Does misery love company? An experimental investigation

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Katherine Farrow,* Gilles Grolleau,† Lisette Ibanez‡

Abstract

The conventional wisdom summarized in the adage 'misery loves company,' suggests that suffering can be made easier to bear if it is also shared by others. Given increasing interest in subjective well-being and happiness as constituents of national wealth and priorities in policy-making and organizational management, we empirically investigate the validity of this phenomenon in order to explore whether it may be possible to mitigate decreases in subjective well-being simply by leveraging social comparison. We implement an experimental survey designed to gauge the suitability of this strategy on a representative sample of approximately 2000 U.S. residents. Our results indicate that, while this hypothesis is indeed borne out among certain populations within the sample, we find stronger and more widespread support for the opposite phenomenon, suggesting rather that 'happiness hates company.' These novel findings can inform policy interventions aiming to enhance well-being and point to promising avenues for further work.

Keywords: well-being, social norms, positional preferences, social information

JEL codes: C90; D03; D60; I31

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1 Introduction

Despite the global trend of rising standards of living, some groups may experience negative changes in quality of life due to random events such as environmental disasters or as a result of the process of economic development itself, which can involve an unequal distribution of benefits and in some cases even localized losses. Unexpected negative welfare shocks are also a regular occurrence in organizational contexts (e.g. failing to obtain grant funding or a promotion), as well as among consumers (e.g. overpaying for a service or unwittingly buying a defective product).

Recent developments in microeconomic theory have also given rise to new perspectives regarding the nature of utility and the policies that have historically been based on this concept.[1] The importance of a more holistic approach to understanding well-being is beginning to gain recognition among governments and international organizations. On a macroeconomic scale, for example, the appropriateness of gross domestic product as a measure of a national welfare has been called into question. In 2011, the United Nations unanimously adopted a resolution inviting countries to 'pursue the elaboration of additional measures that better capture the importance of the pursuit of happiness and well-being in development with a view to guiding their public policies' (UN General Assembly 2011). While this is an important step, integrating subjective well-being into policy considerations by extending the logic of social welfare optimization to happiness metrics may be too simplistic an approach. Frey and Stutzer (2010) notably warn of the incompatibility of the democratic process with the pursuit of happiness-maximization in the development of optimal policy. Instead, they contend that happiness research can serve

[1] Tversky and Griffin (1991) distinguish between two different measures of utility, namely experience value, which is generally measured by judgements regarding one's own well-being, and decision value, which is revealed through one's actual choices. They note that the difference between the two is rarely made explicit. They go on to demonstrate that in many cases judgements and choices yield systematically different preference orderings, and suggest that relying on either concept exclusively can therefore lead to suboptimal policy recommendations. More specifically, they show that whereas choice is predominantly determined by payoffs, judgements are predominantly determined by social comparison. Welfare policies derived from Pareto optimality (conceiving utility as decision value), for example, could conceivably make most people worse off in terms of subjective well-being by failing to take into account the social comparison effects that have been shown to be relevant to experience value.

an important role in informing the development of institutional processes that best enable citizens to exercise their individual sovereignty and express their preferences. As expressed by Kahneman (2018), rather than using measures of subjective well-being to maximize happiness, it may make more sense to focus instead on minimizing unhappiness: 'It may not be society's business to make people happier; but reducing suffering, that is something else... it's easier to measure misery than to measure happiness, and what we can do about it is clearer than what we can do to enhance happiness."

In this spirit, we empirically investigate whether people's subjective experience of a negative event be more tolerable if they know that the outcome is shared by a majority of others. We pursue this question notably in order to explore the potential for social comparison as a low-cost, low-risk policy tool to mitigate decreases in subjective well-being in the short term. If proven effective, such a tool would be applicable in instances of negative shocks to quality of life, whether unavoidable (e.g. natural disasters) or deliberate (e.g. layoffs, shocks entailed by taxation policies, etc.).

Experimental explorations of this phenomenon are scarce. One of the first to consider the relevance of social comparison for well-being, Schachter (1959) developed fear-affiliation theory, arguing that those who perceive themselves as under threat exhibit a higher desire to interact with others in the same condition, and concluding that "misery doesn't love just any kind of company, it loves only miserable company" (p. 24). Subsequent work has demonstrated that this phenomenon may be driven by a desire to seek information about the threat rather than a desire to affiliate with similar others.[2] Wills (1981) later proposed that when individuals experience a decline in well-being, they seek to mitigate this decline by comparing themselves with those who are worse-off or equally well-off as they are (engaging in downward and lateral social comparison, respectively). Buunk and Gibbons (2007) note that the great majority of the studies that have followed this work have examined downward, rather than lateral, social

[2]For an overview of origins and evolution of social comparison theory, see Buunk and Gibbons (2007).

comparison.

A 2014 study by Montizaan and Vendrik is, to our knowledge, one of the only empirical investigations to explicitly examine lateral social comparison in the context of a negative outcome. The authors make use of a reform in retirement savings policy in the Netherlands in order to investigate whether the job satisfaction of employees in various organizations who were disadvantaged by the reform is associated with the size of their cohort in the organization who share this negative outcome. They find that disadvantaged workers were less affected by the reform the greater the number of others who were similarly disadvantaged in the organization where they worked. Another related study was carried out by Cooper and Rege (2011), who find that behaviour under risk and uncertainty can be explained by 'social regret,' according to which people feel less regret about a poor choice they have made the more frequently this choice was also made by others.

