Influencing value priorities and increasing well-being: The effects of reflecting on intrinsic values

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A four-week experimental study ($N = 113$) examined the effects of reflecting on intrinsic values. In the experimental group, participants learned about the distinction between intrinsic (e.g. having close relationships) and extrinsic (e.g. being popular) values, wrote about two personal intrinsic values, and then reflected on these values weekly for four weeks. In the control group, participants completed parallel exercises related to the daily details of their lives. Results revealed that participants in the intrinsic values group experienced greater well-being immediately following the written reflection than participants in the control group. Four weeks later, the more engaged participants felt in the reflection exercises, the more they prioritized intrinsic over extrinsic values and the greater their well-being. These effects occurred only for participants in the intrinsic values condition. The implications for changing value priorities and improving well-being are discussed.

Keywords: intrinsic and extrinsic values; value change; values intervention; well-being

Introduction

Can individuals change their value priorities by taking the time to reflect on what is important to them and focusing on intrinsic pursuits such as forming close relationships and self-development rather than extrinsic pursuits such as becoming popular and wealthy? This question has not been addressed empirically but its answer may have implications for peoples' quality of life given that a substantial body of research suggests that the well-being individuals experience is related to the types of values they prioritize. In this article, we tested whether inviting university students to reflect on and write about their intrinsic values would lead to changes in their value priorities and consequently, increases in their well-being.

How happy and vital individuals feel is associated with the values that they prioritize. Drawing from humanistic theories (Maslow, 1954; Rogers, 1964), self-determination theory proposes that human beings are growth-oriented and that a focus on values that support their needs results in greater well-being and self-actualization (Kasser, 2002a). Self-determination theorists have distinguished the content of values and goals as either intrinsic or extrinsic (Kasser, 2002a; Kasser & Ryan, 1993, 1996). People differ in the degree to which they place importance on intrinsic versus extrinsic pursuits. Intrinsic values, such as striving to

help others, are thought to be expressive of natural growth tendencies, whereas extrinsic, materialistic values, such as striving for popularity, depend on the contingent reaction of others and are typically engaged in as a means to an end. Researchers have confirmed the categorization of values into intrinsic and extrinsic pursuits, demonstrating across 15 countries, that values are organized in a circumplex structure (Grouzet et al., 2005). In such a circular structure, some values are compatible with each other and some values are in conflict with each other. Thus, intrinsic values tend to group together and to oppose extrinsic values. The intrinsic/extrinsic distinction allows researchers to look at centrality (Rokeach, 1973), the idea that values are organized in a system where some are prioritized over others.

A substantial body of research has demonstrated that prioritizing intrinsic over extrinsic values is associated with greater well-being, as measured by self-report and clinical interviews of individuals' vitality, social functioning, depression, anxiety, and physical ailments (see Kasser, 2002b for a review). The link between intrinsic value priorities and well-being has been found among adolescents (Lekes, Gingras, Philippe, Koestner, & Fang, 2010), university students (Kasser & Ryan 1993, 1996), working adults (Vansteenkiste et al., 2007), and older adults

(Sheldon & Kasser, 2001). In addition to North American samples, the link has been shown in different nations including Russia (Ryan et al., 1999), Germany (Schmuck, Kasser, & Ryan, 2000), Korea (Kim, Kasser, & Lee, 2003), and China (Lekes et al., 2010). Intrinsic and extrinsic values are thought to relate differently to well-being because of how they differ in the degree to which they satisfy individuals' basic needs for autonomy (feeling volitional and authentic in one's actions), relatedness (feeling connected and cared for), and competence (feeling effective and efficacious) (Deci & Ryan, 2000; Kasser, 2002a). Intrinsic values are congruent with the psychological needs for autonomy, relatedness, and competence while extrinsic values are associated with a lack of psychological need fulfillment.

