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3 March 2022

Online at <https://mpra.ub.uni-muenchen.de/112198/>
MPRA Paper No. 112198, posted 08 Mar 2022 08:47 UTC

Social Preferences and Well-Being: Theory and Evidence

Masaki Iwasaki¹

Abstract

The education systems of many countries emphasize the development of prosocial preferences. Clarifying how these preferences are related to well-being is therefore essential. Although many studies have shown that particular prosocial behaviors increase subjective well-being, it is unclear whether prosocial preferences rather than prosocial behaviors are associated with greater well-being. This study presents a model in which differences in social preferences explain differences in subjective well-being. Then, using survey data from the United States, it finds an association between social preferences and well-being. We measured social preferences using the Slider Measure of social value orientation to evaluate prosociality as a continuous variable. Using the Pemberton Happiness Index, we also measured subjective well-being in terms of the multiple dimensions of general well-being, hedonic well-being, eudaimonic well-being, social well-being, and experienced well-being. Regression analysis revealed that the effect sizes of social value orientation on hedonic well-being and eudaimonic well-being were 0.19 and 0.15, respectively, which are comparable to the effect sizes of parenthood, income, and education.

Keywords Social preferences · Well-being · Social value orientation · Prosociality · Happiness

JEL Classification A13 · D64 · I31

1 Introduction

The education systems of many countries emphasize the development of prosociality at every stage, from primary school to higher education. But why is it important to develop prosociality? There are several possible answers to this fundamental question, but one is that having a

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prosocial preference will lead to greater personal well-being (i.e., happiness) in later life. Proverbs and sayings about the close relationship between being a person who cares about others and one's own happiness are common at all times and in all places, implying that people have long recognized the importance of prosociality. Despite its significance, though, the relationship between social preferences and subjective well-being has not been fully examined by scientific methods. This study presents a theoretical framework for analyzing this question and provides evidence of the positive correlation between prosociality and various domains of subjective well-being from survey data of adults in the United States.

In this paper, we define a *social preference* as an individual's preference regarding the payoffs or well-being of others.² Social preference pertains to how the individual ranks possible combinations of personal payoffs and the payoffs of others. One's social preference can be prosocial or non-prosocial, depending on the degree to which one cares about the interests of others.

We define *prosociality* as the tendency of an individual to care about the payoffs or well-being of others. Although this concept is similar to that of a social preference and is often used interchangeably with it, prosociality differs in that we can think of levels of prosociality, such as high and low levels. Individuals with high prosociality care more about the payoffs of others; individuals with low prosociality care less. Distinguishing between *preferences* and *behaviors*, we assume that individuals engage in prosocial behaviors—behaviors that help or benefit others—on the basis of their social preferences and that persons with higher prosociality are more likely to engage in prosocial behaviors.

There is enormous literature on the relationship between prosocial behavior and well-being. Examples of prosocial behavior include volunteering and donating money. Theoretically, the causal relationship between prosocial behavior and happiness is reciprocal: the happiness of people increases when they engage in prosocial behavior, and happier people are more likely to engage in such behavior. Many empirical studies have found only a correlation between the two, but some have also found a causal relationship (Meier and Stutzer 2008; Aknin et al. 2012; Boenigk and Mayr 2016; Lawton et al. 2021). Unlike these studies, the present study examines the relationship between social *preferences* and happiness rather than between prosocial *behavior* and happiness. It has been shown that social preference or prosociality is relatively stable (Van Lange and Semin-Goossens 1998; Böhm et al. 2021), and we are interested in whether prosociality correlates with well-being.

This paper provides a theoretical model to analyze well-being when individuals have heterogeneous social preferences. When discussing social preferences and well-being, assumed relationships between relevant variables differ depending on the person, and verbal models do not sufficiently avoid ambiguity. This paper, therefore, develops a formal model to mathematically define the relationships among social preferences, prosociality, and well-being

² Other scholars have defined social preferences in a similar way. See Fehr and Krajbich (2014).

and then describes the hypothesis to be tested by empirical analysis. The theoretical model is developed only to the extent necessary for the empirical analysis and is quite simple.

Then, in the empirical analysis, we test the hypothesis that prosociality is associated with happiness. Although researchers have developed various measures of prosociality, we assess prosociality by measuring social value orientation (SVO) using the Slider Measure developed by Murphy et al. (2011). The Slider Measure is excellent in that it treats SVO not only as a traditional category variable but also as a continuous variable. We also measure various aspects of well-being with the Pemberton Happiness Index developed by Hervás and Vázquez (2013). Their index consists of the sub-domains of remembered and experienced well-being, and remembered well-being consists of general well-being, eudaimonic well-being, hedonic well-being, and social well-being. In order to test the hypotheses, regression analysis was conducted with each form of well-being as the dependent variable and the SVO score, a continuous variable, as the independent variable. Parenthood, political preference, income, and education, which have been used in previous studies, were also used as independent variables. Gender, age, employment, and marital status were used as control variables.

The regression analysis showed that the effect sizes of SVO on each form of well-being were generally the same as the effect sizes of parenthood, income, and education. Focusing on the regressions for eudaimonic well-being and hedonic well-being, the standardized coefficients of SVO were 0.147 and 0.187, respectively. The coefficients of SVO were statistically significant in the regression equations for total well-being, remembered well-being, eudaimonic well-being, and hedonic well-being. When regression analysis with the categorical SVO as the dependent variable was also conducted for the sake of comparison with previous studies and performing a check of robustness, the results remained almost unchanged.

This paper contributes to the study of well-being. Researchers have examined various determinants of happiness, including parenthood (Pollmann-Schult 2014; Radó 2020), political preference (Napier and Jost 2008; Onraet et al. 2017), income (Boyce et al. 2010; FitzRoy and Nolan 2022), and education (Cuñado and de Gracia 2012; Nikolaev 2018). Because people live in society, it is natural that social preferences affect happiness. But this point has not been fully examined. The present study shows that prosociality is correlated with happiness and has the same effect size as other essential factors. As will be discussed in Section 5, this fact has important implications for educational and other policies.