Most of the existing literature addresses relative income levels (Clark et al. 2008, Card et al. 2012) versus other, non-monetary measures of relative utility. A much more limited literature addresses the relevance of such preferences with respect to non-monetary conditions (Solnick and Hemenway 1998, Alpizar et al. 2005). Solnick and Hemenway (1998) carry out a survey designed to investigate the role of positional preferences[3] on a variety of non-monetary domains beyond income, including attractiveness, intelligence, education, criticism or praise from a supervisor, and vacation time. They find that these preferences are most relevant with respect to positive (vs. negative) items, as well as for items that can be considered as critical for obtaining other objectives (e.g. intelligence and education) vs. items that are desirable in and of themselves (e.g. vacation time). Alpizar et al. (2005) elicit multiple choices in order to develop parameter estimates for positional preferences with respect to cars, housing, insurance, and vacation time. The authors find that positional concerns were highest for the consumption of conspicuous goods, namely cars and housing. In contrast to Solnick and Hemenway (1998),

[3]In what follows we refer to positional preferences in the large sense, i.e. not only the rank of one's status with respect to others, but also the proportion of others who share one's status.

they also find some degree of positionality with respect to insurance and vacation time. We note, however, that Alpizar et al. (2005) express consumption of these alternative goods in monetary terms, which brings their study closer to those treating positional preferences with respect to income.

By asking subjects to indicate which state of the world they prefer (i.e. which they would choose), versus which state of the world would make them happier, most investigations of positional preferences in the economics literature also privilege decision value over experience value (Tversky and Griffin, 1991). Given the potential for these different conceptions of utility can lead to different preference orderings, we think it important to expand the economic literature to consider a more inclusive notion of utility, specifically one that takes into account experience value in addition to decision value. Doing so would permit economists to explore the extent of the possible discrepancies in preferences produced by these two different conceptions of utility.[4]

Given these considerations, we add value to existing work on social comparison and well-being in four ways. First, we study experience (vs. decision) value. Second, we study lateral (vs. downward) social comparison. Both of these characteristics of our decision setting have received a great deal less attention in the literature to date than their respective alternatives. Third, rather than studying the relevance of positional considerations with respect to how people evaluate a static state of the world, we study their relevance with respect to how people evaluate a *change* in states, i.e. a process-dependent outcome. This is relevant to a range of common scenarios such as natural disasters, the implementation of public policies, and various health-related outcomes that are at least in part stochastically determined. Finally, we study positional preferences in a decidedly non-monetary domain. What's more, whereas previous studies concerning non-monetary conditions examined goods that are arguably reflective of one's

[4]Tvesky and Griffin (1991) identify two sources that could lead to a choice-judgement discrepancy in preference ordering: the well-documented presence of moral considerations and problems of self control on the one hand, and inaccuracies or bias in a decision-maker's prediction of the consequences his/her choices on the other.

effort and ability to succeed (e.g. cars and housing), our study design eliminates this potential confounding motivation by asking respondents to consider a reference point at which everyone is equally endowed (in our case, with or without a view of a park from their residence). Thus, this design has the added advantage of mimicking real-life scenarios in which changes in quality of life can be exogenous rather than endogenous. Given evidence suggesting that perceptions of outcome fairness can be process-dependent (Thulin and Bicchieri, 2016), we examine an outcome resulting from a process that people are assumed to have little control over (in this case, a public transportation project).

In what follows we carry out two experiments explicitly designed to test whether, in hypothetical scenarios involving a shock to quality of life, the perception that one's outcome is shared by a majority of others changes judgements regarding subjective well-being in these scenarios. While we are most interested in the impact of social information in the loss domain, we also include a hypothetical scenario in the gain domain as an interesting control in order to investigate whether the same can be said of happiness, i.e. does happiness love company? Since happiness and subjective well-being have been shown to impact subsequent decisions and performance (e.g. Wells and Iyengar, 2005), it makes sense that government and organizational leaders, who have access to information about the ubiquity of relative outcomes, could use this information strategically in interventions designed to foster greater well-being. Clark et al. (2008) also recognize the potential use for this type of information: 'We may not necessarily want to counteract activities which produce only a short-lived happiness 'buzz' at the expense of a long-run happiness cost, unless we believe that individuals are unaware of the fact that the 'buzz' may indeed only be ephemeral."

Given the findings of Montizaan and Vendrik (2014) and Cooper and Rege (2011), we formulate our Hypothesis 1: *providing social information about the prevalence of a negative shock to quality of life will reduce reported levels of disappointment associated with this outcome.* Regarding the impact of social information in the event of an unexpected increase in quality of

life, evidence of positional concerns suggests that people care not just about being well-off, but being better off than others (Clark et al. 2008, Grolleau et al. 2012). Given the findings of Solnick and Hemenway (1998), we suspect that the 'misery loves company' effect may not be true in the gain domain with respect to happiness. This leads us to our Hypothesis 2: *providing social information about the prevalence of a positive outcome may reduce reported satisfaction levels associated with this outcome.* We first conduct a preliminary study (Study 1) to explore the extent to which expectations support Hypothesis 1. The main analysis is carried out in Study 2, which directly investigates the evidence for hypotheses 1 and 2.