The majority of research on intrinsic versus extrinsic values and well-being has been conducted using cross-sectional designs and correlational analyses. However, a few recent studies have used prospective and experimental designs. In a one-year longitudinal study, Niemiec, Ryan, and Deci (2009) found that change in the attainment of post-college students' intrinsic values related to change in well-being. Furthermore, the relationship was mediated by psychological need satisfaction, as predicted by self-determination theory. The most direct test of the causal role of intrinsic pursuits in promoting well-being came from a recent study by Sheldon, Gunz, Nichols, and Ferguson (2010). Participants were randomly assigned to pursue either three extrinsic goals (e.g. enhance your name recognition or popularity, find a way to earn some extra money) or three intrinsic goals (e.g. get to know someone beyond a superficial level, join a volunteer organization). The researchers asked participants to rate their goal progress after two and four weeks and found that intrinsic, but not extrinsic, goal attainment was related to changes in well-being. These results occurred regardless of participants' original intrinsic versus extrinsic value orientations.

This recent work on the relationship between well-being and assigned intrinsic versus extrinsic goals leads to the following question: Is it possible to encourage shifts in personal intrinsic value priorities, thereby improving individuals' well-being? Values are enduring beliefs that some goals are preferable to others (Allport, 1961; Rokeach, 1973) and they are thought to guide peoples' attitudes, emotions, and behavior (Kasser, 2002a), to transcend specific situations (Rokeach, 1973), and to persist over time, influencing an individual's life for years and decades (Roberts & Robins, 2000). Researchers have noted that values are a poorly studied area in the field of psychology (P. Cohen & J. Cohen, 1996; Kasser, 2002a; Rokeach, 1973) and that value change is a neglected topic (Bardi, Lee, Hofmann-Towfigh, & Soutar, 2009; Maio, Pakizeh, Cheung, & Rees, 2009). This is in part

because values are viewed as stable in nature, yet many researchers have remarked on their malleability (Kasser, 2002b; Rokeach, 1973; Schwartz 1997).

Moreover, there is evidence that values change over time and following certain life events. Peoples' values have been shown to change following traumatic events (Verkasalo, Goodwin, & Bezmenova, 2006), changes in political system (Danis, Liu, & Vacek, 2011), and educational experiences (Sheldon & Krieger, 2004). There is also evidence to show that overall peoples' value priorities change over time, in the direction of more intrinsically oriented pursuits. In a sample of 17- to 82-year-olds, older individuals' values tended to be more intrinsically oriented (Sheldon & Kasser, 2001) and over the course of university, young people prioritized intrinsic values to a greater extent (Sheldon, 2005). Sheldon and colleagues have further shown that individuals tend to shift toward intrinsic values and away from extrinsic values when asked to remember and revise previous value ratings (Sheldon, Arndt, & Houser-Marko, 2003). The researchers suggested that their findings provide evidence for an organismic valuing process (Rogers, 1964), in which individuals have an innate awareness of the values and goals that are likely to benefit their well-being. Thus, values change over time, following life events and experiences, suggesting that value priorities may be susceptible to direct attempts at influencing them.

Researchers have tried various strategies to bring about changes in values. In a recent series of studies, researchers primed certain values and found that participants increased behaviors congruent with the primed values (Maio et al., 2009). Another method of inducing value change is value self-confrontation, developed by Rokeach (1973), in which individuals' values are challenged by presenting them with information on the values, attitudes, and behaviors of a positive reference group. Rokeach explained that individuals may become dissatisfied with themselves when they realize that they would like to hold different attitudes and values or behave differently, thereby fostering change in values. Studies using the value self-confrontation method have produced change in participants' values, such as placing greater priority on protecting the environment (Grube, Mayton, & Ball-Rokeach, 1994) and on accruing wisdom (Schwartz & Inbar-Saban, 1988). In a recent study, value self-confrontation led to change in targeted values, as well as change in other values with similar and opposing underlying motives, providing support for circumplex models of values, in which values group together based on their motivational aims (see Experiment 1, Maio et al., 2009). For example, the authors found that participants in the condition that prioritized self-transcendence values increased their self-transcendent

values and decreased their self-enhancement values, compared to participants in the control condition.

