and effects of happiness will elicit immediate SWB, while research on its long-term relationships with behaviours will elicit long-term SWB.

How economic behaviour is measured in this literature differs. A large strand of the literature takes data from social surveys to measure associations between happiness and self-reported behavioural traits, such as selfishness or trust. This approach requires one now to accept the validity not only of self-reported happiness but also of self-reported behaviour. This paper will cautiously do so because, while the measurement of these variables may be noisy, there is no compelling reason to believe the accuracy of behavioural self-reports should be systematically biased across happiness levels (which would potentially lead to spurious correlations). However, it seems a reasonable assertion that laboratory experiments – which constitute the other main research method in this literature – enjoy a general advantage in being able to ob-

¹ Note that this paper is not an attempt to review all research at the interface of behavioural and happiness economics. For instance, it does not discuss studies such as *Carter and McBride (2013)* which use subjective wellbeing measures as an alternative barometer with which to test findings from behavioural economics. I also do not discuss happiness research which has inferred the existence, in general, of certain behavioural tendencies, such as reference dependence (e.g. *Hagerty, 2000*). Specifically, the focus is on research identifying how happiness affects the likelihood of an individual behaving in a particular way, and vice versa.

² One broad area which is certainly of great interest to behavioural economists is bounded rationality. Behavioural science has identified a wide range of behavioural tendencies resulting from deviations from rationality. However, this paper does not include a section on bounded rationality, because the topic has not yet received sufficient research in relation to happiness (beyond the assumption that less rational behaviour reduces happiness through material losses) from which to build a synthesis warranting standalone discussion. Some relevant research on overconfidence and time-inconsistency is discussed in the context of risk and time preferences. For research on the relationship between happiness and the endowment effect, see *Lerner et al. (2004)*, *Lin et al. (2006a)* and *Cavazotte et al. (2009)*. For research showing happiness is inversely related to preference reversals, see *Drichoutis et al. (2010)*.

serve actual behaviour. Note, though, that some experiments elicit self-reported behaviour, or observe behaviour in economic tasks where the payoffs are hypothetical, while there are also some non-experimental studies which observe real behaviour (e.g. Kliger and Levy, 2003, study stock market activity).

Most studies using survey-response or naturally-occurring data can only assert correlation rather than causality, although there are some exceptions where researchers have taken advantage of natural experiments (Meier and Stutzer, 2008), lagged independent variables (e.g. Thoits and Hewitt, 2001), or instrumental variables (e.g. Kamstra et al., 2003; Borgonovi, 2008). Experiments generally have greater potential to investigate causality. Experimentally investigating the causal effect of happiness on behaviour is commonly done by exogenously manipulating subjects' happiness in advance of behavioural tasks, using mood-inducement procedures. This is often done by showing subjects video clips expected to either raise or lower their happiness; other methods include asking subjects to recall or write about happy or unhappy experiences. The effectiveness of the mood-inducement is validated by subsequently asking subjects to report their immediate happiness. Typically, such experiments will use for comparison a control treatment in which a neutral mood is induced, although some experiments simply employ one induced-happy and one induced-unhappy treatment. Any significant differences in behaviour between treatments can then be attributed to the different levels of happiness exogenously induced in subjects.

Regarding the causal effect of behaviour on happiness, some experiments attempt to assess this by measuring subjects' self-reported immediate happiness before and after a behavioural task, thereby calculating how it changes over the course of the task. The change in happiness can either be measured within subjects (eliciting everyone's SWB twice) or between subjects (eliciting some subjects' SWB beforehand and some afterwards, and measuring the average difference). Experiments can then discern whether the increase (or decrease) in happiness is greater for individuals who choose to act one way or another.

Interpreting this as a causal effect of the behaviour on happiness is potentially problematic, however. Subjects are able to self-select into behaving one way or another, so differences in mood-improvement may be driven not by the behaviour itself, but by underlying differences between those choosing different behaviours. For instance, subjects who choose to behave generously may tend to gain greater enjoyment from participating in behavioural experiments than subjects who choose to behave selfishly; the generous subjects would therefore report a greater mood-improvement, but this would not in fact be caused (wholly) by their generous behaviour. While this is certainly a possible source of misidentification of significant results, I would argue it is a reason for treating such results with caution rather than disregard. Absent of theoretical arguments on why people who behave in one way should have a systematically greater incidental capacity for mood-improvement than those who behave in another, greater mood-improvement reported by one group is at least suggestive of a causal impact on happiness of their chosen behaviour.

A more likely occurrence in such experiments may be the misidentification of null results due to self-selection. This could occur if one behaviour (A) would tend to bring greater happiness to most people than an alternative behaviour (B), but the minority of individuals for whom the opposite is the case choose their happiness-maximising behaviour (B), and both behaviours therefore lead to similar changes in the happiness of those choosing them. Indeed, correctly identifying causal effects of behaviour on happiness using methods of this sort relies on some subjects failing to choose happiness-maximising actions, presumably through errors in affective forecasting (Wilson and Gilbert, 2005).

An alternative method some experiments use is to randomly assign some subjects to behave in one way and others to behave in another. For instance, Dunn et al. (2008) assigned some subjects to behave selfishly and others to behave pro-socially. This removes the self-selection problem, but simultaneously raises the possibility that subjects will not feel the true effect of a behaviour because it is not made through choice. Indeed, there are some behaviours, such as trust, that people cannot meaningfully be compelled into.

Another difficulty experiments face is in identifying the effects on behaviour of happiness beyond the immediate present. Mood-inducement experiments reveal the effects of short-term fluctuations in happiness on behaviour, but it can be questioned whether the effect on one's behaviour of being in a good mood will be the same as the effect of being a generally happy person in the long term. One approach some experiments have taken is to compare the behaviour of clinically depressed (and therefore long-term unhappy) subjects with that of healthy control participants. These studies infer causal effects of depression on particular behaviours on the basis of an implicit and perhaps questionable assumption that depression is an exogenous variable, and not something which may be influenced by the behaviours in question. Interestingly, when these experiments have found significant effects, they have sometimes been in the opposite direction to those of mood-inducement studies. Assuming that the behaviours in question are *not* causes of depression, these inconsistencies may suggest that happiness exerts opposite effects on some behaviours in the short and long term, or they may imply that clinical depression is a special case, with effects which do not always generalise to unhappy but mentally healthy people.

Similarly, it is difficult for experiments to establish the effects of behaviour on happiness in the long term. They can investigate the immediate effect behaving in a particular way has on one's mood; they are unlikely to be able to confirm whether behaving that way throughout one's life has the same effect on one's long-term happiness. As a result of these difficulties, more is known about how economic behaviour relates to short-term happiness than to long-term happiness. Throughout this paper, clear distinctions are drawn between the two.

3. The relationship between happiness and selfishness

This section reviews evidence on the relationship between happiness and selfishness. I define selfishness as the prioritisation of one's own material wellbeing over that of others. For readability, I will sometimes also refer to generosity, which I consider to be the converse of selfishness.³ Note that this section does not cover all aspects of pro-sociality, which is a broader concept encompassing other behaviours such as trust and costly punishment – these other behaviours are addressed in later sections.