2 Study 1: Do most people believe that 'misery loves company'?

2.1 Design

As a preliminary investigation into the relevance of our research question, we implement a survey designed to determine whether people do indeed prescribe to the idea that 'misery loves company.' Specifically, we investigate whether people believe that perceptions of a shared outcome can impact well-being in the event of a decrease in quality of life. Study 1 is also motivated by the fact that it is important to understand how decision makers in organizations and governments expect interventions to impact the organization members and the public. Given evidence suggesting that people's expectations regarding others' behaviour are more accurate than expectations regarding their own (Balcedis and Dunning, 2013; Epley and Dunning 2000), it is important to examine the degree to which these beliefs are in fact accurate when it comes to the impact of interventions designed to manage well-being.

The survey was carried out in November 2016 on a sample of university students and their entourage in Montpellier, France.[5] As part of a class assignment, students in a graduate

[5]A frequent critique of student samples is that they cast doubt on the external validity of results. Nevertheless, there is cause for reasonable confidence in the sample. For instance, Mullinix et al. (2015)

economics course received several identical surveys and were asked to solicit responses from friends and family, which yielded a sample of 98 completed surveys. The sample was 58% male, with an average age of 27.4. Nine percent report their educational attainment as less than high school, 28% report having completed some college, and 63% report having obtained a bachelor's degree or higher. The survey invites participants to imagine a scenario in which an individual will shortly experience an unexpected decrease in quality of life, namely, losing their view of a green park from their private residence. We selected this particular good as one that we believe would matter to most people. Survey respondents are informed that, although they cannot change the situation of the individual in question, they can choose between two different messages to inform the individual of their unfortunate situation.

Both messages begin with the following statement: 'You live in an apartment where you enjoy a superb view of a magnificent park. As a result of new construction, your view will shortly be obstructed by a roadway structure and you will not be able to see the park at all.' One message, however, includes the following additional sentence: 'For your information, 85% of the residents in your apartment building will also lose their view of the park.' Respondents are then asked to choose which message they would use to deliver this information if their goal were for the individual to feel the least amount of disappointment possible. Respondents are also given the opportunity to indicate no preference between the two communication strategies.

2.2 Results

The results of Study 1 are quite striking and offer clear support for our hypothesis and confirmation of the results found by Montizaan and Vendrik (2014). Sixty-eight percent of

conducted two studies of how experimental treatment effects obtained from convenience samples compare to effects produced by population samples, finding "considerable similarity between many treatment effects obtained from convenience and nationally representative population-based samples." Exadaktylos et al. (2013) also find that "self-selected students are an appropriate subject pool for the study of social behavior," and Druckman and Kam (2011) encourage the use of dual samples of students and non-students, and suggest that many criticisms of student samples may be pre-mature. Taken together, these types of studies bolster confidence in the utility of convenience samples. Furthermore, with respect to our experiment, there is no theoretical reason to expect a student sample to diverge significantly from a non-student sample with respect to the specific preferences we study, especially given that we measure these preferences via subjective evaluations of satisfaction rather than via willingness-to-pay.

participants indicate that they would choose the message containing social information in order to reduce the amount of disappointment felt by apartment residents in this scenario. This proportion is significantly different from the null hypothesis of indifference ($p < 0.01$). We also detect a gender effect: women more frequently choose the message that includes social information over the message without social information than do men (80% vs. 62%, $p < 0.05$).

This indicates that people consider the provision of social information to be a useful strategy for mitigating decreases in subjective well-being, which offers clear preliminary support for our hypothesis regarding the potential role that this information can have as an intervention in cases of negative shocks to quality of life. Study 1 thus provides preliminary support for our hypothesis in the negative scenario, indicating that people do indeed expect social information to alleviate disappointment, confirming widespread ascription to the belief that misery loves company.

3 Study 2: What is the evidence that 'misery loves company'?

3.1 Design

In Study 2, we design a between-subjects experimental survey to investigate our research question more directly using a larger, representative sample of the U.S. population. Our intervention presents respondents with a hypothetical scenario involving a decrease in quality of life and elicits self-reported levels of well-being under conditions with and without social information regarding the prevalence of this outcome. As a control treatment, we also implement these conditions in the context of a positive shock to quality of life, yielding the experimental design shown in Table 1.[6]

The survey invites respondents to imagine the same scenario described in Study 1. The negative scenario reads: 'Please imagine the following scenario. You live in an apartment where

[6] We sought to obtain at least 258 valid observations per treatment. This minimum sample size was determined through a power analysis using the following conservative parameters: predicted difference in mean responses $\mu_0 - \mu_1 = 0.5, \sigma_0 = \sigma_1 = 1.75$ (based on Study 1), $\alpha = 0.05, \beta = 0.90$.

Table 1: Experimental design

Condition	*Scenario*	
	Negative	Positive
No social information	S1	S2
Social information	S3	S4

you enjoy a superb view of a green park. Due to a new development project, your view will soon be obstructed by a roadway structure and you will no longer be able to see the park.' The positive version reads 'Please imagine the following scenario. You live in an apartment where your view is obstructed by a roadway structure. Due to a new development project, the roadway structure will be removed and you will soon enjoy a superb view of a green park.'