Rather than influence value priorities indirectly or by making individuals feel unhappy with themselves, in this study, we sought to create an opportunity for individuals to learn about the research distinguishing intrinsic from extrinsic values and to reflect on their personal intrinsic values. Recently, Bardi and Goodwin (2011) proposed a model in which values change by both automatic and effortful routes. We developed our intervention based on the idea that greater understanding and self-reflection, an effortful route, could influence value priorities. This is in line with Kasser's (2002b) suggestions for making personal change in values. He explains that individuals might change by first contemplating the research findings linking well-being and value priorities and that they may then reflect on the reasons behind their value priorities as well as how they developed. As mentioned earlier, researchers have shown that over time, values tend to naturally shift toward more intrinsic priorities, providing some evidence for an organismic valuing process (Sheldon et al., 2003). We hoped to facilitate this shift by encouraging individuals to reflect on their intrinsic values. As Rogers (1964) explained, adults tend to lose touch with their organismic valuing process and instead take in the value patterns of others and society. We chose to focus on intrinsic values, given that these have been shown to be congruent with individuals' psychological needs and related to their well-being (Kasser, 2002b; Niemiec et al., 2009). We encouraged participants to identify personally meaningful intrinsic values and reflect on their importance, the role they play in their lives, and experiences highlighting the values. It is this manner of reflecting on experience that Rogers (1964) suggested could bring individuals into contact with their true values, the ones that make them feel more complete and developed.

Given that individuals have both intrinsic and extrinsic values (Kasser, 2002a) and that it is the centrality of individuals' values that is important (Rokeach, 1973), we hoped to encourage individuals to prioritize intrinsic over extrinsic values by reflecting on and writing about personally meaningful intrinsic values. Research suggests that moving toward intrinsic values may be more important for well-being than moving away from extrinsic values (Sheldon, 2005). Recent research further indicates that when values change, compatible values change in the same direction and conflicting values change in the opposite direction (Bardi et al., 2009; Maio et al., 2009). Thus, by encouraging a greater focus on intrinsic values, extrinsic values should also be affected. Indeed, based on circumplex model of values, Kasser (2011) suggests focusing on alternate values as a strategy for

reducing materialistic, extrinsic values, which are related to ecologically destructive behavior.

In order to establish that reflecting on intrinsic values can promote well-being, several experimental factors must be considered. Most importantly, the impact of experimental procedures aimed at intrinsic values must be compared with a control condition that encourages reflection on some distinct set of concerns that would conceivably be seen as relating to well-being. We follow Sheldon and Lyubomirsky's (2006) use of a 'life details' reflection exercise as a control condition. Participants in the control group completed a set of exercises designed to parallel those in the experimental condition; they were asked to read about, reflect on and write about the 'ordinary details' of their lives, such as their daily routine and activities. They also received the parallel information about how a focus on life details may be beneficial to well-being. There is not a body of evidence to support this claim as exists with the experimental condition. To make it seem plausible, we suggested that people in modern societies tend to lead fast-paced lives, not taking the time to stop and think about their daily routine and that stopping to think about their daily activities may help individuals to better identify areas of concern in their lives and to experience greater well-being and happiness. This was important in controlling for expectancy effects, i.e. whether individuals rate their well-being higher simply because they were told that the exercises would lead to greater well-being.

To further control for possible biases in responding, we included a measure of individual differences in the tendency to respond in a socially desirable way. There is a danger that participants in the experimental condition may shift toward more intrinsic values not because of any meaningful change resulting from a process of reflection, but rather because the intrinsic values are viewed as more socially desirable. The social desirability measure was used as a covariate when considering the impact of the experimental condition versus the control condition on change in value priorities and well-being.

Given the findings that intrinsic values have been shown to increase during university (Sheldon, 2005), but that some educational experiences may lead to a decrease in intrinsic values (Sheldon & Krieger, 2004), university students seemed to be an appropriate population to explore the effects of a reflection exercise on values. This period of life, labeled emerging adulthood by Arnett (2000), has been highlighted as an important time for interventions fostering positive development (O'Connor et al., 2011). Beginning in late adolescence, individuals are focused on discovering the meaning of their lives and their place in the world (Piaget, 1967), making young adulthood a natural time to reflect on values.