This study also contributes to the literature on social preferences. The study of SVO, an aspect of social preferences, has a long history (Messick and McClintock 1968; Murphy and Ackermann 2014), and previous studies have shown that SVO is a predictor variable for many behaviors, including volunteer and donation behaviors (McClintock and Allison 1989; Van Lange et al. 2007; Van Lange et al. 2011; Shahrier et al. 2017). But such studies have not made clear whether the level of well-being differs among individuals with different SVOs; and, if it

does differ, in which domains of well-being it differs and to what extent. The present study provides evidence on these questions.

This study also contributes to the theory of heterogeneous preferences. Looking at individuals with different social preferences, namely selfish and prosocial individuals, Fehr and Schmidt (1999) showed that the distribution of preferences affects whether competition or cooperation occurs in equilibrium. Our results, which show that the distribution of preferences is closely linked to the distribution of well-being, provide a new perspective of considering the welfare of society as a whole, given the existence in that society of individuals with different social preferences. Decancq et al. (2017) presented a method of calculating inequality in well-being by considering the heterogeneous preferences of individuals. Our results, which show that the level of well-being can vary depending on the level of prosociality, suggest the need to consider heterogeneous *social* preferences or prosociality as well when considering the heterogeneous preferences of individuals.

Section 2 provides a theoretical framework for heterogeneous social preferences and well-being. Section 3 describes the methodology for testing the hypothesis about the correlation between prosociality and happiness. Section 4 reports the results of the regression analysis. Section 5 presents the conclusions of this paper and discusses policy implications.

2 Theory of Heterogeneous Social Preferences and Well-Being

To structure our thinking, we extend the model of heterogeneous preferences and well-being developed by Decancq et al. (2017) to the case of heterogeneous *social* preferences.

Suppose that there are n individuals in a society. We assume that the outcomes of life in dimension $m > 1$ affect the well-being of each individual, and we denote the outcome vector for each individual i by $\mathbf{l}_i = (l_i^1, l_i^2, \dots, l_i^m)$. Each person i has a well-behaved preference order R_i for his or her set of outcome vectors. These preferences mean well-considered judgments about what each individual considers to be the good life. We assume that the preference order R_i of each individual i can be expressed as a function of a preference vector consisting of k parameters $\mathbf{a}_i = (a_i^1, a_i^2, \dots, a_i^k)$; that is, $R_i = R(\mathbf{a}_i)$. We assume that the subjective well-being WB of each individual i depends on the outcome vector \mathbf{l}_i and the preference vector \mathbf{a}_i : $WB(\mathbf{l}_i, \mathbf{a}_i)$.

These assumptions are the same as those of the model used by Decancq et al. But because we want to consider social preferences explicitly, we are adding a few more assumptions. Suppose that the subjective well-being WB of each individual i also depends on the outcomes of individuals other than i , and we denote the outcome matrix by $\mathbf{L}_{-i} = (\mathbf{l}_1, \mathbf{l}_2, \dots, \mathbf{l}_{i-1}, \mathbf{l}_{i+1}, \dots, \mathbf{l}_n)$. This means that the well-being WB of each individual i depends not only on \mathbf{l}_i but also on \mathbf{L}_{-i} . Let \mathbf{L} denote the outcomes in the society. Now the well-being

WB of each individual i depends on the outcome matrix \mathbf{L} and the preference vector \mathbf{a}_i : $WB(\mathbf{L}, \mathbf{a}_i)$. We also assume that the p -th preference parameter of each individual i , a_i^p , is a prosociality parameter, which represents a preference about the outcomes of other individuals \mathbf{L}_{-i} .

Depending on a_i^p , each individual i can have a higher well-being with the same personal outcome \mathbf{l}_i if the outcomes of other individuals in the society \mathbf{L}_{-i} have better values. If for all individuals $j \neq h$ it is the case that $\mathbf{l}_j^* = \mathbf{l}_j$, and for individual h it is the case that for $\boldsymbol{\delta} \in \mathbb{R}_+^m \setminus \{0\}$, $\mathbf{l}_h^* = \mathbf{l}_h + \boldsymbol{\delta}$, we denote the outcome matrix by \mathbf{L}^* . We can now define prosocial preferences.

Definition. Individual i has a *prosocial preference* $R_i = R(\mathbf{a}_i)$ if

$$WB(\mathbf{L}^*, \mathbf{a}_i) > WB(\mathbf{L}, \mathbf{a}_i) \Leftrightarrow \mathbf{L}^* R(\mathbf{a}_i) \mathbf{L} \quad (1)$$

On the basis of this definition, it follows that individual i has a *non-prosocial preference* if $WB(\mathbf{L}^*, \mathbf{a}_i) \leq WB(\mathbf{L}, \mathbf{a}_i)$.

We are interested in whether, in general, individuals with prosocial preferences have a higher level of well-being than individuals with non-prosocial preferences, given the same personal outcome and the same outcomes for others. Suppose that individuals i and j have a different prosocial preference parameter for each other. This means that $a_i^p \neq a_j^p$, where a_i^p is the prosocial parameter for individual i and a_j^p is the prosocial parameter for individual j . Suppose also that individual i has a prosocial preference $R(\mathbf{a}_i)$, but individual j has a non-prosocial preference $R(\mathbf{a}_j)$. We are interested in whether the following is generally (not always) true in the real world for any outcome \mathbf{L} where $\mathbf{l}_i = \mathbf{l}_j$:

$$WB(\mathbf{L}, \mathbf{a}_i) > WB(\mathbf{L}, \mathbf{a}_j). \quad (2)$$

More generally, the level of the prosocial parameter a_i^p of each individual i may be correlated with the level of subjective well-being $WB(\mathbf{L}, \mathbf{a}_i)$ whether or not the individual's preference is prosocial.

Hypothesis. The level of prosociality is correlated with the level of subjective well-being.

We will now empirically examine this hypothesis.

3 Methodology

3.1 Social Preferences

3.1.1 SVO

The various aspects of prosociality make it difficult to measure the level of prosociality. This paper, therefore, uses SVO as a variable that represents only one aspect of prosociality, which is easier to measure.