In the social information conditions, an additional sentence is included: 'For your information, 85% of the residents of your apartment building will also lose their view of the park,' in the negative scenario, and 'For your information, 85% of the residents in your apartment building will also enjoy a view of the park,' in the positive scenario. After receiving information about the hypothetical scenario, respondents are asked to indicate the extent of their expected disappointment (in the negative scenario) or satisfaction (in the positive scenario) on a Likert scale ranging from 1 to 7 (1 = not at all satisfied/disappointed, 7 = extremely satisfied/disappointed).[7] We test our hypotheses on a representative sample of 2034 U.S. residents through the Time-sharing Experiments for the Social Sciences (TESS) platform, which provides social science researchers access to a probability-based panel of the U.S. household population.[8]

[7]We opted to use the word 'disappointment' instead of dissatisfaction based on preliminary feedback from a convenience sample of native English speakers indicating that 'disappointment' is a more fitting descriptor for what one would expect to experience in the negative scenario. Since our measurements of interest compare responses within scenarios that use the same descriptors, we do not view the difference in descriptors between the gain and the loss scenario as problematic.

[8]Data collected by Time-sharing Experiments for the Social Sciences, NSF Grant 0818839, Jeremy Freese and James Druckman, Principal Investigators. TESS contracts with NORC at the University of Chicago, which conducts online surveys using its AmeriSpeak©panel. Randomly selected US households are sampled with a known, non-zero probability of selection from the NORC National Sample Frame, and the final data is weighted to the appropriate population benchmarks for the target sample of interest in order to provide a representative sample. A number of additional standard measures were collected from participants, including strength of political beliefs, frequency of attendance at religion services, marital status, survey interview mode, state of residence, whether the household had internet access, type of telephone service for the household, and type of building of the participant's residence.

We elicit stated preferences under the assumption that they are indicative of individual experiences in a similar situation in real life. Hainmueller et al. (2015) moreover find that results from a stated preference vignette experiment closely correspond to revealed preferences in a natural experiment. We note that several studies have demonstrated a discrepancy between stated and revealed preferences, notably due to hypothetical bias. "Simply put, hypothetical bias in surveys reflects the old saying that 'there is a difference between saying and doing.'" (Loomis, 2014). According to Loomis (2011), "there is no widely accepted general theory of respondent behavior that explains hypothetical bias."

Several strategies have been proposed to minimize hypothetical bias, which can be distinguished as either ex ante or ex post approaches (Loomis, 2014). Ex ante approaches endeavor to design survey instruments to minimize the potential for bias to influence responses up front. Ex post methods can also be used to reduce stated preferences by calibrating stated WTP using certainty scales in order to reduce it to levels similar to those elicited by revealed preference approaches (Loomis, 2014). Given that our metric of interest, subjective satisfaction, can only be measured using stated preferences, we enlist the former approach to minimize hypothetical bias in participant responses by explicitly asking respondents to engage in the thought exercise and by using neutral language.[9] Given that we have no reason to believe that hypothetical bias will be present in one treatment more than another, however, any treatment effects should theoretically be free from concerns regarding hypothetical bias.

3.2 Results

Thirty-six observations were excluded due to item non-response, leaving 1998 observations for inclusion in the analysis, and six observations were excluded due to a very short survey duration (less than two minutes). The weighted sample is comprised of 54% women and 46% men and reports an overall average age of 47. Eighty-eight percent of

[9]Other methods used to design more reliable surveys include cautioning participants about the likelihood of certain biases (e.g. cheap talk) in hypothetical scenarios (Ami et al., 2011), oath procedures to tell the truth (Jacquemet et al., 2016), or commitment procedures (Ami et al., 2014).

respondents live in a metropolitan area, 65% are homeowners, 62% are employed (19% retired), 52% are married (21% have never been married, 13% are divorced), and 34% have obtained a Bachelor's degree or above (46% have completed some college and 17% have obtained a high school diploma). The sample is 68% white, 10% black, and 15% Hispanic. Sample-weighted overall mean satisfaction and disappointment levels across conditions are reported in Table 2.

Table 2: Weighted mean disappointment and satisfaction levels (s.e.)

Condition	*Scenario*	
	Positive (level of satisfaction)	Negative (level of disappointment)
No information	5.705 (0.095) n = 517	5.602 (0.095) n = 483
Information	5.719 (0.104) n = 507	5.5975 (0.092) n = 491

Sample-weighted t-tests indicate no statistical difference between mean responses across information conditions in the positive and negative scenarios ($p = 0.92$ and $p = 0.97$, respectively). Contrary to our hypothesis regarding the provision of information in the event of a negative shock to quality of life, the overall average level of well-being in the sample does not appear to be impacted by information regarding the outcomes of others in this hypothetical scenario. Mann-Whitney tests also fail to reject the null hypothesis that reported levels of satisfaction and disappointment between the information and the no information groups are taken from different underlying distributions ($p = 0.26$ and $p = 0.42$, respectively). Figures 1 and 2 show the distribution of reported levels of disappointment across information conditions in the negative and the positive scenarios, respectively.

Average reported satisfaction and disappointment levels do not change in a significant way across information conditions in our sample overall, which speaks to the relative stability of happiness levels in the face of single events (Graham 2010). The lack of significant difference is also likely to be reinforced by the fact that the event we consider is hypothetical in nature.