3.1. Correlational studies

The evidence from social surveys strongly suggests that a negative correlation exists between SWB and selfish economic behaviour. Dunn et al. (2008) found that, amongst a representative sample of Americans, reported levels of spending on gifts for others and on charity correlated with SWB. Aknin et al. (2013a) generalised this result on an international level: they took data from the Gallup World Poll in 139 countries, where respondents were

³ There may be many different motivations for behaving selfishly or generously – for instance, inequality aversion (Fehr and Schmidt, 1999), guilt aversion (Charness and Dufwenberg, 2006) or warm glow (Andreoni, 1990). How the preponderance of such motivations differently relate to happiness is not addressed here, as this has not been investigated in the literature.

asked whether they had donated to charity in the past month. Answering yes to this question significantly predicted SWB across the whole sample, and also did so within 71 of the countries when they were analysed in isolation. The overall effect was qualitatively large – giving to charity had the equivalent impact to doubling one's household income – and was of similar strength in rich and poor regions.⁴ Separate studies in Thailand (Pholphirul, 2015), China (Jiang et al., 2016) and Finland (Tanskanen and Danielsbacka, 2016) also found happiness correlated with self-reported charitable behaviour. Ferrer-i-Carbonell and Gërçhani (2016) observed a negative correlation between SWB and self-reported tax evasion in former communist countries.⁵ A positive link between generosity and happiness was also found by Phelps (2001) – in this case the generosity was not self-professed but elicited by the psychological Thematic Apperception Test. In lab experiments, Pulcu et al. (2015) observed less generous charitable giving by subjects with clinical depression than by healthy subjects, Bolle et al. (2014) found stealing in a vendetta game to be negatively correlated with happiness, and Joffily et al. (2014) identified a positive correlation between happiness and contributions in a public goods game, although no significant correlation between happiness and generosity in the dictator game was found by Charness and Grosskopf (2001).

The relationship extends also to individuals' use of time: those who allocate their time to the benefit of other people tend to be happier. From a meta-analysis of 29 studies investigating the relationship between happiness and volunteering in old age, Wheeler et al. (1998) deduced the average elderly person who did not volunteer was less happy than 70% of elderly people who did (controlling for health weakened but did not eradicate this effect). More recent studies using survey data have continued to consistently find positive correlations between volunteering and happiness amongst the elderly (Windsor et al., 2008; McMunn et al., 2009; Dulin et al., 2012; Pilkington et al., 2012; Taghian et al., 2012; Becchetti et al., 2016; Tanskanen and Danielsbacka, 2016) and across all ages (Mellor et al., 2008; Tov and Diener, 2009; Brown et al., 2012; Okun et al., 2011; Binder and Freytag, 2013; Binder, 2015; Gimenez-Nadal and Molina, 2015; Matsushima and Matsunaga, 2015; Binder and Blankenburg, 2016). Furthermore, many studies have identified a positive link between happiness and the extent to which individuals make voluntary efforts to assist colleagues and employers at work (Organisational Citizenship Behaviour); the meta-analyses of Organ and Ryan (1995) and Borman et al. (2001) showed mild positive correlations across this literature. It has also been found that happier people report spending more time helping others outside of any workplace or formal volunteering environment (Becchetti et al., 2016; Oarga et al., 2015).

Happiness appears, furthermore, to be positively related to environmentally friendly behaviour, which generally requires the individual to forgo some time, effort or money. Cross-sectional studies, based on surveys which elicit self-reports of environmen-

tally responsible actions, have found this relationship in the US (Brown and Kasser, 2005), Sweden (Jacob et al., 2009; Kaida and Kaida, 2015), Mexico (Corral-Verdugo et al., 2011), China (Xiao and Li, 2011), Spain (Suarez-Varela et al., 2014), Australia (Ambrey and Daniels, 2016), South Korea (Choi, 2016), India (Tiwari, 2016) and across a diverse sample of countries in the World Values Survey (Sulemana, 2015a).

While the above evidence strongly indicates a negative correlation between happiness and selfishness, it leaves open the direction of causality: does selfishness cause unhappiness, or vice versa? This question is addressed in the following subsections.

3.2. Studies investigating the effect of happiness on selfishness

In contrast to the correlational studies, which are predominantly based on the analysis of social survey data, the great majority of research into the effect of happiness on selfishness is experimental. A decades-old literature in psychology has consistently shown that subjects are more willing to help others when induced into a good mood (see e.g. Eisenberg, 1991). However, there is less evidence on whether the causal link from immediate happiness to generous behaviour holds in financial contexts. What evidence does exist is mixed.

Several studies have investigated the effect of short-term happiness on selfishness in the dictator game by inducing positive or negative moods in subjects beforehand. Some have suggested that, in fact, making people happier increases their selfishness. Tan and Forgas (2010) found subjects in a positive mood made more selfish allocations than those in a negative mood; the effect was confirmed using two different forms of mood-inducement, and was found to be particularly strong when a social norm of selfishness was presented to subjects. A similar study by Shuang-hu et al. (2012) yielded qualitatively similar results. These results are also consistent with Kandrack and Lundberg (2014), who ran a version of the dictator game in which the recipient was a charity; relative to those in a control treatment where a neutral mood was induced, subjects in an induced sad mood gave more money away (although the difference was only significant at the 10% level); a similar manipulation by Ibanez et al. (2016) found no effect. In contrast, Capra (2004) found subjects in an induced good mood were less selfish in the dictator game than those in a bad mood, but the sample was small and the result only significant at the 10% level.

However, mood-inducement experiments using different economic games have had a greater tendency to find happiness makes subjects less selfish. Kirchsteiger et al. (2006) found second movers in the gift-exchange game were more generous, controlling for the behaviour of the first mover, when induced into positive moods than into negative moods. Capra et al. (2010) found subjects induced into a good mood tended to overbid in an auction setting relative to those induced into a neutral mood. Hertel et al. (2000) found inducing a good mood led to less free-riding in a subsequent public goods game than inducing a bad mood, although only when a social norm of cooperativeness was presented to participants. In another public goods game, Drouvelis and Grosskopf (2016) found subjects with induced happiness contributed more than subjects with induced anger.⁶ Hertel and Fiedler (1994), meanwhile, found no significant overall effect of mood-inducement on free riding in a social dilemma, only that the extent of free riding varied more amongst happy subjects than amongst unhappy subjects.

⁴ A recent study by Diego-Rosell et al. (2016), again using international Gallup World Poll data, also estimated a positive correlation between self-reported altruistic behaviour and SWB, but the effect was of a much smaller magnitude than found in Aknin et al. (2013a). In this case the altruism was constructed as an index, based on self-reported volunteering and frequency of helping strangers, in addition to charitable giving.

⁵ While not strictly related to one's own selfishness, it is interesting to note that an inverse relationship also exists between happiness and one's tolerance for dishonesty. This has been found by several cross-sectional studies which correlate SWB with respondents' reported tolerance for such types of behaviour as corruption, tax fraud and fare-dodging (e.g. Helliwell, 2003; de Jesus Garcia et al., 2007; James, 2011; Lubian and Zarri, 2011). However, an interesting study by Stavrova et al. (2013) suggests that the inverse relationship between SWB and tolerance for dishonesty only exists in countries where virtuous behaviour is the norm.

⁶ As the comparison in this study is between subjects induced into happy and angry moods, it is uncertain whether the higher contribution rate is the result of greater happiness or lesser anger. Given that anger is likely to be a close correlate of unhappiness, it is at least suggestive of an effect of happiness.

It is therefore impossible to conclude what effect fluctuations in short-term happiness should be expected to have on selfish economic behaviour. The contrasting results between dictator games and the other types of economic experiment cited in this subsection suggest elements of the game-setting may determine the direction of the effect. Dictator games differ from the other experiments in that they are particularly simple environments, involving interaction with only one other person, who is passive.

Moreover, the effect of short-term happiness on selfishness may be very different from the effect of long-term happiness. The latter has rarely been investigated. [Konow and Earley \(2008\)](#) addressed the question by running a dictator game; instead of exogenously influencing moods beforehand, they elicited subjects' SWB relating both to the immediate present and to the state of their lives in general. Although dictators' long-term SWB correlated positively with their generosity, their immediate SWB did not, which suggested that greater happiness was not directly causing greater generosity. Instead, psychological wellbeing (defined as a set of psychologically healthy, or self-actualising, personality characteristics) emerged as a plausible determinant of both long-term SWB and generosity (however, their experiment was unable to test whether psychological wellbeing is itself boosted by generous behaviour). Their results were largely replicated by [Koch \(2015\)](#). Beyond the lab, the effect of long-term happiness on extreme generosity was tested by [Brethel-Haurwitz and Marsh \(2014\)](#): they found regional SWB levels predicted regional kidney donation rates, and argued that the extreme rarity of kidney donation meant reverse causality was unlikely.