Present study

A four-week experimental study was conducted to examine the effect of a values reflection exercise on well-being and changes in value priorities among university students. We had four main hypotheses. We expected participants who learned about intrinsic and extrinsic values and spent 20 min writing about their intrinsic values to experience greater well-being immediately following the activity compared to participants in the control group, who learned and wrote about life details (Hypothesis 1). We expected the written reflection to sufficiently engage participants, whereas follow-up effects on well-being would depend on how engaged they felt while reflecting during the weeks that followed the main exercise. We hypothesized that four weeks following the writing activity, during which time they were encouraged to continue reflecting on their values, participants in the intrinsic values group would be more likely to prioritize intrinsic over extrinsic values than participants in the control group (Hypothesis 2). We expected that this finding would occur particularly for participants who were fully engaged in the process of reflecting on their values. Similarly, we expected that the more the participants felt engaged in the process of reflecting on their intrinsic values, the more they would maintain benefits to their well-being (Hypothesis 3). Level of engagement in the reflection exercises about life details was not expected to relate to changes in either values or well-being. Finally, we expected that changes in the degree to which participants prioritized intrinsic over extrinsic values would mediate the relationship between engagement in reflecting on intrinsic values and well-being (Hypothesis 4).

Method

Participants and procedure

University undergraduates were recruited through an extra credit program, in which psychology students can earn two extra credits for participating in a research study, and through classified ads, targeted at students from all departments. Students were invited to participate in the 'Looking in the mirror: Reflecting on life study', in which they would be asked to complete questionnaires on their feelings and values and reflect on their lives through a writing exercise. The initial sample consisted of 113 participants (87 women and 26 men) and 104 completed the follow-up questionnaires after 4 weeks. Participants' age ranged from 17 to 25 years with a mean of 19.79. Sixty-six percent of participants were Caucasian, 27% were Asian, and 3% were Black/African Canadian.

Initially, participants attended small-group laboratory sessions in which they were randomly assigned to one of two conditions: an intrinsic values group or a life details (control) group. During this session, they responded to questionnaires on their values and well being, completed an exercise which differed for each group, and then completed the same well-being questionnaires, as well as a social desirability scale. Over the next four weeks, participants were e-mailed a reflection question each week and asked to provide a short response. Participants were assured of the confidentiality of their responses. At the end of four weeks, they were emailed a link to an online survey, in which they again completed the values and well-being questionnaires, as well as a measure of the degree to which they had felt engaged in the study activities. They were then sent a debriefing form and compensated either with two course credits or a payment of 20 dollars.

Exercises

In both the intrinsic values and the control group, participants read about a topic (values or life details), answered questions based on what they had learned from the reading, and then did a written reflection exercise for approximately 20 min. The weekly emails were brief, containing two quotes, a reminder of what they had written about, and a question to answer in a reply email. The exercises for the two groups were matched in both length and format.

Intrinsic values

Participants first read a text that began with a definition of values and a description of the distinction between intrinsic and extrinsic values. To ensure that they actively read the text, participants were asked to circle the intrinsic values from a list of both intrinsic and extrinsic values. They were then asked to read a series of quotes and circle the ones reflecting intrinsic values. Participants were then informed that individuals who prioritize intrinsic over extrinsic values tend to experience greater well-being and were provided with a rationale for the connection between values and well-being.

Next, participants were asked to read over a list of 13 different intrinsic values and select the two most important to them. Examples included 'having close and supportive friends', 'devoting time for personal growth and development', and 'helping your community through volunteer work'. Participants were informed that they would be writing about these values and were invited to adapt or rephrase them to suit their personal values. Participants then reflected on the importance of their two selected values in a 15–20 min writing exercise. Specifically, they were asked to describe why these values were important to them, personal experiences highlighting these values, how these values were incorporated in their life, and

why they were more important to them than other values.

Participants were encouraged to continue reflecting on their intrinsic values. Over the next four weeks, they received an e-mail each week, with two quotes reflecting intrinsic values, a reminder of their two values, and a reflective question. The study materials are available upon request.

Life details

Following Sheldon and Lyubormirsky's (2006) use of a 'life details' exercise, control group participants completed a parallel set of exercises, in which they were asked to read about, reflect on, and write about the 'ordinary details' of their lives, such as their daily routine and activities. As in the intrinsic values condition, the text stated that paying attention to life details was beneficial to well-being. For the reflection activity, participants chose two personal life details from a list of 13 activities, including 'going out to a movie', 'exercising', 'cleaning your living space', and 'cooking dinner'. Participants were instructed to take 15–20 min to describe how each activity fit into their larger routine, how often they engaged in these activities, where they did them, and with whom they did them. The e-mails mirrored those sent to the values participants, including two quotes about daily routine, a reminder of their two life details, and a question about their daily routine.