Figure 1: Negative scenario: Reported disappointment levels across information conditions

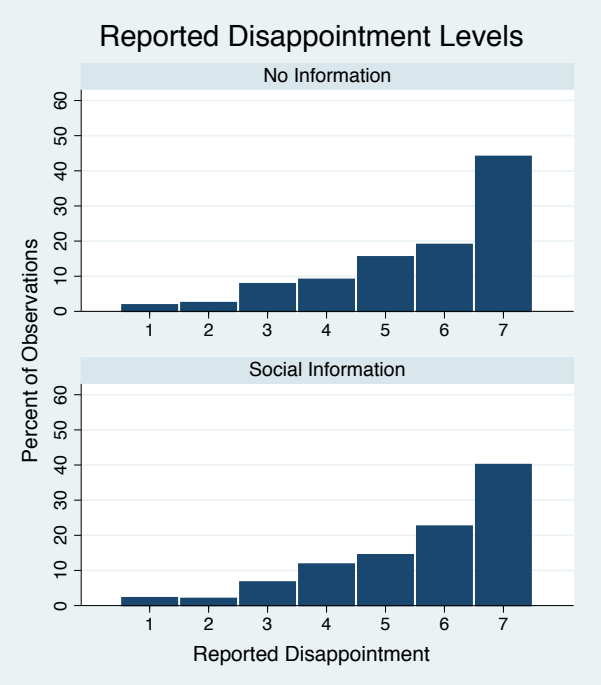
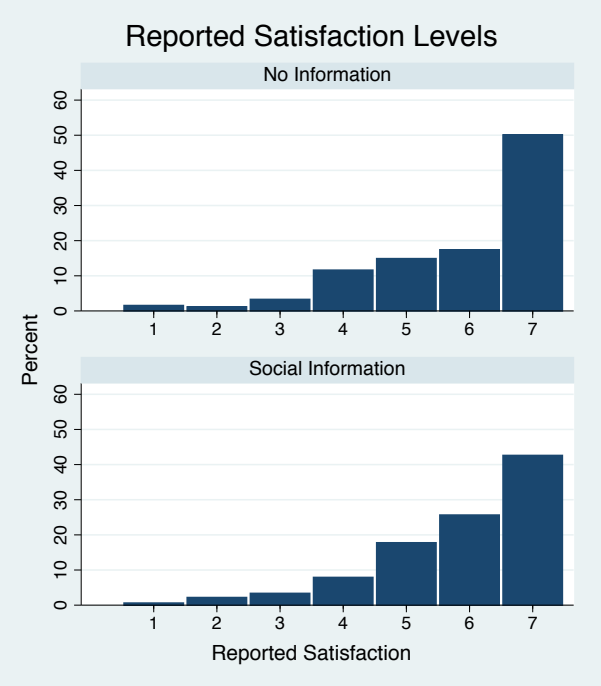


Figure 2: Positive scenario: Reported satisfaction levels across information conditions



In the negative scenario, the proportion of people reporting extreme disappointment is lower in the scenario with information (S3) relative to the scenario without (S1) at a level approaching significance ($p = 0.104$). In the positive scenario, the incidence of reports of extreme satisfaction was significantly lower in the condition without information (S2) relative to the

condition with information (S4, $p = 0.009$), indicating that the sample reports an extremely high level of satisfaction less frequently if they believe that their good fortune is shared by the majority of their cohort than if they are not provided any information about similarly fortunate others.[10]

Table 3: Proportion of people reporting extreme satisfaction/disappointment (s.e.)

Condition	*Scenario* Negative (level of disappointment)	Positive (level of satisfaction)
No information	0.441 (0.02) n = 483	0.501 (0.02) n = 517
Information	0.401 (0.02) n = 491	0.426 (0.02) n = 507

Table 4: Multiple hypothesis tests of difference in proportion of extreme disappointment and satisfaction across scenarios

Comparison	Difference	p-values *Unadjusted*	*Multiplicity-adjusted*		
			List et al. (2016)	Bonf.	Holm
S1 vs. S3	0.039	0.217	0.217	0.433	0.217
S2 vs. S4	0.074	0.018	0.034	0.035	0.035

Given the results in Tables 3 and 4, we perform two probit regressions in which the outcome variable is 1 if the respondent reported extreme satisfaction or disappointment, and 0 otherwise.[11] Regression results for the negative scenario and the positive scenario are reported in Tables 6 and 7, respectively. For each scenario, we present parameter estimates for two

[10]We also find that the magnitude of the impact of information on reports of extreme disappointment and satisfaction varies among groups. Residents of the five states in the East North Central region (Illinois, Indiana, Michigan, Ohio, and Wisconsin), for example, appear to be strongly impacted by social information, with 51.2% reporting extreme disappointment in S1 vs. 32.9% in S2 ($p < 0.001$), which suggests that such interventions may be especially effective when implemented in this region. Respondents who reported their religion as 'nothing in particular" also appeared to be affected by the provision of social information in the negative scenario, with 57.6% reporting extreme dissatisfaction in S1 vs. 20.0% in S3. Those who report their religion as 'just Christian' or Unitarian (Universalist), on the other hand, report extreme disappointment *more* frequently with the provision of information than without ($p = 0.01$ and $p = 0.03$, respectively).