After mathematician John von Neumann and economist Oskar Morgenstern established the foundations of game theory in the 1940s (Neumann and Morgenstern 1944), formal analyses of interactions among decision-makers became possible. These analyses usually assumed that each individual pursues his self-interest. The assumption enabled formal analyses and, in many cases, useful predictions. Inspired by this research, other investigators studied cases in which individuals may care about the interests of others as well as their own. In 1968, psychologists David Messick and Charles McClintock devised so-called decomposed games (Messick and McClintock 1968). A decomposed game is a game in which a decision-maker has a unilateral choice about how to allocate resources between himself and another person. Influenced by this study, the concept of SVO eventually emerged.

On the basis of SVO, people can be categorized into two main groups: prosocial and proself. Proself people are mainly concerned with their own self-interest, and prosocial people care about the interests of others as well as their own self-interest. Prosocial and proself groups can, in turn, be subdivided in accordance with specific motivations. The groups most often distinguished are prosocial, individualistic, and competitive (Murphy and Ackermann 2014). In the case of two persons, a prosocial person maximizes joint gains for himself and the other person. An individualistic person maximizes self-gain, and a competitive person maximizes the difference between self-gain and the other person's gain.

Studies have shown that SVO can predict various behavior. For instance, to study an association between SVO and volunteer behavior, McClintock and Allison (1989) classified students at a U.S. university into three groups based on their SVO: prosocial, individualistic, and competitive. The students were asked to volunteer for a psychological research project at their university and to indicate how many hours they would contribute. Prosocial students devoted more hours to the research. Van Lange et al. (2011) showed that prosocial students at a Netherlands university were more likely than individualistic and competitive students to volunteer to participate in psychological experiments.

Studies have also shown that SVO predicts donating behavior. When Van Lange et al. (2007) conducted a questionnaire survey in the Netherlands to ask participants about their donations, they found that prosocial people donated more often than individualistic and

competitive people, especially to organizations for poor and ill people. The results of a survey conducted in three regions of Bangladesh by Shahrier et al. (2017) similarly showed that prosocial people donated more money to humanitarian activities than individualistic and competitive people did. These studies suggest that SVO has predictive power in both developed and developing countries.

3.1.2 Measurement Method

Previous studies have developed a variety of methods for measuring SVO (Messick and McClintock 1968). The present article uses the Slider Measure developed by Murphy et al. (2011), a method that many scholars have begun to use.

In the Slider Measure method, subjects are asked to choose an allocation of gains between the self, the subject, and the other person in six different situations.³ In each situation, subjects have nine options for allocating the gains, as shown in Table 1. The gains in the six situations are indicated by the six dotted lines in Figure 1. The vertical axis represents the other’s gain, and the horizontal axis represents the subject’s gain. The four points (50, 100), (85, 85), (100, 50), and (85, 15) correspond to idealized altruistic choices, prosocial choices, individualistic choices, and competitive choices when a person chooses an allocation of self-gain and the other-gain from allocations located on the circle. The gains in the six situations are located on the six dotted lines that interconnect these four points. Each of the six situations corresponds to one of the six dotted lines.

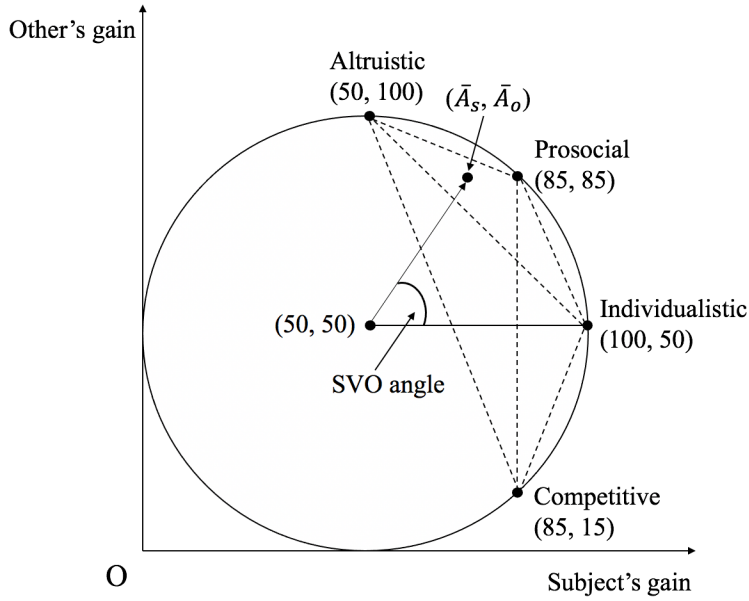
Table 1 Choices in the Slider Measure

1	Own	85	85	85	85	85	85	85	85	85
	Other	85	76	68	59	50	41	33	24	15
2	Own	85	87	89	91	93	94	96	98	100
	Other	15	19	24	28	33	37	41	46	50
3	Own	50	54	59	63	68	72	76	81	85
	Other	100	98	96	94	93	91	89	87	85
4	Own	50	54	59	63	68	72	76	81	85
	Other	100	89	79	68	58	47	36	26	15
5	Own	100	94	88	81	75	69	63	56	50
	Other	50	56	63	69	75	81	88	94	100
6	Own	100	98	96	94	93	91	89	87	85
	Other	50	54	59	63	68	72	76	81	85

Notes: The author based this table on data provided by Murphy et al. (2011, p. 772).

³ These six items are called primary items. The Slider Measure also includes nine secondary items for analyzing prosocial motivations in further detail, but this paper does not use them.

Fig. 1 Plane of the subject's gain and the other's gain



Notes: The author based this table on the description of Murphy et al. (2011, p. 773).

After a subject chooses allocations in the six situations, the mean gain of the subject \bar{A}_s and the mean gain of the other \bar{A}_o are calculated. Then 50 is subtracted from each mean gain so that the angle of the point (\bar{A}_s, \bar{A}_o) to the center of the circle (50, 50) can be calculated. The SVO score of each subject is defined as the arctangent of the ratio of these adjusted means:

$$SVO^o = \arctan\left(\frac{\bar{A}_o - 50}{\bar{A}_s - 50}\right), \quad (3)$$

where SVO^o is the SVO score, also called the SVO angle. Murphy et al. recommend that SVO be used as a continuous construct because it measures how much an individual sacrifices in order to make another individual better off. Nevertheless, the Slider Measure can classify subjects in terms of conventional categories. Based on the SVO scores, subjects can be classified as follows: altruistic ($SVO^o > 57.15$), prosocial ($57.15 > SVO^o > 22.45$), individualistic ($22.45 > SVO^o > -12.04$), and competitive ($-12.04 > SVO^o$). This classification is especially useful for comparing the results of various studies, since many studies used this classification before the Slider Measure came into general use.