3.3. Studies investigating the effect of selfishness on happiness

[Dunn et al. \(2008\)](#) measured the SWB of employees before receiving a bonus and again two months later. The way employees spent the bonus affected their SWB at the second measurement, with those spending generously (on others and charity) experiencing the greatest improvement relative to the first measurement. To address the possibility of self-selection driving these results (see [Section 2](#)), the authors also ran an experiment where subjects were compelled to spend money either selfishly or generously; the improvement in SWB was found to be greater for those forced to spend generously. Interestingly, the authors found evidence of affective forecasting errors: a further set of impartial participants incorrectly guessed that the subjects assigned to be selfish would be made happier than the subjects assigned to be generous.

In a similar experiment [Geenen et al. \(2014\)](#) replicated the finding that subjects assigned to spend money generously experienced a greater happiness gain than those assigned to spend it selfishly, with the additional discovery that this held true whether the money was received as a windfall or as payment for effort in a task. In further related experiments, [Aknin et al. \(2013a, 2015\)](#) confirmed the effect held true across divergent cultures: amongst subject pools in Canada, South Africa and Vanuatu, being assigned to buy goods for others always tended to boost SWB more than being assigned to buy them for oneself.⁷ [Aknin et al. \(2012, 2015\)](#) also found the effect in toddlers in Canada and Vanuatu: being assigned to give away treats made them happier than being assigned to keep them (according to their facial expressions as judged by observers blind to the experimental hypotheses).

As mentioned in [Section 2](#), subjects assigned to behave in a particular way may not experience the full hedonic impact of their actions that they would have if they had carried them out by choice.

⁷ In [Aknin et al. \(2013a\)](#), they also primed subjects in Canada, Uganda and India to remember recent instances in which they had spent money either on themselves or on others, and then elicited their happiness; in both countries, greater happiness was elicited amongst those recalling generous actions.

In the case of this group of experiments, this is not a good reason to question their finding of a positive effect of generosity on happiness. One would expect generous individuals to experience less warm glow when the generosity is forced,⁸ and selfish individuals to experience less guilt when the selfishness is forced, so the result that generosity causes happiness is more likely to be in spite of the assignment method rather than because of it.

While the aforementioned experiments have demonstrated a negative effect of selfishness on happiness, rather more mixed evidence is provided by dictator games which elicit subjects' happiness immediately before and after making distributive decisions. [Dunn et al. \(2010a\)](#) did find the negative effect of selfishness on happiness: relative to generous players, selfish dictators experienced a negative mood change; they also reported feeling more shame and experienced raised cortisol (i.e. stress) levels. [Aknin et al. \(2013a,b\)](#) also found the effect, although only under qualified circumstances: generous dictators experienced a happiness gain relative to selfish dictators, but only when they personally interacted with their recipient.⁹ A qualified effect was likewise found by [Bischoff and Krauskopf \(2015\)](#): in a dictator game with the recipient a charity, generosity positively predicted subjects' improvement in happiness, but only when distributive decisions were made individually rather than in groups.

On the other hand, [Konow and Earley \(2008\)](#) and [Koch \(2015\)](#) found players experienced similar levels of mood-improvement whether they acted selfishly or generously. [Konow \(2010\)](#) found selfish dictators experienced greater mood-improvement than generous dictators when the recipient was a student, while the reverse was the case when the recipient was a charity. Taking a slightly different approach, [Berman and Small \(2012\)](#) asked subjects to report their enjoyment from playing a dictator game; they found no significant difference between the reported enjoyment of those who kept the endowment versus those who gave it to charity. Although these four studies do not support a causal effect of generosity on happiness, only one result of [Konow \(2010\)](#) directly refutes it. The rest of the results are inconclusive, and such null findings on the effect of behaviour on mood can be the result of self-selection (see [Section 2](#)).

However, the latter four studies ([Konow and Earley, 2008](#); [Konow, 2010](#); [Berman and Small, 2012](#); [Koch, 2015](#)) all yield a further interesting insight. Additional treatments where the dictators were forced to behave selfishly led to higher levels of mood-improvement than were experienced by dictators who chose either to be selfish or generous in the regular game. This suggests there is a hedonic cost from having to choose between selfish and generous behaviour, which [Berman and Small \(2012\)](#) demonstrated was not the result of having to make a choice in general. This finding may be reconciled with the overall positive relationship between generosity and happiness on the basis that in ordinary life people rarely face situations where selfishness is the only option.

Overall, then, the balance of experimental evidence supports the argument that financial generosity leads to increased hap-

⁸ In fact, this is empirically supported by [Harbaugh et al. \(2007\)](#), who found subjects reported greater happiness from allocating money to charity by choice than by command, with the difference also reflected in the levels of neural activity in reward centres of subjects' brains. On the other hand, [Berman and Small \(2012\)](#) found no difference in happiness between those who voluntarily gave to charity and those who were forced to do so.

⁹ Other experiments reported in [Aknin et al. \(2013b\)](#) found the same effect regarding generosity towards friends and charity: it only raised happiness when the giver personally interacted with the recipient or someone closely connected to them. This suggests the positive effect of generosity on happiness may depend partly on its effect on social relationships. It supports earlier evidence from [Aknin et al. \(2011\)](#), who found subjects assigned to remember a time they had spent money on a strong social relationship experienced greater happiness than others assigned to remember spending money on weak social relationships.

piness. Experiments have also uncovered evidence of a positive causal effect on happiness of generosity in terms of one's time and effort. Instructing, or nudging, subjects to perform regular acts of kindness over a period of days (Buchanan and Bardi, 2010) or weeks (Lyubomirsky et al., 2005; Layous et al., 2016; Nelson et al., 2016) has been shown to increase their SWB, relative to that of control subjects.

So far the evidence presented in this section relates to the effect of selfishness on happiness in the short term (at the longest, Dunn et al., 2008, consider a two-month time-period). However, a few studies using survey data have proposed a negative causal effect of selfish behaviour on happiness in the long term. Exploiting the natural experiment of German reunification, Meier and Stutzer (2008) discovered that East Germans who, due to societal restructuring, lost the opportunity to volunteer suffered a decline in their SWB. Another approach has been to use panel regressions with lagged independent variables. Employing such methods, Van Willingen (2000), Choi and Kim (2011) and Kahana et al. (2013) all found past levels of volunteering predicted present happiness; Choi and Kim (2011) also found past levels of charitable giving predicted present happiness. Meanwhile, Borgonovi (2008) used religious fragmentation within the US as an instrumental variable to show (religious) volunteering had a positive causal impact on long-term happiness.

3.4. Studies finding bi-causality between selfishness and happiness

Two studies have found selfishness and happiness to be mutually dependent. Thoits and Hewitt (2001) found past levels of volunteering positively predicted present happiness, while past levels of happiness also positively predicted present levels of volunteering. Boenigk and Mayr (2015) performed Cohen's Path Analysis on German social survey data, and concluded that happiness and charitable giving each positively influenced the other. Their methodology allowed them to compare which direction of causality was stronger, and their finding was that happiness had the dominant causal effect on generosity. This contrasts to the bulk of the evidence surveyed above, wherein a positive effect of generosity on happiness has often been found while inconclusive findings have been made regarding the effect of happiness on generosity. Note, however, that most of the evidence surveyed refers to short-term happiness, while Boenigk and Mayr (2015) consider happiness in the long term.