[11]We also consider the possibility that a proportion of respondents may have been limited by the maximum range of the Likert scale. Furthermore, in the case of exogenous shocks to well-being, avoiding extreme dissatisfaction rather than moderate levels of dissatisfaction, is arguably of greatest policy relevance.

specifications. In the first column, we report the results of simple specification that includes the treatment covariate as well as all of the independent variables elicited. In order to explore the possibility that the provision of information may have heterogeneous impacts among different populations, in column two we also report the results of a specification in which the treatment covariate is fully interacted with each independent variable. For brevity, only statistically significant parameter estimates are reported.[12]

Table 6: Probit regression results on estimation sample: reporting extreme disappointment

	Simple model		*Interacted model*	
Independent variable (reference category)	Parameter estimate	Standard error	Parameter estimate	Standard error
Information provided	0.075	0.12	0.568	1.35
Female	0.611***	0.13	0.594***	0.18
Marital status (married)				
widowed	-0.765***	0.29	-0.762*	0.44
Metropolitan area resident	0.408*	0.21	0.797**	0.27
Employment (working as an employee)				
not working - other	-0.525**	0.26	-	-
Home type (detached one-family house)				
mobile home or trailer	-0.945**	0.44	0.899*	0.48
Household size (one)				
two	-0.561***	0.21	-0.642**	0.28
three	-0.520**	0.24	-0.774**	0.36
four	-0.877***	0.27	-0.901**	0.39
six	-0.797**	0.37	-1.057**	0.50
Religion ('nothing in particular')				
Protestant	-	-	-0.556*	0.33
Orthodox Christian	-	-	1.220**	0.62
Agnostic	-	-	-0.937**	0.45
'just Christian'	-	-	-0.789**	0.78
Information provided*Female	-	-	0.234	0.26
Information provided*Housing (owned or being bought)				
*occupied without payment	-	-	-2.411**	1.00
Information provided*Political ideology (moderate)				
*conservative	-	-	-0.558*	0.31
Information provided*Religion ('nothing in particular')				
*Protestant	-	-	1.430***	0.52
*Catholic	-	-	1.360**	0.55
*Jewish	-	-	3.080***	0.90
*Atheist	-	-	1.232*	0.64
*Agnostic	-	-	2.620***	0.68
*'just Christian'	-	-	2.031***	0.54
*something else	-	-	1.335*	0.74
Constant	-0.871	0.68	-0.072	1.00
F =	1.43		1.29	
N =	726		711	

*, **, and *** refer to p-values of less than 0.10, 0.05, and 0.01, respectively.

[12]Full results are available from the authors.

Table 7: Probit regression results on estimation sample: reporting extreme satisfaction

	Simple model		*Interacted model*	
Independent variable (reference category)	Parameter estimate	Standard error	Parameter estimate	Standard error
Information provided	-0.289**	0.12	-0.897	1.19
Female	0.381***	0.12	0.661***	0.18
Employment status (working as an employee)				
not working - looking for work	-0.713**	0.29	-0.903**	0.41
Marital status (married)				
widowed	0.603*	0.33	-	-
Region (New England)				
Mid-Atlantic	0.530*	0.30	-	-
Pacific	0.544*	0.28	-	-
Household size (one)				
four	0.786***	0.26	-	-
six	0.610*	0.32	-	-
Political ideology (Moderate)				
Liberal	-	-	-0.538**	0.22
Conservative	-0.332**	0.14	-0.712***	0.19
Religion ('nothing in particular')				
Jewish	0.893**	0.44	1.666***	0.64
Agnostic	0.833***	0.27	0.887**	0.40
Information provided*Female	-	-	-0.508**	0.25
Information provided*Race/ethnicity (white)				
*black	-	-	0.996**	0.43
Information provided*Age (18-24)				
*35-44	-	-	1.10*	0.56
Information provided*Marital status (married)				
*Never married	-	-	1.374***	0.47
Information provided*Political ideology (moderate)				
*Liberal	-	-	0.634**	0.32
*Conservative	-	-	0.851***	0.29
Information provided*Religion ('nothing in particular')				
*Jewish	-	-	-1.600*	0.91
*Athiest	-	-	1.017**	0.49
Constant	-0.898	0.57	-0.545	0.77
F =	1.78		1.48	
N =	723		716	

*, **, and *** refer to p-values of less than 0.10, 0.05, and 0.01, respectively.

Confirming previous tests, the provision of information appears to have a significant impact on the probability of reporting extreme satisfaction in the positive scenario, but no significant impact on the probability of reporting extreme disappointment in the negative scenario according to the simple specifications. In both scenarios, we observe that women are more likely to report extreme disappointment or satisfaction. For this model, the conditional marginal effect of information provision in the positive scenario is -6.8%, indicating that, holding all other covariates in the model at their weighted means, informing individuals that

their positive outcome is shared by 85% of their cohort reduces the probability that they will report extreme satisfaction by 6.8%. This is a modest reduction, however, given evidence of some heterogeneity in the sample, this effect may be more pronounced among some populations than others. We explore this possibility by specifying models that incorporate interaction terms that are intended to capture the way in which the provision of social information may impact different groups in different ways.

In the fully interacted models, we observe no significant main effect of information provision on the propensity to report extreme disappointment or satisfaction, at least among a population characterized by the reference category of each independent variable. However, several interaction effects are significant, indicating that there exists some heterogeneity in the sample regarding the impact of providing social information.[13] Positive coefficients for interacted terms indicates that the provision of information significantly increases the propensity for a member of the category of interest to report extreme disappointment or satisfaction when provided with social information in our hypothetical scenario. In the negative scenario, we observe that, for those who identify themselves as conservative (vs. moderate) and who report occupying their residence without payment (vs. renting or owning), the provision of social information reduces the likelihood of reporting extreme disappointment. This suggests the presence of a 'misery loves company' effect among these populations. For those who identify themselves as Protestant, Catholic, Jewish, Atheist, Agnostic, 'just