3.2 Well-Being

3.2.1 Remembered Well-Being and Experienced Well-Being

Instances of subjective well-being can be divided into remembered well-being and experienced well-being; i.e., they can be distinguished with respect to when the experiences are being evaluated. Remembered well-being is an evaluation of one's experiences after these experiences are over, as one remembers them. Experienced well-being is an evaluation of one's experiences in real time. Remembered well-being may be biased by imperfect memory, imperfect conditions of evaluation, and other factors (Kahneman and Riis 2005). Experienced well-being may not fully capture the long-term effects of experiences on well-being (Oliver 2017). For these reasons, these two forms of reporting well-being should be used complementarily.

3.2.2 General Well-Being, Eudaimonic Well-Being, Hedonic Well-Being, and Social Well-Being

Remembered well-being can be subdivided into general well-being, eudaimonic well-being, hedonic well-being, and social well-being. General well-being is an evaluation of life satisfaction, a global evaluation of life as assessed by a person's own criteria (Diener et al. 1985). Eudaimonic well-being is an evaluation of one's actualization of potential. Hedonic well-being is an evaluation of the balance of pleasure and pain (Ryan and Deci 2001). Social well-being is an evaluation of a person's circumstances and functioning in society (Keyes 1998).

Eudaimonic and hedonic views of well-being have long histories (Ryan and Deci 2001). The ancient Greek philosopher Aristotle considered hedonic happiness to be vulgar. He thought that engaging in virtuous activities is important and that happiness is the actualization of human potential. Another ancient Greek philosopher, Aristippus, thought that the proper goal of life is to maximize pleasure and that happiness is the sum of momentary pleasures. Eudaimonic well-being is often regarded as more enduring than hedonic well-being because the realization of potential is usually not a fleeting phenomenon, whereas simple pleasure and pain tend to be momentary (Steger et al. 2008).

3.2.3 Measurement Method

Although many methods have been developed to measure different aspects of well-being, most measure only a single domain of well-being. Because our interests lie in the relationship

between various domains of well-being and SVO, we want to use a method that covers many domains. The Pemberton Happiness Index developed by Hervás and Vázquez (2013) does so.

Hervás and Vázquez combined several widely used scales of well-being in order to measure both remembered well-being and experienced well-being. In the case of remembered well-being, subjects are asked to rate the statements in Table 2 on an 11-point Likert scale (0 = total disagreement, 10 = total agreement). Remembered well-being is measured as the mean score of these 11 ratings. The sum of raw scores divided by 11 provides a mean score ranging from 0 to 10.

As a domain of remembered well-being, eudaimonic well-being has six components: life meaning, self-acceptance, personal growth, relatedness, perceived control, and autonomy. These components are based on the model of psychological well-being developed by Ryff (1989). They are measured by questions from (r3) to (r8). Hedonic well-being has only two components, positive affect and negative affect, which are based on the Positive and Negative Affect Schedule (PANAS) scale developed by Watson et al. (1988). They are measured by questions (r9) and (r10).

Table 2 Items measuring remembered well-being

Subdomains		Items
General		(r1) I am very satisfied with my life. (r2) I have the energy to accomplish my daily tasks.
Eudaimonic	Life meaning	(r3) I think my life is useful and worthwhile.
	Self-acceptance	(r4) I am satisfied with myself.
	Personal growth	(r5) My life is full of learning experiences and challenges that make me grow.
	Relatedness	(r6) I feel very connected to the people around me.
	Perceived control	(r7) I feel able to solve the majority of my daily problems.
	Autonomy	(r8) I think that I can be myself on the important things.
Hedonic	Positive affect	(r9) I enjoy a lot of little things every day.
	Negative affect	(r10) I have a lot of bad moments in my daily life. (reverse scoring)
Social		(r11) I think that I live in a society that lets me fully realize my potential.

Notes: Items are taken from Hervás and Vázquez (2013, p. 8).

Table 3 Items measuring experienced well-being

Items
(e1) Something I did made me proud.
(e2) At times, I felt overwhelmed.
(e3) I did something fun with someone.
(e4) I was bored for a lot of the time.
(e5) I did something I really enjoy doing.
(e6) I was worried about personal matters.
(e7) I learned something interesting.
(e8) I gave myself a treat.
(e9) Things happened that made me really angry.
(e10) I felt disrespected by someone.

Notes: Items are taken from Hervás and Vázquez (2013, p. 8).

To measure experienced well-being, subjects are asked to answer yes or no regarding whether the events listed in Table 3 occurred the day before. Items (e1), (e3), (e5), (e7), and (e8) are positive experiences; items (e2), (e4), (e6), (e9), and (e10) are negative experiences. The occurrence of each positive experience is counted as 1, and the non-occurrence of each negative experience is also counted as 1. The sum of these scores is used as a single score that ranges from 0 (no positive experiences and 5 negative experiences) to 10 (5 positive experiences and no negative experiences).

Total happiness, which includes both remembered well-being and experienced well-being, is calculated by adding a subject's scores for remembered well-being (11 scores) and experienced well-being (1 score), then dividing this total score by 12 to obtain a mean score that ranges from 0 to 10.

3.3 Participants and Procedure

The data were collected using Amazon Mechanical Turk (MTurk), an online crowdsourcing platform.⁴ In March 2016, the author recruited people in the United States.⁵ The sample size was 212. The participants were asked to complete the Slider Measure first, then to complete the questionnaires for the Pemberton Happiness Index and answer demographic questions. The

⁴ This method of collecting data has been used extensively to recruit participants for surveys and experimental studies in social sciences like psychology and economics. Researchers have confirmed that the data collected using MTurk are at least as reliable as data acquired by other standard methods, such as by recruiting college students. See Buhrmester et al. (2011).