Conclusion 1. *There is clear evidence of a negative relationship between happiness and selfishness. Regarding the direction of causality, selfishness appears to cause greater unhappiness in the short term, and there is growing evidence that this also holds in the long term. The causal effect of happiness on selfishness is less clear: evidence on the effect of short-term happiness on selfishness is mixed, but there is moderate evidence of a negative effect of long-term SWB and psychological wellbeing on selfishness. The literature is summarised in Table 1.*

4. The relationship between happiness and trust

This section addresses the relationship between happiness and trust. Strictly speaking, trust is not a behaviour but a belief 'in the reliability, truth, or ability of someone or something' (Oxford Dictionaries, 2016). Nevertheless, it is reasonably assumed that from this belief follows trusting behaviour, wherein individuals invest time, money or effort on endeavours which depend on the assistance of those they trust. Therefore, while the trusting behaviour elicited by the experimental trust game is different from the trust

elicited in social surveys, it is expected that the former is the consequence of the latter.¹⁰

4.1. Correlational studies

An established finding in the happiness literature is that an individual's long-term SWB positively correlates with their level of generalised trust – that is, the extent to which they believe people in general can be trusted.¹¹ This relationship has been found in the analysis of data from the World Values Survey (Bjornskov, 2003; Helliwell, 2003; Bjornskov, 2006; Tov and Diener, 2009; Elgar et al., 2011; Churchill and Mishra, 2016), the Gallup World Poll (Helliwell and Wang, 2011), the European Values Study (Klein, 2013), the European Social Survey (Portela et al., 2013; Helliwell et al., 2014; Rodriguez-Pose and von Berlepsch, 2014), social surveys in the US (Brehm and Rahn, 1997), Japan (Matsushima and Matsunaga, 2015; Yamamura et al., 2015; Kanai, 2016; Oshio, 2016), China (Yip et al., 2007), Taiwan (Chang, 2009), Thailand (Rukumnuaykit and Pholphirul, 2016), Spain (Pena-Lopez et al., 2016), Serbia (Jovanovic, 2016), Italy (Zanin, 2016) and Ghana (Sulemana, 2015b), and a survey of American high school seniors (Rahn and Transue, 1998). Using Eurobarometer data, Hudson (2006) also found positive correlations between SWB and trust in such institutions as governments, central banks, police, big business, the UN and the law. Several subsequent studies have also found trust in institutions to be positively associated with happiness (Helliwell and Wang, 2011; Klein, 2013; Portela et al., 2013; Helliwell et al., 2014; Rodriguez-Pose and von Berlepsch, 2014; Sulemana, 2015b).¹²

4.2. Studies investigating the effect of happiness on trust

Two experiments have used mood-inducement to investigate the causal effect of short-term happiness on the behaviour of first movers in the trust game. Mislin et al. (2015) found that happier participants were more trusting than those in a neutral mood. However, this was only the case in one condition, where the potential gains from trusting were low; they did not behave significantly differently in the other condition where the potential gains from trusting were high. Capra (2004), meanwhile, found no difference in the behaviour of happy and sad first movers, although the experiment had a small sample.

Two further experiments have used mood-inducement in order to measure the causal effect of short-term happiness on subjects' self-reported levels of trust. Dunn and Schweitzer (2005) found participants in a happy mood reported feeling higher levels of trust

¹⁰ Trusting behaviour, as defined in this paper, is conceptually different from generosity. Trust has potential material rewards for oneself, if those one trusts turn out to be trustworthy, whereas the material rewards of generosity only accrue to others. Decomposing trusting behaviour is tricky, however. Generosity can be one motivation behind it; one's preference over risk can be another. This paper reviews trust in isolation from these other behavioural tendencies because it is generally treated as a distinct topic within the literature.

¹¹ The standard question for eliciting generalised trust, used by the World Values Survey, the European Values Study, the European Social Survey and the US General Social Survey, is: 'Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people?' Note that the interpretation of 'can be trusted' is left up to the respondent. Some surveys build a trust index from multiple items, which include the question of whether people can be trusted in general as well as more specific questions – for instance, one question in the Taiwanese Survey of Social Development Trends used by Chang (2009) is 'Do you think that most people would try to take advantage of you if they got a chance?'

¹² To measure trust in institutions, Eurobarometer asks: 'For each of the following institutions, please tell me if you tend to trust it or tend not to trust it.' Other studies use very similar methodology. As with generalised trust, the surveys do not define the meaning of 'trust' to respondents.

Table 1
Summary of the relationship between happiness and selfishness.

Correlation between happiness and selfishness		
Topic	Result found	Studies
Correlation (short term)	Negative correlation	Bolle et al. (2014); Joffily et al. (2014)
Correlation (short term) Correlation (long term)	No correlation Negative correlation	Charness and Grosskopf (2001) Aknin et al. (2013a); Ambrey and Daniels (2016); Becchetti et al. (2016); Binder (2015); Binder and Blankenburg (2016); Binder and Freytag (2013); Borman et al. (2001); Brown et al. (2012); Brown and Kasser (2005); Corral-Verdugo et al. (2011); Choi (2016); Diego-Rosell et al. (2016); Dunn et al. (2008); Dulin et al. (2012); Ferrer-i-Carbonell and Gërkhani (2016); Gimenez-Nadal and Molina (2015); Jacob et al. (2009); Jiang et al. (2016); Kaida and Kaida (2015); Koch (2015); Konow and Earley (2008); Matsushima and Matsunaga (2015); McMunn et al. (2009); Mellor et al. (2008); Oarga et al. (2015); Okun et al. (2011); Organ and Ryan (1995); Phelps (2001); Pholpirul (2015); Pilkington et al. (2012); Pulcu et al. (2015); Suarez-Varela et al. (2014); Sulemana (2015a); Taghian et al. (2012); Tanskanen and Danielsbacka (2016); Tiwari (2016); Tov and Diener (2009); Wheeler et al., (1998); Windsor et al. (2008); Xiao and Li (2011)
Correlation (long term) Effect of happiness on selfishness Effect of happiness on selfishness (short term)	No correlation Negative effect No effect Positive effect	Charness and Grosskopf (2001) Drouvelis and Grosskopf (2016); Hertel et al. (2000); Kirchsteiger et al. (2006); Capra (2004); Capra et al. (2010) Hertel and Fiedler (1994); Ibanez et al. (2016) Shuang-hu et al. (2012); Tan and Forgas (2010); Kandrack and Lundberg (2014)
Effect of happiness on selfishness (long term)	Negative effect No effect	Brethel-Haurwitz and Marsh (2014); Thoits and Hewitt (2001); Boenigk and Mayr (2015) Koch (2015); Konow and Earley (2008)
Effect of selfishness on happiness Effect of selfishness on happiness (short term)	Negative effect No effect Positive effect Negative effect	Aknin et al. (2012, 2013a,b, 2014, 2015); Bischoff and Krauskopf (2015); Buchanan and Bardi (2010); Dunn et al. (2008, 2010a); Geenen et al. (2014); Konow (2010); Layous et al. (2016); Lyubomirsky et al. (2005); Nelson et al. (2016) Berman and Small (2012); Koch (2015); Konow and Earley (2008) Konow (2010)
Effect of selfishness on happiness (long term)	No effect Positive effect Negative effect	Boenigk and Mayr (2015); Borgonovi (2008); Choi and Kim (2011); Kahana et al. (2013); Meier and Stutzer (2008); Thoits and Hewitt (2001); Van Willigen (2000)

towards specific acquaintances than did those in a sad mood, although this depended on the method used to induce emotions: merely asking subjects to remember happy or sad events did not lead to treatment differences, but asking them to write about them did. [Lei and Lu \(2014\)](#) found no significant effect of inducing positive mood on the levels of trust Chinese subjects reported feeling towards politicians.