Measures

Well-being

To capture the two approaches in measuring well-being, hedonic, focusing on happiness, and eudaimonic, focusing on the degree to which a person is fully functioning (Ryan & Deci, 2001), we measured participants' affect and their vitality. On the affect scale (Emmons, 1992), respondents indicated the extent to which they felt a series of four positive (joyful, enjoyment/fun, pleased, and happy) and five negative (unhappy, worried/anxious, depressed, angry/hostile, and frustrated) emotions. On the vitality scale (Ryan & Frederick, 1997), they responded to seven statements reflecting the feeling of being alive and alert, such as 'I feel alive and vital'. Vitality has been proposed as an important component of personal well-being (Bostic, Rubio, & Hood, 2000; Peterson & Seligman, 2004). Before and after the lab session exercise, participants were asked about how they felt at that moment, in order to assess their immediate feelings. On the online survey, 4 weeks later, they were asked about how they had felt over the past week, to get a more enduring assessment of well-being. The well-being scales have been validated (Bostic et al., 2000; Diener & Emmons,

1984). Good internal reliabilities of $\alpha > 0.85$ were obtained in our sample.

The positive and negative affect scales were highly negatively correlated with each other (rs ranging from -0.38 to -0.47). We therefore computed an affect balance score at each time point by subtracting participants' mean negative affect score from their positive affect score. This procedure has been used in previous studies (Koestner, Lekes, Powers, & Chicoine, 2002).

Values

A shortened version of the Aspiration Index (Kasser & Ryan, 1996) was used to measure participants' intrinsic and extrinsic values. Participants were asked to rate the importance of 18 long-term aspirations on a scale of 1 (not at all) to 7 (very much). Intrinsic values included: 'to have committed, intimate relationships', 'to work to make the world a better place', and 'to grow and learn new things'. Extrinsic values included: 'to be famous', 'to have enough money to buy everything you want'; and 'to have an image that others find appealing'. Acceptable internal reliabilities of $\alpha > 0.75$ were obtained for both the intrinsic and extrinsic aspiration scales. Following the methodology of Sheldon and Kasser (1995, 2001, 2008), we calculated an index of intrinsic relative to extrinsic values by subtracting the mean extrinsic rating from the mean intrinsic rating. This values index is in line with previous findings in which extrinsic values have been found to be detrimental when they are strongly pursued, above more intrinsic pursuits (Kasser, 2002a).

Social desirability

Participants responded to a 13-item version (Reynolds, 1982) of the Marlowe–Crowne Social Desirability Scale (Crowne & Marlowe, 1960), in which they answered true or false to statements designed to tap a social desirability bias. In a cross-validation of the shorter scale, Zook and Sipps (1985) found that it could be administered instead of the original 33-item scale without significant loss of reliability.

Exercise engagement

To assess the degree to which participants felt engaged in the exercises (on values or life details), we followed Heslin, Latham, and VandeWalle's (2005) measurement of response to a workshop. At the end of the online survey, we requested participants' feedback on their experience taking part in the study. On a scale 1 (strongly disagree) to 7 (strongly agree), they were asked to rate the degree to which they found reflecting on their intrinsic values or thinking about their life details (depending on the condition) to be

'thought-provoking', 'insightful', 'helpful', and 'worthwhile'.[1] This scale had acceptable internal consistency, $\alpha = 0.80$.

To examine the concurrent validity of the self-reported measure of engagement, we made use of the narrative material that participants provided in the fourth on-line exercise. Specifically, the second author coded each participant's response for number of words and depth of engagement (1–4 scale). The responses included a mean of 182 words and an average depth rating of 3.24. Depth and number of words were highly correlated, $r = 0.75$; therefore, we combined them into one variable. Self-reported engagement in the exercise was significantly related to our coded measure of engagement, $r = 0.20$, $p < 0.05$.