⁵ The study was conducted in accordance with the ethical standards of the 1964 Declaration of Helsinki and the ethical standards of the author's institution. The author obtained informed consent from all participants in the study.

mean time that the participants took to complete the entire procedure was 3 minutes and 30 seconds. The participants received 0.5 U.S. dollars for their participation.

3.4 Regression Model

To analyze the impact of SVO on well-being in a way that takes into account other independent variables, we use regression analysis. This is the regression model:

$$WB_i = \alpha + \beta SVO_i + \gamma' \mathbf{x}_i + \delta' \mathbf{z}_i + \varepsilon_i. \quad (4)$$

In this model, the dependent variable WB_i is the subjective well-being of individual i . To analyze the multiple aspects of well-being, we use the scores for total well-being, remembered well-being, general well-being, eudaimonic well-being, hedonic well-being, social well-being, and experienced well-being as dependent variables.

The independent variable of interest SVO_i is the SVO score of individual i . In our basic model, we follow the recommendation of Murphy et al. (2011) in regarding SVO as a continuous construct and using the SVO score as an independent variable. In order to compare our results with those of previous studies, we also estimate a model using a binary variable as an independent variable instead of the SVO score. The binary variable classifies individuals into prosocial and individualistic individuals based on their SVO score while leaving other variables unchanged.

The symbol \mathbf{x}_i represents a vector of the other independent variables. Researchers have found that many factors affect well-being, and in this study, we use parenthood, political preferences, income level, and education level as independent variables.

Despite the costs and stress of child-rearing, in general, parenthood positively affects well-being (Pollmann-Schult 2014; Radó 2020). We use a binary variable to indicate whether a respondent has one or more children as an independent variable. With respect to political preferences, political conservatives are known to have higher subjective well-being than political liberals (Napier and Jost 2008; Onraet et al. 2017). We use a categorical variable representing political preferences as an independent variable. Participants are categorized as Republican, Democratic, Independent, or Other. With respect to income, researchers have shown that results vary depending on whether the concept of income rank, relative income, or household income is used; but, in general, income positively affects well-being (Boyce et al. 2010; FitzRoy and Nolan 2022). We have data only on categories of household income levels, so we treat income as an ordinal variable. Regarding education, its impact on well-being is complex as well. But in general, higher levels of education positively influence well-being (Cuñado and de Gracia 2012; Nikolaev 2018). We treat education as a categorical variable because we have data on the final educational degrees of the respondents.

The symbol \mathbf{z}_i represents a vector of the control variables, including variables indicating gender, age, employment status, and marital status. A variable of gender is a binary variable, and the other variables are categorical. The symbol ε_i is the error term.

4 Results

We first see the demographic data of the participants (Table 4). Women constituted 45.3% of all participants, persons younger than 40 constituted 65.2%, persons with a bachelor's degree or higher 51.4%, wage-employed or self-employed persons 79.7%, persons with household income of \$50,000 or more 43.8%, Democrats 50%, Republicans 20.8%, married persons 33.5%, persons with one or more children 41.5%.

Table 5 reports the means, standard deviations (SD), and Pearson correlation coefficients for SVO and well-being variables. The mean SVO score of 23.883 indicates that the average participant was prosocial. The mean score for total well-being was 6.830. The mean scores for remembered well-being and experienced well-being—the subdomains of total well-being—were 6.846 and 6.656, respectively. In the study by Hervás and Vázquez (2013), those scores were similar for the U.S. sample at 6.93 and 6.32, respectively. With respect to the subdomains of remembered well-being, although the mean scores for general well-being, eudaimonic well-being, and hedonic well-being ranged between about 6.7 and 7.1, the mean score for social well-being was 5.925, deviating downward from the other scores. The SVO was weakly correlated with total well-being, remembered well-being, and hedonic well-being at significance levels of 5%, 5%, and 1%, respectively. Among the correlation coefficients between the SVO and these well-being domains, the coefficient between the SVO and hedonic well-being was the largest at 0.189.

Table 6 reports the distribution of SVO categories traditionally used by many studies. For the sake of comparison, the distributions of SVO categories in two data sets in Murphy et al. (2011) are reported as well. Their sample was students at a European university, and they used the Slider Measure in their second and third experimental sessions. In the present study, the proportion of altruistic participants, prosocial participants, individualistic participants, and competitive participants was 0.5%, 55.7%, 43.9%, and 0%, respectively. This distribution is similar to the distributions in the study by Murphy et al., in which prosocial participants constituted the majority, and individualistic participants constituted the second-largest group. Altruistic and competitive individuals were rare in both studies.

Table 4 Demographic characteristics of participants (N=212)

	N	%
Gender		
Woman	96	45.3%
Man	116	54.7%
Age		
18 - 22	15	7.1%
23 - 29	58	27.4%
30 - 39	65	30.7%
40 - 49	28	13.2%
50 - 59	32	15.1%
60 or more	14	6.6%
Education		
High school diploma	29	13.7%
Some college/No degree	50	23.6%
Associate's degree	24	11.3%
Bachelor's degree	74	34.9%
Master's degree	25	11.8%
Doctoral or professional degree	10	4.7%
Employment		
Employed for wages	141	66.5%
Self-employed	28	13.2%
Unemployed	10	4.8%
Homemaker	10	4.7%
Student	11	5.2%
Retired	5	2.4%
Unable to work	7	3.3%
Household income		
Less than \$30,000	59	27.8%
\$30,000 - \$39,999	29	13.7%
\$40,000 - \$49,999	31	14.6%
\$50,000 - \$59,999	29	13.7%
\$60,000 - \$69,999	16	7.5%
\$70,000 - \$79,999	11	5.2%
\$80,000 - \$89,999	9	4.2%
\$90,000 - \$99,999	5	2.4%
\$100,000 - \$149,999	14	6.6%
\$150,000 or more	9	4.2%
Political party preference		
Democratic	106	50.0%
Republican	44	20.8%
Independent	53	25.0%
Other or decline to answer	9	4.2%
Marital status		
Married	71	33.5%
Widowed	5	2.4%
Divorced	12	5.7%
Separated	3	1.4%
Never married	94	44.3%
Partner in an unmarried couple	27	12.7%
Having one or more children		
Yes	88	41.5%
No	124	58.5%