[13]Sociodemographic covariates are included according to data availability and there are reasons to expect that some covariates may impact self-reported subjective well-being. For example, a sizable literature suggests that women and men differ in the extent to which they can be influenced by others. Women tend to be more compliant and willing to conform with majority opinions while men are less likely to be influenced by others (e.g., Becker1986; Crawford et al. 1995 and references therein). In the consumption context, Park and Lessig (1977) have provided several arguments justifying why marital status is likely to impact susceptibility to social influence. They argue for example that there are differences between singles and married individuals in terms of capacity to cope with risk and uncertainty, social contacts, intensity of peer pressure on one's choice behavior, stages in the socialization process and degree of solidification of cognitive structures. Park and Lessig (1977) and Girard (2010) have also found empirical evidence that singles are more prone to social influence than married individuals. Additionally, two large field experiments (e.g., Panagopoulos and van der Linden, 2016; see also Jost et al., 2018 and references therein) found evidence that conservatives are more likely to respond to social influence attempts than liberals. Finally, according to Saraglou et al. (2009 and references therein), religion is positively associated with submission and conformity. The authors found that religious priming activates submissive behavior, especially among participants scoring high in personal submissiveness. This research suggests that religious beliefs and practices may make individuals more susceptible to social influence.

Christian', or something else (vs. 'nothing in particular'), however, our results suggest that providing information about the ubiquity of a negative outcome significantly increases the propensity to report extreme disappointment. Divergences in the way in which different groups are impacted by social information in the negative scenario may contribute to explaining why we observe no significant impact in the sample as a whole.[14]

Although women are more likely to report higher satisfaction overall than men in the positive scenario, they are also most sensitive to the provision of information in this scenario, reducing their reported satisfaction when information is provided relative to when it isn't. We also observe that the provision of social information appears to reduce the propensity to report extreme satisfaction among those reporting their religion as Judaism. In contrast, African Americans, those aged 35-44, those who have never been married, those who consider themselves to be either liberal or conservative (vs. moderate) and those who consider themselves to be Atheists, have a greater propensity to report extreme satisfaction if provided the information that 85% of their cohort share in a positive outcome.

4 Discussion

Although we find widespread belief in the notion that 'misery loves company' in Study 1, we find no significant main effect of social information provision on mean reported disappointment levels or the incidence of reports of extreme disappointment in the case of a negative shock to quality of life in Study 2. As a result, our findings suggest that misery does not, in fact, love company as much as most people believe. The lack of main effect in the negative scenario across the sample as a whole could be due to the hypothetical nature of the scenario, which may have limited its salience relative to a real-world scenario that entails

[14] Ordered probit regressions on the range of Likert responses are qualitatively similar to the probit regression results presented. In the simple model specification, information has a significant impact on the distribution of responses in the positive scenario only ($n = 726$ and 743, $F = 1.98$ and 11.15 for the negative and positive scenarios, respectively). In the interacted model, information provision is significant among females ($n = 726$ and 743, $F = 23.1$ and 10.4 for the negative and positive scenarios, respectively).

actual loss or gain in quality of life. Another possible explanation could be that the therapeutic effect of social information may predominantly apply to events considered to be relatively extreme and/or uncommon (e.g. being fired, losing one's home due to a natural disaster, experiencing an increase in taxes). If this perception moderates the beneficial subjective effect of social information, then it could be that many people in the sample did not perceive this event in such a way. Heterogeneity with respect to how much individuals value the particular change in question, i.e. losing one's view of a green park, could also account for the heterogeneity in our results. It comes as no surprise that these findings confirm that commonly-accepted assumptions should be critically examined before they form the basis of public or organizational policies.

Interestingly, we do find an overall effect of information provision in the positive scenario, indicating that providing social information regarding the ubiquity of a positive outcome *reduces* the likelihood of reporting extreme satisfaction in that scenario. Thus, although we do not find convincing evidence that 'misery loves company' within the sample overall, our results indicate that the opposite appears to be true in the case of unexpected positive shocks to quality of life. This represents, to our knowledge, the first direct empirical evidence suggesting the relevance of social information for well-being in a scenario involving a non-pecuniary change in quality of life.

Furthermore, we find that both of these results mask heterogeneous impacts of information provision within the sample. We contend that this heterogeneity constitutes a justification for further exploration of this issue. Further testing should notably be carried out the laboratory as well as the field, exploring whether these findings extend to situations in which people actually suffer a poor outcome that is common vs. uncommon (e.g. in the laboratory, receiving a very low share of money as a receiver in a dictator game). If significant results are indeed found in field settings and/or with real stakes, this would point to an opportunity for policymakers to reduce short term losses in subjective well-being. In this way,

information about the prevalence of negative outcomes could serve as an effective strategy to alleviate the suffering that inevitably results from the well-established human aversion to loss. To the extent that well-being measures can be useful in targeted public policies (Stone and Mackie 2013), exploring our hypothesis in other contexts could have implications for communications strategies employed not only by governments, but also by organizations such as businesses and universities. Our finding in the positive scenario, which could be summarized by the expression 'happiness hates company,' indicates that knowing that one's good fortune is shared by a majority of others diminishes the satisfaction felt in the event of unexpected positive outcomes. With this knowledge, communicators and policymakers could, alternatively, avoid tempering potential increases in satisfaction by refraining from providing information that positive changes to quality of life may be widespread, as has been suggested by Clark et al. (2008).