There is, therefore, tentative evidence that trust flows from short-term positive fluctuations in happiness. The causal effect of long-term happiness on trust is less clear. [Koch \(2015\)](#) found that the decision to trust in a sequential prisoner's dilemma was positively predicted by long-run SWB, but was unrelated to short-run SWB immediately before playing the game; a causal effect of SWB on trusting behaviour was therefore unlikely. As with his and [Konow and Earley's \(2008\)](#) research on generosity, a plausible interpretation of [Koch's \(2015\)](#) results was that long-term SWB and trusting behaviour were both determined by psychological wellbeing (whether psychological wellbeing itself is underpinned by trust could not be tested).

[Mellick \(2014\)](#) ran a trust game where the first movers were teenaged girls suffering from depression – a group of people known to have very low levels of SWB in the long term. They found the depressed subjects were in fact more trusting than a healthy control group. Moreover, the subjects with severe depression were more trusting than those with milder forms. Another experiment by [Unoka et al. \(2009\)](#), which used a procedurally similar trust game, found no significant difference in trusting be-

haviour between depressed and healthy adults. Nevertheless, while reverse causality cannot be ruled out (see [Section 2](#)), the finding of [Mellick \(2014\)](#) could be interpreted as implying a negative effect of long-term happiness on trusting behaviour. Another explanation could be that depression is a special case – that depressed individuals behave differently from those who are healthy but unhappy.

4.3. Studies investigating the effect of trust on happiness

Two studies analysing social survey data ([Bjornskov, 2008](#); [Kuroki, 2011](#)), have used instrumental variables to demonstrate a positive causal effect of trust on long-term happiness. There is also evidence from two experiments of a positive causal effect of trusting behaviour on short-term happiness. [Becchetti and Degli Antoni \(2010\)](#) measured the SWB of senders either before or after playing a trust game. For those whose SWB was elicited before the game no correlation was found between SWB and the decision to trust, but amongst those who had it elicited afterwards SWB was higher for those who chose to trust. The results suggest that trustors experienced a happiness gain from the experiment relative to non-trustors, and this could not be explained by differences in financial payoffs from the game. Consistent with this, [Koch \(2015\)](#), who measured the short-term SWB of all senders before and after playing the trust game, found non-trustors experienced mood-deterioration while the mood of trustors remained unchanged. Although it is impossible to rule out self-selection driving the experimental results (see [Section 2](#)), the findings of these studies are

Table 2
Summary of the relationship between happiness and trust.

Correlation between happiness and trust		
Topic	Result found	Studies
Correlation (long term)	Positive correlation	Bjornskov (2003, 2006); Brehm and Rahn (1997); Chang (2009); Churchill and Mishra (2016); Elgar et al. (2011); Helliwell (2003); Helliwell and Wang (2011); Helliwell et al. (2014); Hudson (2006); Jovanovic (2016); Kanai (2016); Klein (2013); Matsushima and Matsunaga (2015); Oshio (2016); Pena-Lopez et al. (2016); Portela et al. (2013); Rahn and Transue (1998); Rodriguez-Pose and von Berlepsch (2014); Rukumnuaykit and Pholphirul (2016); Sulemana (2015b); Tov and Diener (2009); Yamamura et al. (2015); Yip et al. (2007); Zanin (2016)
	No correlation	Unoka et al. (2009)
	Negative correlation	Mellick (2014)
Effect of happiness on trust		
Effect of happiness on trust (short term)	Positive effect	Dunn and Schweitzer(2005); Mislin et al. (2015)
	No effect	Capra(2004); Lei and Lu (2014)
Effect of happiness on trust (long term)	No effect	Koch (2015)
Effect of trust on happiness		
Effect of trust on happiness (short term)	Positive effect	Becchetti and Degli Antoni (2010); Koch (2015)
Effect of trust on happiness (long term)	Positive effect	Bjornskov (2008); Kuroki (2011)

collectively suggestive of a causal relationship running from trust-ing behaviour to happiness in both the short and long term.

Conclusion 2. *There is clear evidence of a positive relationship between happiness and trust. The evidence that trust causes happiness is stronger than the converse. Two experiments suggest trust has a positive causal effect on short-term happiness; two non-experimental studies also identify a positive causal effect of trust on long-term happiness. The causal effect of short-term happiness on trust is found to be either positive or null; the effect of long-term happiness on trust is unclear. The literature is summarised in Table 2.*

5. The relationship between happiness and reciprocity

This section addresses how happiness relates to one's tendency to engage in reciprocal behaviour. I separately consider negative reciprocity, the act of punishing others for behaviour which has harmed oneself, and positive reciprocity, the act of rewarding others for behaviour which has benefited oneself. In all cases the act of punishing or rewarding is at a material cost to the protagonist.¹³

5.1. Studies investigating the short-term effect of happiness on reciprocity

The evidence from several mood-inducement studies reveals a clear consensus that unhappiness, in the short term, makes people more willing to engage in negative reciprocity through the use of costly punishment. This has been repeatedly demonstrated in ultimatum games. Forgas and Tan (2013) found responders in

sad moods were more likely than those in happy moods to punish unfair offers by rejecting them. Harle and Sanfey (2007), and Liu et al. (2016), found rejection rates for unfair offers were higher for responders in sad moods than for those in neutral moods, while Riepl et al. (2016) found they were lower for responders in happy moods than for those in neutral moods, and Andrade and Ariely (2009) found they were lower for responders in happy moods than for those in angry moods. In the public goods game, meanwhile, Drouvelis and Grosskopf (2016) found inducing happiness led to lower punishment levels than inducing anger.^{14 15}

Two studies have demonstrated plausible neural explanations for the causal effect of unhappiness on the willingness to engage in negative reciprocity. Harle et al. (2012), who replicated the finding that ultimatum game respondents in induced sad moods punished more than those in neutral moods, showed that unfair offers triggered greater activity in the anterior insula and anterior cingulate cortex – brain sections associated with aversive emotional states and cognitive conflict – for sad respondents, and greater activity in the ventral striatum – associated with reward processing – for respondents who were not sad. Crockett et al. (2013), who manipulated serotonin levels in participants before playing the ultimatum game, found those with depleted serotonin (i.e. lower happiness)

¹⁴ As the studies by Andrade and Ariely (2009) and Drouvelis and Grosskopf (2016) compare behaviour between those with induced happiness and those with induced anger, it is uncertain whether the stronger negative reciprocity is caused by lower happiness or greater anger. Given that anger is likely to be a close correlate of unhappiness, the studies are at least suggestive of an effect of happiness, particularly as this would be consistent with the results of the other studies listed in this paragraph, which do not induce anger but find an effect of happiness.

¹⁵ Experiments by Bosman and van Winden (2002), Ben-Shakhar et al. (2007), Hopfensitz and Reuben (2009) and Hennig-Schmidt et al. (2016) also investigate whether happiness predicts negative reciprocity, although drawing causal inference from these studies is not possible. Hopfensitz and Reuben (2009) and Hennig-Schmidt et al. (2016) find a negative relationship between happiness and negative reciprocity, while Bosman and van Winden (2002) and Ben-Shakhar et al. (2007) return null results.

¹³ Another related behaviour is third-party punishment, the act of punishing others for behaviour which has harmed third parties but not oneself. There has been scarce research on the relationship between third-party punishment and happiness, and so far it has not yielded significant results. Crockett et al. (2013) found depleting participants' serotonin levels had no significant effect on third-party punishment in a dictator game; Koch (2015) did not identify strong correlations between SWB and punishment in either of two third-party punishment games.

had greater activity in the dorsal striatum and were correspondingly more likely to reject unfair offers.¹⁶

It is unclear whether the short-term effect of happiness on negative reciprocity generalises to positive reciprocity. What little evidence exists suggests it does not. [Kirchsteiger et al. \(2006\)](#) found that second movers in the gift-exchange game who had been induced into a bad mood, while tending to be more generous, were relatively non-reciprocal. That is, they conditioned their moves on the basis of the first movers' behaviour to a lesser extent than did second movers who had been induced into a good mood.