Results

Preliminary analyses

The measures of affect balance and vitality were highly related to each other, with the correlations ranging from 0.69 to 0.76, and a mean correlation of $r = 0.73$. Because of these high correlations, we created a well-being index by computing the mean of participants' affect balance and vitality scores at each time point. We tested for effects of sex of participants for all outcome variables and found no mean differences or interaction effects for condition approaching significance ($ps > 0.10$); therefore, sex is not included in the main analyses.

Table 1 presents the means, standard deviations, and correlations for all of the variables in the study. The mean for the values index (intrinsic relative to extrinsic values) indicates that, on average, participants rated intrinsic values more than two points higher (on a 1–7 scale) than extrinsic values. The relative emphasis on intrinsic values is consistent with previous research (Kasser, 2002a). Well-being was significantly lower at baseline than at the four-week follow-up, $t(101) = -2.16$, $p < 0.05$. The correlations revealed high levels of stability over time for both the values index and the well-being measure. Social desirability was significantly positively related to both the values index and

well-being, highlighting the importance of controlling for this individual difference variable.

There were no differences between the conditions in the degree to which they felt engaged in the exercises, $t(102) = 0.56$, n.s. There were also no differences between conditions on the coded depth of engagement or in the number of words that they used, $ps > 0.25$. These findings suggest that engagement was a relevant variable in both conditions. Correlational analyses revealed that engagement was unrelated to baseline levels of well-being and values, $rs = -0.08$ and -0.01, respectively. Together, these results suggest that engagement represents an emergent process that was unrelated to condition and to baseline functioning.

The nine participants who dropped out of the experiment were compared with the 104 who completed it. No between-group differences approaching significance were obtained for any of the baseline measures ($ps > 0.10$).

Central analyses

To test our first hypothesis, that participants in the intrinsic values condition would experience greater well-being immediately following the reflection exercise than participants in the control condition, a hierarchical multiple regression analysis was performed with participants' well-being at the end of the lab session as the dependent variable. The first set of predictors was their baseline values index, social desirability, and well-being. Condition was entered next followed by the interaction of baseline values and condition. All predictors were standardized before entry in the regression equation. The interaction term was created by calculating the product. The predictors accounted for a multiple R of 0.83, $R^2 = 0.70$, $F(5, 105) = 51.39$, $p < 0.0001$. Baseline well-being was highly related to well-being at the end of the session, $\beta = 0.78$, $p < 0.0001$. Baseline values were unrelated to well-being at the end of the session, $\beta = 0.04$, n.s., whereas social desirability was marginally related to reporting enhanced well-being, $\beta = 0.11$, $p = 0.06$. Condition was significantly positively related to well-being at the end

Table 1. Means, standard deviations, and correlations for all variables.

	M	SD	1	2	3	4	5	6	7
1. Values index baseline	2.27	1.11	–						
2. Social desirability	5.83	2.54	0.27**	–					
3. Well-being baseline	3.01	1.56	0.09	0.36**	–				
4. Well-being post lab Session	3.43	1.47	0.14	0.40**	0.82**	–			
5. Well-being at 4 weeks	3.39	1.50	0.25*	0.32**	0.43**	0.49**	–		
6. Values index at 4 weeks	2.39	1.30	0.79**	0.19	0.14	0.20*	0.34**	–	
7. Engagement in exercises	5.24	1.03	−0.01	−0.02	−0.08	0.11	0.17	0.18	–

Note: *$p < 0.05$ and **$p < 0.01$.

of the first session, $\beta = -0.12$, $t = -2.27$, $p < 0.05$. As hypothesized, participants in the experimental condition reported greater well-being than participants in the control condition, after controlling for baseline levels of well-being, values, and social desirability. Specifically, the mean rating of well-being for experimental participants was 3.59 compared to a mean of 3.23 for control participants. The two-way interaction of baseline values and condition did not approach significance, $\beta = -0.06$, n.s.