Although the use of student samples has become common in social sciences research, several authors (e.g., Sears, 1986; Peterson, 2001; Belot et al., 2015) have argued that students should be considered a "narrow data base", leading to potential concerns about the generalizability of findings drawn uniquely from these samples. We cannot disregard the possibility that student samples may have characteristics that can challenge the generalizability of the obtained results. It is reasonable to assume, for example that students tend to earn more after they graduate, tend to be more likely to move than other age groups, and have little experience with housing transactions and relationships with other neighbors as fellow homeowners. Moreover, students may also have a lower reference point for housing quality than more representative and heterogeneous samples. Taken together, these characteristics may make them less sensitive to the experimental manipulations we employ. Additionally, their current reference group (e.g., other students in the same dorm) may not be considered in the same way as homeowners would consider neighbors, which could also serve to reduce their sensitivity to the experimental manipulation. Extending the survey to a more

general sample would be an interesting extension of this work to analyze the existence of such a bias and draw more specific policy implications.

Other extensions of this line of inquiry stand to generate new and valuable knowledge that could, with little risk, be put into practice relatively rapidly and have the potential to inspire interesting avenues for further research across many contexts. While an interesting extension would be to have a treatment where the information consisted of a message that the individual was in a minority affected vs. in a majority, this research would be less relevant for policy given that such conditions cannot be manipulated in natural settings. If social information regarding non-pecuniary outcomes is found to impact subjective well-being in other contexts, for example, can it also impact behaviour (e.g. helping behaviour[15])? Investigating the extent to which the impact of information provision depends on the proportion of people who share the situation (e.g. 85%), the way in which this information is framed (i.e. 85% share your situation vs. 15% do not share your situation), the nature of the event (e.g. deliberate vs. incidental cause), and the nature of the good in question (public vs. private), would be natural and important issues for future research that explores the bounds within which social comparison can be leveraged to enhance well-being. Given evidence that events with permanent implications entail long-term loss in subjective well-being, whereas those with shorter-lived implications do not (e.g. physical disability, as in Jones et al., 2018), investigating the temporal persistence of the effects we find here would also be a relevant and useful extension to this work.

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[15]This has indeed been hypothesized as an explanation for the remarkably high levels of civic engagement and social solidarity observed during the Great Depression.

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Supplementary Materials: Experimental Protocols

Study 1 (translated from French)

Please complete this anonymous questionnaire. The two parts are completely independent. Please respond as honestly as possible to these questions. There are no right or wrong answers.

Part 1

In the two descriptions below an individual suffers a change in situation. You are not able to change the situation of this individual, but you can choose how it is presented to him/her. If your objective is for the individual to feel the least amount of disappointment possible, which of these two descriptions would you choose to inform the individual of their situation?

'You live in an apartment where you enjoy a superb view of a magnificent park. Due to a construction project, your view will shortly be obstructed by a roadway structure and you will no longer be able to see the park at all."	'You live in an apartment where you enjoy a superb view of a magnificent park. Due to a construction project, your view will shortly be obstructed by a roadway structure and you will no longer be able to see the park at all. *For your information, 85% of the residents of your building will also lose their view of the park.*"
I would choose this description that does not mention the situation of others. ☐	I would choose this description that mentions the situation of others ☐

If you are indifferent between the two descriptions, please check both boxes.

Part 2: Additional Information

You are a: Man ☐ Woman ☐
Your age: _____ years
Education level:
Less than high school ☐ Some college ☐ Bachelor's degree or higher ☐

Study 2

[negative control]

Please imagine the following scenario. You live in an apartment where you enjoy a superb view of a green park. Due to a new development project, your view will soon be obstructed by a roadway structure and you will no longer be able to see the park.

On a scale of 1-7, where 1 is not at all disappointed and 7 is extremely disappointed, please rate how you feel about this change below.

Not at all disappointed	Slightly disappointed	Somewhat disappointed	Moderately disappointed	Quite disappointed	Very disappointed	Extremely disappointed
1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐

[negative social information]

Please imagine the following scenario. You live in an apartment where you enjoy a superb view of a green park. Due to a new development project, your view will soon be obstructed by a roadway structure and you will no longer be able to see the park. For your information, 85% of the residents of your apartment building will also lose their view of the park.

On a scale of 1-7, where 1 is not at all disappointed and 7 is extremely disappointed, please rate how you feel about this change below.

Not at all disappointed	Slightly disappointed	Somewhat disappointed	Moderately disappointed	Quite disappointed	Very disappointed	Extremely disappointed
1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐

[positive control]

Please imagine the following scenario. You live in an apartment where your view is obstructed by a roadway structure. Due to a new development project, the roadway structure will be removed and you will soon enjoy a superb view of a green park.

On a scale of 1-7, where 1 is not at all satisfied and 7 is extremely satisfied, please rate how you feel about this change below.

Not at all satisfied	Slightly satisfied	Somewhat satisfied	Moderately satisfied	Quite satisfied	Very satisfied	Extremely satisfied
1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐

[positive social information]

Please imagine the following scenario. You live in an apartment where your view is obstructed by a roadway structure. Due to a new development project, the roadway structure will be removed and you will soon enjoy a superb view of a green park. For your information, 85% of the residents in your apartment building will also enjoy a view of the park.

On a scale of 1-7, where 1 is not at all satisfied and 7 is extremely satisfied, please rate how you feel about this change below.

Not at all satisfied	Slightly satisfied	Somewhat satisfied	Moderately satisfied	Quite satisfied	Very satisfied	Extremely satisfied
1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