Table 5 Descriptive statistics and correlations for SVO and well-being variables

	Mean	SD	1	2	3	4	5	6	7
1. SVO	23.883	14.514							
2. Total	6.830	1.810	0.139*						
3. Remembered	6.846	1.819	0.139*	0.996**					
4. General	6.764	1.950	0.074	0.905**	0.904**				
5. Eudaimonic	7.068	1.904	0.132	0.970**	0.978**	0.845**			
6. Hedonic	6.722	2.143	0.189**	0.869**	0.867**	0.724**	0.798**		
7. Social	5.925	2.307	0.076	0.693**	0.691**	0.624**	0.616**	0.480**	
8. Experienced	6.656	2.459	0.094	0.727**	0.667**	0.633**	0.615**	0.627**	0.500**

Table 6 Distributions of SVO categories

	This study	Murphy et al. Session 2	Murphy et al. Session 3
Altruistic	0.5%	0%	0%
Prosocial	55.7%	58%	64%
Individualistic	43.9%	39%	34%
Competitive	0%	3%	2%

Notes: The numbers for the second and third columns of data are taken from Table 1 in Murphy et al. (2011, p. 775).

Now let us look at the main results. Table 7 reports the results of ordinary least-squares regression using SVO as a continuous construct, with the SVO score as an independent variable and with total well-being, remembered well-being, general well-being, eudaimonic well-being, hedonic well-being, social well-being, and experienced well-being as dependent variables. The coefficient of SVO was largest at 0.028 when hedonic well-being was a dependent variable. This means that an increase of 1 in SVO score is associated with an increase of 0.028 in hedonic well-being. The SVO coefficient was about 0.02 when total well-being, remembered well-being, eudaimonic well-being, and experienced well-being were used as dependent variables, and the SVO coefficient was about 0.015 when general well-being and social well-being were used. The SVO coefficient was statistically significant at the 1% level when hedonic well-being was a dependent variable, and it was statistically significant at the 5% level when total well-being, remembered well-being, and eudaimonic well-being were dependent variables.

The coefficients of the other independent variables were generally consistent with the coefficients reported in previous studies. The coefficient of parenthood was largest, 0.672, when eudaimonic well-being was a dependent variable, and it was about 0.6 when total well-being, remembered well-being, and general well-being were dependent variables. With respect to political preferences, the coefficient for Republican supporters, with Democratic supporters as the reference category, was largest, 0.973, when eudaimonic well-being was a dependent variable; it was about 0.9 when total well-being, remembered well-being, and general well-being were dependent variables. These coefficients were statistically significant at the 5% level or at the 1% level.

With respect to household income, the coefficients for the higher income categories were generally positive, with \$30,000 or less as the reference category. For the category of \$70,000 to \$79,999 and the category of \$150,000 or more, the coefficients were high, with values greater than 1. Most of these coefficients were statistically significant at the 5% level or 1% level. In 2016, when this study was conducted, the median household income in the United States was \$59,039 (U.S. Census Bureau 2017). This means that the coefficients of household income were much higher in the income categories that were slightly or extremely above the median income than in the other income categories. With respect to educational degrees, with the category of high school graduate as the reference category, the coefficient for the category of doctoral or professional degree was considerably higher than the coefficients for the other categories.

In order to compare the relative magnitudes of the coefficients, the bottom panel of Table 7 also reports the standardized coefficients. These coefficients indicate how many standard deviations each dependent variable changes when each independent variable increases by one standard deviation. Looking closely at the regressions for eudaimonic and hedonic well-being, we find that the standardized coefficients of SVO are 0.147 and 0.187, respectively. At the same time, the standardized coefficients of the parenthood, \$150,000 or more income, and doctoral or professional degree categories are 0.174, 0.146, and 0.144 in the eudaimonic well-being regression, and 0.124, 0.153, and 0.154 in the hedonic well-being regression. Thus, the effect sizes of SVO on eudaimonic well-being and on hedonic well-being are almost comparable to the effect sizes of parenthood, income, and education.