5.2. Studies investigating the short-term effect of reciprocity on happiness

There is some evidence that engaging in negative reciprocity by inflicting punishment, and even having available the option to do so, can bring individuals happiness. [Brandts and Rivas \(2009\)](#) ran a public goods experiment where the rules of the game allowed either no punishment, weak punishment or harsh punishment of free-riders. SWB was measured after the experiment. After controlling for material payoffs and the extent to which they used punishment, subjects were found to be happiest in the setting with harsh punishment available. Although it did not fully explain the benefits of the availability of punishment, an individual's use of punishment was also found to predict their SWB. While reverse causality – that happier subjects punished more – is possible, this would be inconsistent with the evidence above that short-term happiness tends to lead to lesser negative reciprocity.

A plausible neural mechanism by which negative reciprocity can lead to happiness was presented by [De Quervain et al. \(2004\)](#). They ran a trust game in which the sender had the option to punish the recipient for defecting, and found activation of the sender's dorsal striatum – a brain reward centre – was correlated to the amount they spent on punishment, and also was stronger when punishment materially harmed the recipient than when it was merely symbolic.

Some weaker evidence on a positive effect of negative reciprocity on happiness comes from [Pfister and Bohm \(2012\)](#). Ultimatum game responders who rejected offers experienced an improvement in their reported satisfaction from making their decision, while responders who accepted offers did not. This does not show, however, that rejecting unfair offers should in general maximise one's happiness, as subjects who were initially most unhappy as a result of receiving the unfair offer may have self-selected into rejecting it.

There is also evidence that positive reciprocity may be a source of happiness. In [Koch \(2015\)](#), second movers in the trust game who did not reward the trustor experienced deterioration in their moods, whereas those who acted trustworthily experienced a small improvement (although, as discussed in [Section 2](#), self-selection could drive this result). In another trust game experiment, [Becchetti and Degli Antoni \(2010\)](#) found no effect of second movers' trustworthiness on their mood change.

5.3. Studies investigating the long-term relationship between happiness and reciprocity

The long-term relationships between happiness and reciprocity, both positive and negative, are unclear, although several relevant studies exist. The direction of causality assumed in all cases is of

long-term happiness on behaviour, although empirically none can rule out reverse causality.

Regarding negative reciprocity, [Koch \(2015\)](#) found a negative relationship between long-term SWB (according to some measures) and the rejection of unfair ultimatum game offers. [Dunn et al. \(2010b\)](#) found the reverse: subjects with higher long-term SWB were more likely to reject unfair offers. [Riepl et al. \(2016\)](#), however, found no significant association between long-term SWB and rejection behaviour. Further studies have used clinically depressed subjects. [Harle et al. \(2010\)](#) found that depressed individuals were more willing to accept unfair offers than healthy control subjects, but similar experiments by [Destoop et al. \(2012\)](#) and [Gradin et al. \(2015\)](#) found no significant relationship between depression and rejection behaviour. Both [McClure et al. \(2007\)](#) and [Sorgi and van't Wout \(2016\)](#) also found negative reciprocity not to significantly differ between healthy and depressed players in repeated prisoner's dilemmas. In summary, then, two studies found long-term happiness was negatively correlated with punishment, one study found they were positively correlated, and five found no significant relationship. If these studies are correct in assuming they are measuring the causal effects of happiness on negative reciprocity, then the probable conclusion is that the well-established negative effect of happiness on negative reciprocity in the short term does not hold in the long term. However, if there is some reverse causality, the short- and long-term effects of happiness on negative reciprocity may not be at odds, given the evidence that negative reciprocity raises happiness in the short term. That is, the absence of a long-term correlation between happiness and negative reciprocity could be the result of a negative feedback loop between the two.

Evidence from research on depression suggests a negative relationship between long-term happiness and positive reciprocity. In repeated prisoner's dilemmas, [McClure et al. \(2007\)](#) and [Sorgi and van't Wout \(2016\)](#) found that depressed individuals were more likely than healthy individuals to engage in positive reciprocity. The same was found for behaviour in the trust game by [Caceda et al. \(2014\)](#) and [Ong et al. \(2016\)](#), although in the former study only for males and not for females. These are the opposite effects to those identified between short-term happiness and positive reciprocity in the previous two subsections. One possible explanation for the disparity is that the long-term relationships truly differ from the short-term; another is that the behaviour of depressed people does not generalise to that of unhappy but healthy individuals.

Conclusion 3. *Short-term unhappiness leads to greater negative reciprocity. Conversely, however, engaging in negative reciprocity appears to increase one's short-term happiness. The relationship between long-term happiness and the use of negative reciprocity is unclear. There is some evidence of a bi-causal positive relationship between short-term happiness and the use of positive reciprocity; evidence, however, suggests a negative relationship between long-term happiness and positive reciprocity. The literature is summarised in [Table 3](#).*

6. The relationship between happiness and risk preferences

This section considers the relationship between happiness and risk preferences, i.e. the extent to which one favours actions with uncertain outcomes over actions with certain outcomes. Despite a large body of research attempting to answer the question, the relationship between happiness and risk preferences is distinctly unclear. The great majority of studies on the topic seek to identify causal effects of short-term happiness on risk preferences, and in this literature there compete two opposing psychological theories. The Affect Infusion Model (AIM) ([Forgas, 1995](#)) proposes that positive moods lead to relatively risk-seeking behaviour, while the

¹⁶ The authors concluded the stronger negative reciprocity by those with depleted serotonin was driven by a differential in the desire for retaliation rather than in the perception of how fair a given offer was, as serotonin levels did not predict fairness ratings subjects attributed to offers.

Table 3
Summary of the relationship between happiness and reciprocity.

Relationship between happiness and negative reciprocity		
Topic	Result found	Studies
Correlation (short term)	Positive correlation	Brandts and Rivas (2009)
	No correlation	Bosman and van Winden (2002); Ben-Shakhar et al. (2007)
	Negative correlation	Hopfensitz and Reuben (2009); Hennig-Schmidt et al. (2016)
Correlation (long term)	Negative correlation	Koch (2015)
	No correlation	Destoop et al. (2012); Gradin et al. (2015); McClure et al. (2007); Riepl et al. (2016)
	Positive correlation	Dunn et al., (2010b); Harle et al. (2010)
Effect of happiness on negative reciprocity (short term)	Negative effect	Andrade and Ariely (2009); Crockett et al. (2013); Drouvelis and Grosskopf (2016); Forgas and Tan (2013); Liu et al. (2016); Harle et al. (2012); Harle and Sanfey (2007); Riepl et al. (2016)
Effect of negative reciprocity on happiness (short term)	Positive effect	De Quervain et al. (2004); Pfister and Bohm (2012)
Relationship between happiness and positive reciprocity		
Topic	Result found	Studies
Correlation (long term)	Negative correlation	Caceda et al. (2014); McClure et al. (2007); Ong et al. (2016); Sorgi and van't Wout (2016)
	Positive effect	Kirchsteiger et al. (2006)
Effect of happiness on positive reciprocity (short term)	Positive effect	Koch (2015)
Effect of positive reciprocity on happiness (short term)	No effect	Becchetti and Degli Antoni (2010)

Mood Maintenance Hypothesis (MMH) (Isen and Patrick, 1983) suggests positive moods result in relatively risk-averse behaviour. Both theories enjoy the empirical support of numerous studies of different types.

Earlier literature in this area consisted mostly of experiments which induced moods in subjects before asking them to make hypothetical decisions involving risk. Such studies to have found support for AIM include Isen and Patrick (1983), Deldin and Levin (1986), Yuen and Lee (2003), Chou et al. (2007) and Hu et al. (2015); those finding evidence in favour of MMH include Mittal and Ross (1998), Raghunathan and Pham (1999) and Lin et al. (2006b). One study, Arkes et al. (1988), found conflicting evidence: the results of a hypothetical lottery supported AIM, while preferences over hypothetical loss-insurance were consistent with MMH. Support for AIM was also obtained by two slightly different, but still hypothetical, experiments: Heilman et al. (2010), which exploited naturally occurring mood resulting from a recent exam, and Grable and Roszkowski (2008), who asked survey-respondents to report their current mood rather than exogenously influencing it (thus making causal identification more contentious).

Evidence now also exists from several experiments employing mood-inducement and materially-incentivised risky-choice tasks. Of these, Nygren et al. (1996) and Yechiam et al. (2016) found support for MMH, while Isen and Patrick (1983) found support for the MMH when stakes were relatively high, but for AIM when they were relatively low. Four recent papers (Schulreich et al., 2013; Campos-Vazquez and Cuijly, 2014; Stanton et al., 2014; Treffers et al., 2016) offer evidence in favour of AIM. Two others (Fehr-Duda et al., 2011; Drichoutis and Nayga, 2013) do not favour one theory over the other.

The effect of short-term happiness on risk preferences has also been pursued by non-experimental studies. These have exploited exogenous variations in weather, taking advantage of its known effect on mood. Kliger and Levy (2003) extracted risk preferences from capital market data to show investors became more risk-averse in good weather (i.e. in good mood). A similar approach

was taken by Guven and Hoxha (2015), who demonstrated that greater amounts of sunshine on the day respondents filled out Dutch and German social surveys led to greater self-reported risk-aversion in financial and life choices. While the latter two studies provide support for MMH, evidence in favour of AIM comes from Kamstra et al. (2003), who used capital market data and seasonal variation in daylight hours to show bad moods led to a lower demand for risky assets, and from Otto et al. (2016) who used local weather and sports results to show good mood increased recreational gambling in New York City. A different approach from Sarno et al. (2016) also yielded results in favour of AIM; in a diary study, they found subjects were more likely to engage in risky sexual behaviour when they were in a better mood. Using face-reading software, Kahyaoglu and Ican (2016) suggested that relatively risky decision-making on *Deal or No Deal* was associated with greater happiness; this would be consistent with AIM, although drawing causal inference from this study is problematic.

The evidence, therefore, is conflicting, even if support has been found slightly more often for AIM. A partial explanation for the lack of consistency may come from the different methodologies used by different studies. While the evidence from hypothetical experiments is very mixed, from incentivised experiments it is rather in favour of AIM, based on the four recent studies (Schulreich et al., 2013; Campos-Vazquez and Cuijly, 2014; Stanton et al., 2014; Treffers et al., 2016) which support it. Moreover, the older incentivised experiments with results supporting MMH (Isen and Patrick, 1983; Nygren et al., 1996) were incentivised not with money but course credits, which subjects may have doubted they would really lose (indeed, the experiments used deception and subjects could not really lose credits). Given the importance economists attach to the use of credible incentives in generating experimental results, the evidence from experiments provides greater support for AIM than MMH. However, incentives cannot fully explain the inconsistencies, as there is support for MMH from one experiment using monetary incentives (Yechiam et al., 2016), as well as some field studies.

Inconsistencies do not appear to be over whether risk is measured in a financial or non-financial context: support for both AIM and MMH has been found in both cases (for both hypothetical and real decisions). However, another possibility is that differences in the nature of the positive or negative emotions felt by individuals can lead to differences in their risk preferences. Studies have found different types of bad moods can induce different behaviour; for instance, [Raghunathan and Pham \(1999\)](#) found inducing sadness made subjects more risk-seeking, but inducing anxiety made them more risk-averse. Although I have only considered studies which induce happy or sad emotions, there may still be subtle but important differences between studies in the precise moods these bring. A further complication could be that the effect of happiness on risk preferences may not be monotonic. For example, [Drichoutis and Nayga \(2013\)](#) found inducing either a positive or a negative mood increased risk-aversion, relative to a neutral-mood control group.

One consistent finding is that positive moods increase overconfidence – when people are in good moods, they tend to believe favourable events are more likely to take place. This has been found by several experiments which manipulate moods ([Johnson and Tversky, 1983](#); [Wright and Bower, 1992](#); [Nygren et al., 1996](#); [Fehr-Duda et al., 2011](#); [Schulreich et al., 2013](#)) or correlate confidence with mood within individuals over time ([Hogarth et al., 2011](#)). *Ceteris paribus*, overconfidence should lead to greater risk-taking, so the evidence that this does not always take place suggests positive moods induce other forces to mitigate the overconfidence, at least in some cases. One such force, although probably not the only one, could be loss aversion, which [Isen et al. \(1988\)](#) found to be increased by inducing positive moods in individuals.

A likely conclusion is that, while the sign for the effect of short-term happiness on risk preferences varies, in general the magnitude is close to zero. The effect sizes found in the literature tend to be small, and often significance is only found in one of a number of conditions. Publication bias may have kept more null results from being written up. The literature may be reaching the stage where a meta-analysis would be a useful endeavour.

Moreover, while the effect of short-term happiness on risk preferences has been thoroughly researched, it is not clear whether it would be correct to generalise any findings to the effect of long-term happiness. The relationship between long-term happiness and risk preferences has only been studied from a correlational perspective. [Delis and Mylonidis \(2015\)](#) took data from a Dutch social survey in which SWB and self-reported financial behaviour were elicited; happier people were found to be more risk-averse in their ownership of financial assets, but more risk-tolerant in their ownership of insurance. Meanwhile, research on adolescents has found those with higher SWB are less likely to engage in risky violent and/or illegal behaviour ([Valois et al., 2001](#)), and are also less likely to engage in risky sexual behaviour ([Valois et al., 2002](#)). On the other hand, [Martin et al. \(2002\)](#) found that children who were more cheerful grew up to be more risk-taking with regard to their health. Overall, then, the relationship between long-term happiness and risk preferences is also unclear.

Finally, an existing gap in the literature appears to be research on the causal effect of risky behaviour on happiness.

Conclusion 4. *The effect of short-term happiness on risk preferences is unclear. Short-term happiness increases overconfidence, but this does not consistently result in an increased appetite for risk. The effect of long-term happiness on risk preferences is also unclear, and the effect of risky behaviour on happiness has not been studied. The literature is summarised in Table 4.*

7. The relationship between happiness and time preferences

This section addresses the relationship between happiness and time preferences. I consider time discounting (the extent to which an individual prioritises immediate material consumption over future material consumption) and time consistency (the extent to which one succeeds in satisfying past preferences over present time discounting).

7.1. Studies investigating the effect of happiness on time preferences

Several studies have looked at the effect of short-term fluctuations in happiness on time discounting. From these, there is good evidence that positive moods result in greater patience towards monetary rewards. [Ifcher and Zarghamee \(2011\)](#), who induced positive and neutral moods in subjects and then asked them to choose between smaller-sooner and larger-later payoffs, found those in the positive mood had a greater preference to wait for the larger-later rewards. Implementing a similar setting but with hypothetical payoffs, [Pyone and Isen \(2011\)](#) found the same. Their study also provided a plausible explanation, with evidence that thoughts about the future loomed larger in the minds of subjects in positive moods. Two other similar experiments ([McLeish and Oxoby, 2007](#); [Drichoutis and Nayga, 2013](#)) yielded insignificant findings on the effect of positive mood on time discounting. However, the field study of [Güven and Hoxha \(2015\)](#) also found support for a positive effect of mood on patience; using weather as an instrument for mood, they found happier people reported being more patient and willing to prioritise the future over the present (this may partly have been due to the fact that happier people assigned themselves much longer life-expectancies).