Table 7 Regression results with a continuous SVO variable

	Total	Remember	General	Eudaimonic	Hedonic	Social	Experience
SVO	0.020 *	0.020 *	0.016 †	0.019 *	0.028 **	0.015	0.021
	(0.009)	(0.009)	(0.009)	(0.009)	(0.011)	(0.010)	(0.013)
Having one or more children	0.580 †	0.595 †	0.600 †	0.672 †	0.538	0.243	0.406
	(0.313)	(0.316)	(0.342)	(0.342)	(0.401)	(0.442)	(0.454)
Political preference (reference = Democratic)							
Republican	0.850 *	0.877 **	0.945 **	0.973 **	0.678 †	0.563	0.552
	(0.329)	(0.332)	(0.354)	(0.334)	(0.408)	(0.450)	(0.434)
Independent	-0.172	-0.141	-0.113	-0.060	-0.285	-0.402	-0.515
	(0.355)	(0.352)	(0.376)	(0.373)	(0.403)	(0.425)	(0.493)
Other/decline to say	-0.012	0.008	-0.083	-0.065	0.406	-0.167	-0.234
	(0.650)	(0.648)	(0.683)	(0.680)	(0.857)	(0.637)	(0.814)
Income (reference = less than \$30,000)							
\$30,000 - \$39,999	0.243	0.261	0.229	0.263	0.452	-0.075	0.052
	(0.454)	(0.451)	(0.464)	(0.463)	(0.567)	(0.592)	(0.649)
\$40,000 - \$49,999	0.062	0.118	-0.067	0.070	0.240	0.527	-0.551
	(0.463)	(0.459)	(0.540)	(0.474)	(0.504)	(0.638)	(0.688)
\$50,000 - \$59,999	0.772 †	0.744	0.555	0.696	0.962 †	0.976 †	1.075 †
	(0.461)	(0.457)	(0.516)	(0.457)	(0.563)	(0.573)	(0.638)
\$60,000 - \$69,999	0.154	0.131	0.017	0.179	0.291	-0.246	0.399
	(0.567)	(0.564)	(0.631)	(0.570)	(0.688)	(0.831)	(0.828)
\$70,000 - \$79,999	1.171 *	1.228 *	1.571 *	1.019 †	1.423 *	1.411 *	0.539
	(0.553)	(0.560)	(0.640)	(0.609)	(0.598)	(0.689)	(0.730)
\$80,000 - \$89,999	0.295	0.364	0.624	0.387	0.542	-0.654	-0.455
	(0.731)	(0.748)	(0.772)	(0.784)	(0.948)	(1.000)	(0.802)
\$90,000 - \$99,999	0.264	0.315	0.310	0.337	-0.502	1.821 *	-0.293
	(1.128)	(1.100)	(1.006)	(1.076)	(1.638)	(0.793)	(1.899)
\$100,000 - \$149,999	-0.101	-0.080	-0.409	-0.109	0.505	-0.417	-0.327
	(0.558)	(0.574)	(0.673)	(0.662)	(0.604)	(0.696)	(0.732)
\$150,000 or more	1.499 **	1.468 **	1.542 *	1.373 **	1.623 *	1.583 *	1.843 **
	(0.476)	(0.478)	(0.604)	(0.468)	(0.631)	(0.708)	(0.661)
Education (reference = High school diploma)							
Some college/No degree	-0.192	-0.172	0.057	-0.377	-0.019	0.297	-0.413
	(0.427)	(0.420)	(0.431)	(0.438)	(0.537)	(0.528)	(0.661)
Associate's degree	0.759	0.745	0.792	0.607	0.789	1.396 †	0.910
	(0.551)	(0.544)	(0.566)	(0.558)	(0.701)	(0.715)	(0.759)
Bachelor's degree	-0.154	-0.200	0.230	-0.464	-0.222	0.566	0.347
	(0.444)	(0.441)	(0.444)	(0.460)	(0.547)	(0.537)	(0.621)
Master's degree	0.512	0.504	0.447	0.303	0.948 †	0.936	0.606
	(0.426)	(0.422)	(0.474)	(0.446)	(0.546)	(0.636)	(0.739)
Doctoral or professional	1.500 **	1.482 **	1.970 **	1.293 *	1.550 *	1.500 †	1.697 *
	(0.487)	(0.501)	(0.530)	(0.598)	(0.731)	(0.874)	(0.734)
(Intercept)	5.827 **	5.859 **	5.604 **	6.514 **	4.520 **	5.115 **	5.481 **
	(0.759)	(0.746)	(0.794)	(0.770)	(0.967)	(1.004)	(1.114)
Standardized coefficients							
SVO	0.159	0.157	0.115	0.147	0.187	0.096	0.123
Having one or more children	0.158	0.162	0.152	0.174	0.124	0.052	0.082
Republican	0.191	0.196	0.197	0.208	0.129	0.099	0.091
\$50,000 - \$59,999	0.147	0.141	0.098	0.126	0.155	0.146	0.151
\$70,000 - \$79,999	0.144	0.150	0.179	0.119	0.148	0.136	0.049
\$150,000 or more	0.167	0.163	0.160	0.146	0.153	0.139	0.151
Master's degree	0.092	0.090	0.074	0.051	0.143	0.131	0.080
Doctoral or professional	0.176	0.173	0.215	0.144	0.154	0.138	0.147
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R2	0.083	0.088	0.066	0.093	0.072	0.041	0.024

** p < 0.01; * p < 0.05; † p < 0.1. N=212. Robust standard errors are in parentheses.

Most previous studies treat SVO as a categorical variable. So for the sake of comparison and to provide a robustness check, Table 8 reports the results of ordinary least-squares regression with the categorical SVO variable as an independent variable. Using the four traditional SVO typologies, the number of observations for the altruistic group in our sample was 1 (0.5%), and the number of observations for the competitive group was 0 (Table 6). For the sake of convenience, a respondent in the altruistic group was included in the prosocial group. We use a dummy variable that takes 1 if each individual is prosocial and 0 if each individual is individualistic.

Looking at the results, we find that the coefficients of all variables except SVO and the adjusted R-squared values were almost the same as when the continuous SVO variable was used. The unstandardized coefficient of SVO was 0.833 in the hedonic well-being regression, 0.725 in the experienced well-being regression, and 0.568 in the eudaimonic well-being regression. This means that when each individual is prosocial, each well-being score is greater by the magnitude of the coefficient than the well-being score when each individual is individualistic. In the case of the experienced well-being regressions, the coefficient of the continuous SVO variable was not statistically significant. But the coefficient of the categorical SVO variable was statistically significant. Looking at the standardized coefficient of the categorical SVO variable in each regression, we find little difference between the SVO variable when it is continuous and when it is categorical.

Table 8 Regression results with a categorical SVO variable

	Total	Remember	General	Eudaimonic	Hedonic	Social	Experience
SVO	0.579 *	0.566 *	0.428	0.568 *	0.833 **	0.294	0.725 *
	(0.255)	(0.254)	(0.267)	(0.268)	(0.306)	(0.327)	(0.367)
Having one or more children	0.589 †	0.605 †	0.608 †	0.681 *	0.549	0.256	0.411
	(0.314)	(0.318)	(0.343)	(0.344)	(0.402)	(0.443)	(0.450)
Political preference (reference = Democratic)							
Republican	0.815 *	0.841 *	0.916 **	0.939 **	0.631	0.527	0.523
	(0.325)	(0.328)	(0.351)	(0.331)	(0.402)	(0.452)	(0.425)
Independent	-0.160	-0.129	-0.102	-0.048	-0.269	-0.387	-0.506
	(0.355)	(0.352)	(0.377)	(0.373)	(0.404)	(0.424)	(0.493)
Other/decline to say	0.064	0.083	-0.024	0.009	0.512	-0.112	-0.152
	(0.627)	(0.627)	(0.669)	(0.656)	(0.835)	(0.634)	(0.789)
Income (reference = less than \$30,000)							
\$30,000 - \$39,999	0.218	0.234	0.204	0.240	0.423	-0.125	0.050
	(0.451)	(0.448)	(0.460)	(0.461)	(0.559)	(0.592)	(0.643)
\$40,000 - \$49,999	0.046	0.103	-0.077	0.055	0.215	0.528	-0.578
	(0.462)	(0.458)	(0.540)	(0.473)	(0.501)	(0.641)	(0.683)
\$50,000 - \$59,999	0.786 †	0.759 †	0.566	0.710	0.982 †	0.989 †	1.089 †
	(0.458)	(0.454)	(0.513)	(0.453)	(0.559)	(0.575)	(0.642)
\$60,000 - \$69,999	0.082	0.060	-0.037	0.109	0.188	-0.290	0.315
	(0.568)	(0.567)	(0.633)	(0.572)	(0.693)	(0.825)	(0.820)
\$70,000 - \$79,999	1.137 *	1.193 *	1.540 *	0.987	1.381 *	1.357 *	0.526
	(0.548)	(0.555)	(0.637)	(0.604)	(0.591)	(0.684)	(0.722)
\$80,000 - \$89,999	0.211	0.278	0.555	0.306	0.429	-0.740	-0.527
	(0.729)	(0.746)	(0.770)	(0.781)	(0.942)	(0.980)	(0.789)
\$90,000 - \$99,999	0.438	0.486	0.441	0.507	-0.254	1.924 *	-0.087
	(1.139)	(1.110)	(1.021)	(1.083)	(1.655)	(0.818)	(1.904)
\$100,000 - \$149,999	-0.125	-0.104	-0.427	-0.133	0.470	-0.425	-0.361
	(0.562)	(0.579)	(0.678)	(0.666)	(0.599)	(0.705)	(0.727)
\$150,000 or more	1.487 **	1.456 **	1.531 *	1.361 **	1.608 *	1.568 *	1.834 **
	(0.486)	(0.487)	(0.622)	(0.468)	(0.641)	(0.725)	(0.679)
Education (reference = High school diploma)							
Some college/No degree	-0.185	-0.164	0.063	-0.370	-0.010	0.306	-0.409
	(0.423)	(0.418)	(0.427)	(0.435)	(0.535)	(0.531)	(0.653)
Associate's degree	0.782	0.767	0.808	0.629	0.822	1.402 †	0.943
	(0.552)	(0.544)	(0.565)	(0.558)	(0.704)	(0.712)	(0.759)
Bachelor's degree	-0.161	-0.207	0.223	-0.470	-0.229	0.550	0.347
	(0.444)	(0.441)	(0.443)	(0.460)	(0.546)	(0.542)	(0.614)
Master's degree	0.509	0.502	0.448	0.298	0.938 †	0.959	0.582
	(0.426)	(0.422)	(0.472)	(0.446)	(0.548)	(0.638)	(0.735)
Doctoral or professional	1.405 **	1.386 **	1.892 **	1.202 *	1.423 †	1.405	1.615 *
	(0.491)	(0.507)	(0.523)	(0.603)	(0.740)	(0.886)	(0.723)
(Intercept)	5.962 **	5.998 **	5.722 **	6.643 **	4.695 **	5.292 **	5.567 **
	(0.755)	(0.740)	(0.786)	(0.762)	(0.964)	(0.993)	(1.127)
Standardized coefficients							
SVO	0.159	0.155	0.109	0.148	0.193	0.063	0.147
Having one or more children	0.161	0.164	0.154	0.177	0.127	0.055	0.083
Republican	0.183	0.188	0.191	0.200	0.120	0.093	0.086
\$50,000 - \$59,999	0.150	0.144	0.100	0.128	0.158	0.148	0.153
\$70,000 - \$79,999	0.140	0.146	0.176	0.115	0.143	0.131	0.048
\$150,000 or more	0.166	0.162	0.159	0.144	0.152	0.137	0.151
Master's degree	0.091	0.089	0.074	0.051	0.142	0.134	0.076
Doctoral or professional	0.165	0.162	0.206	0.134	0.141	0.129	0.140
Control variables							
Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R2	0.084	0.087	0.064	0.094	0.076	0.036	0.031

** p < 0.01; * p < 0.05; † p < 0.1. N=212. Robust standard errors are in parentheses.

5 Conclusions and Discussion

We measured prosociality by SVO scores and examined the correlations between prosociality and various aspects of well-being. Regression analysis showed that the effect sizes of SVO on each aspect of happiness were similar to the effect sizes of important determinants of happiness: parenthood, income, and education. For eudaimonic and hedonic well-being, the effect sizes of SVO were 0.15 and 0.19, respectively.

One limitation of this study is that it confirmed only a correlation between prosociality and happiness, not also a causal relationship between them. Although we used SVO as a measure of prosociality, SVO pertains to only one aspect, and there are other ways to measure prosociality, such as social mindfulness (Van Doesum et al. 2021). It is unclear whether we would obtain similar results by using different measures. Moreover, this study is based on a survey of adults in the United States, and data from other countries are necessary for the sake of external validity. We hope to see studies that overcome these limitations by using the present study as a starting point.

One possible and promising extension of this paper would entail analyzing SVO into two components: personality traits and motivational states (Ackermann et al. 2016). It would be interesting to examine which component is more strongly linked to well-being. We may be able to learn useful implications for education and labor policies by investigating the extent to which SVO varies with differences in education and in work environments. Can we develop the personal trait component of SVO by education and the motivational state component of SVO by creating a work environment that encourages cooperation?

In order to derive policy implications from this study, further research on the relationship between social preferences and well-being is necessary. However, in light of the fact that prosociality is correlated with happiness in a magnitude comparable to the magnitudes of such factors as parenthood and income, we may need to reassess the importance of developing prosociality in educational policies. It seems obvious that being prosocial would lead to happiness, and the educational policies of many countries have indeed made development of prosociality one of their priorities. The question is whether such cultivation of prosociality is superficial or substantive. We need to think about how to nurture prosociality at home and school.

Acknowledgements. The author thanks Robert J. MacCoun, Shozo Ota, and the participants of a seminar held at Harvard University in 2020.

Research funding. This work was supported by the New Faculty Startup Fund of Seoul National University and the 2022 Research Fund of the Seoul National University Asia-Pacific Law Institute, donated by the Seoul National University Law Foundation.

Conflicts of interest. The author has no conflicts of interest to disclose.

Human rights and animal rights. The study was conducted in accordance with the ethical standards of the 1964 Declaration of Helsinki and those of the author's institution.

Informed consent. The author obtained informed consent from all participants in the study.

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