While positive moods appear to increase patience, it is not quite clear that negative moods reduce it. This is supported by [Lerner et al. \(2012\)](#), who induced sad or neutral moods in participants, and found the sad individuals to be less patient over monetary rewards. The effect was driven by an increase in time-inconsistent present bias in the sad participants, rather than an increase in impatience generally. It is also partly supported by [McLeish and Oxoby \(2007\)](#); they found greater impatience amongst women in bad moods, although not amongst men. On the other hand, [Drichoutis and Nayga \(2013\)](#) found subjects who they had induced into negative moods were in fact more patient than those induced into neutral moods. However, this result was only significant at the 10% level. Overall, there is reasonably strong evidence of a positive effect of short-term happiness on patience; it would be natural to expect this effect to be monotonic, and there is certainly not compelling evidence against it being so.

To the author's knowledge, there is no specific evidence on the relationship between long-term happiness and time discounting.

7.2. Studies investigating the effect of time preferences on happiness

Although I am not aware of any research on the effect of time discounting on any type of happiness, something can be said about the effect of time inconsistency on happiness. Theoretically, there is a strong prediction: such a deviation from rationality ought to equate to a deviation from utility maximisation.¹⁷ Empirically, indirect evidence exists. [Frey et al. \(2007\)](#) and [Stutzer and Meier \(2016\)](#) have found happiness to be negatively related to two activities associated with self-control problems: watching TV and overeating. Although they only demonstrate correlation, they have theoretical arguments in favour of the activities – and, by

¹⁷ On the other hand, specific departures from rationality can theoretically raise utility if they help the individual overcome other pre-existing irrationalities (e.g. [Benabou and Tirole, 2005](#)).

Table 4
Summary of the relationship between happiness and risk-tolerance.

Correlation between happiness and risk-tolerance		
Topic	Result found	Studies
Correlation (short term)	Positive correlation	Grable and Roszkowski (2008); Kahyaoglu and Ican (2016)
Correlation (long term)	Positive correlation	Delis and Mylonidis (2015); Martin et al. (2002)
	Negative correlation	Delis and Mylonidis (2015); Valois et al. (2001, 2002)
Effect of happiness on risk-tolerance Effect of happiness on risk-tolerance(short term)	Positive effect (Affect Infusion Model)	Arkes et al. (1988); Campos-Vazquez and Cuilty (2014); Chou et al. (2007); Deldin and Levin (1986); Heilman et al. (2010); Hu et al., (2015); Isen and Patrick (1983); Kamstra et al. (2003); Otto et al. (2016); Schulreich et al. (2013); Sarno et al. (2016); Stanton et al. (2014); Treffers et al. (2016); Yuen and Lee (2003)
	No effect	Drichoutis and Nayga (2013); Fehr-Duda et al. (2011)
	Negative effect (Mood Maintenance Hypothesis)	Arkes et al. (1988); Guven and Hoxha (2015); Isen and Patrick (1983); Kliger and Levy (2003); Lin et al. (2006b); Mittal and Ross (1998); Nygren et al. (1996); Raghunathan and Pham (1999); Yechiam et al. (2016)

Table 5
Summary of the relationship between happiness and time preferences.

Relationship between happiness and patience		
Topic	Result found	Studies
Effect of happiness on patience (short term)	Positive effect	Guven and Hoxha (2015); Ifcher and Zarghamee (2011); Lerner et al. (2012); McLeish and Oxoby (2007); Pyone and Isen (2011)
	Negative effect	Drichoutis and Nayga (2013);
Relationship between happiness and time consistency	Result found	Studies
Effect of happiness on time consistency (short term)	Positive effect	Lerner et al. (2012)

extension, the time-inconsistency – causing unhappiness. Meanwhile, Gruber and Mullainathan (2006) showed smoking taxes increased the happiness of smokers relative to that of non-smokers. This finding is highly consistent with smoking – and the self-control problems associated with the activity – having a detrimental impact on happiness. Direct evidence on the effect of time-consistency on happiness would be difficult to obtain. In particular, it would be challenging to design a good experiment to this end, as it would not be straightforward to assign time-consistent or time-inconsistent behaviour amongst subjects.

Conclusion 5. *Short-term happiness appears to increase patience over monetary gains. The effect of long-term happiness on patience is unknown, as is the effect of patience on happiness. There is evidence that short-term unhappiness worsens time inconsistency, while indirect evidence suggests time inconsistency lowers happiness in the long term. The literature is summarised in Table 5.*

8. Conclusion and future research directions

This paper has reviewed the evidence linking happiness to interpersonal economic behaviour (selfishness, trust and reciprocity and punishment) and individual economic behaviour (risk and time preferences). A general finding is that happiness tends to result from pro-social behaviour. Generosity, trust and personally costly punishment – acts which boost society's cohesiveness – all raise happiness. Happiness can arguably be viewed as an evolutionary vehicle for allowing such socially productive behaviours to

flourish amongst humans (Grinde, 2005). From a practical perspective, it is good news for policymakers, who may find highlighting the hedonic effects of pro-social behaviour can help incentivise it (Dunn et al., 2008).

Many questions remain open in this literature. While the negative correlation between selfishness and happiness, and the negative causal effect of selfishness on happiness, are well established, the direction of the causal effect of happiness on selfishness – at least in the short term – remains uncertain. Likewise, there is a very clear positive relationship between trust and happiness, and growing evidence that trust causes happiness, but further research is required to establish the causal effect of happiness on trust, particularly in the long term.

There is good evidence of a negative effect of happiness on negative reciprocity, but a positive effect of negative reciprocity on happiness, in the short term; however, future research can resolve current uncertainty over whether these effects hold in the long term. How happiness relates to positive reciprocity (or to third-party punishment) is also currently not well understood, and an interesting further question – given the apparently positive hedonic effects of pro-social behaviour in general – would be to investigate separately how happiness relates to pro-social and anti-social punishment (Herrmann et al., 2008).

Research on the effect of short-term happiness on risk preferences continues to yield contradictory results, although recent evidence has tipped the balance slightly in favour of the Affect Infusion Model, which contends that good mood leads to risk-seeking behaviour. It may be that, on average, there is not a strong effect

in either direction; given the size of the literature, a meta-analysis could perhaps help provide an answer. Future research could further investigate the effects of long-term happiness on risk preferences. Moreover, a surprising omission is the existence of research on the effect of risky behaviour on happiness. Various questions remain unanswered regarding the relationship between happiness and time preferences. These include the effect of happiness on patience in the long term, the effects of patience on happiness, and the effects of happiness on time consistency.

In relation to economic behaviour in general, much more is known about the causes and effects of short-term happiness than of long-term happiness. The latter is much harder to investigate, but such findings as can be made are crucial in determining the external validity of claims based on short-term happiness. It is currently unclear whether, in general, we can expect relationships identified between economic behaviour and happiness in the short term to hold true in the long term. The causal effects on happiness of selfishness and trust appear to remain constant between the short and long term, but there are possible inconsistencies identified between the causal effects of short-term and long-term happiness on selfishness, trust, and positive and negative reciprocity.

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Tom Lane is a PhD student in Behavioural Economics at the University of Nottingham. Particular research interests include the experimental study of intergroup discrimination, social norms and their variation across cultures; and the study of subjective wellbeing. He is affiliated with the Centre for Decision Research and Experimental Economics (CeDEx), the Nottingham Interdisciplinary Centre for Economic and Political Research (NICEP) and the Network for Integrated Behavioural Science (NIBS).