Our second hypothesis was that at the four-week assessment, participants in the intrinsic values group would be more likely to prioritize intrinsic over extrinsic values than participants in the control group. However, we expected that these findings would occur only for participants who felt engaged in the process of reflecting on their values over the four weeks of the study. A hierarchical multiple regression analysis was performed with participants' values index at the four-week assessment as the dependent variable. The first set of predictors was their baseline values index and social desirability. Condition and exercise engagement were entered next, followed by the interactions of condition by initial values, initial values by exercise engagement, and condition by exercise engagement. Finally, the three-way interaction of initial values, condition, and engagement was entered. All predictors were standardized before entry in the regression equation. The interaction terms were created by calculating products. The predictors accounted for a multiple R of 0.80, $R^2 = 0.64$, $F (8,93) = 20.45$, $p < 0.0001$. Table 2 shows the standardized regression effects for each of the predictor variables at the point they were entered in the regression equation. It can be seen that the baseline values index was highly related to the later values index. Condition was unrelated to values but level of engagement was significantly positively related. There was no interaction between initial values and condition or between initial values and engagement, but, as expected, the interaction of

condition and level of exercise engagement significantly predicted the later values index. The three-way interaction was non significant. To understand the condition × engagement interaction, we repeated the regression analyses separately for participants in the intrinsic values and control conditions. These analyses revealed that in the intrinsic values condition, there was a significant positive relation between engagement in the intervention and high prioritization of intrinsic over extrinsic values at four weeks, $\beta = 0.39$, $p < 0.001$. There was no relation between exercise engagement and week 4 values index in the control condition, $\beta = 0.01$, n.s.

Our third hypothesis was that the more experimental participants felt engaged in the process of writing about and reflecting on their intrinsic values, the more they would maintain benefits to their well-being. No such benefits were expected for control participants who wrote about life details. A hierarchical multiple regression analysis was performed with well-being at four weeks as the dependent variable. The first set of predictors included baseline well-being, baseline values index, and social desirability. Condition was entered next followed by exercise engagement. The interactions of condition by initial values, initial values by exercise engagement, and condition by exercise engagement were entered next. The three-way interaction of condition, initial values, and engagement was entered last. The predictors accounted for a multiple R of 0.59, $R^2 = 0.28$, $F (8,93) = 6.16$, $p < 0.001$. Table 2 shows the standardized regression effects for each of the predictor variables at the point they were entered in the regression equation. It can be seen that baseline well-being was significantly positively related to four-week well-being. The baseline values index was marginally related to later well-being. Condition was unrelated to well-being but level of exercise engagement was significantly positively related. The interaction of condition with baseline values was nonsignificant. The interaction of baseline values with engagement was

Table 2. Standardized regression coefficients and *t*-tests for values index and well-being at 4 weeks.

	Values index at 4 weeks		Well-being at 4 weeks	
	β	*t*-test	β	*t*-test
Well-being baseline	0.04	0.50	0.35**	3.67
Values index baseline	0.74**	10.57	0.17[#]	1.82
Social desirability	0.00	0.19	0.13	1.34
Condition (1 = experimental/0 = control)	−0.10	−1.43	0.00	0.03
Engagement	0.19**	2.92	0.20*	2.26
Condition × values index baseline	0.04	0.58	−0.07	0.91
Engagement × values index baseline	−0.04	−0.39	−0.19*	−2.15
Condition × engagement	−0.20**	−3.13	−0.18*	−2.01
Condition × values × engagement	0.08	1.29	0.03	0.33

Note: **$p < 0.01$; *$p < 0.05$; and #$p < 0.10$.

significant. This finding indicates that participants who were relatively more extrinsic in their values at baseline and who engaged more in an exercise, regardless of what type (experimental or control), experienced greater well-being at four weeks. The interaction that we were interested in was condition by level of engagement. As expected, it was significantly positively related to well-being at four weeks. The three-way interaction was nonsignificant. To understand the condition x engagement interaction, we repeated the regression analyses separately for participants in the control and experimental conditions. These analyses revealed that in the intrinsic values condition there was a significant positive relation between exercise engagement and improvement in well-being, $\beta = 0.39$, $p < 0.001$. There was no relation between engagement and improved well-being in the control condition, $\beta = 0.02$, n.s.[2]

Our final hypothesis was that there would be a mediational link for participants in the intrinsic values condition such that the degree to which participants prioritized intrinsic over extrinsic values would mediate the relationship between engagement in the exercises and well-being. To test this mediation hypothesis, a multiple-group path analysis was conducted in Lisrel 8.8. The mediation engagement $\rightarrow$ increases in intrinsic value priorities $\rightarrow$ increases in well-being was tested for each experimental condition and compared with one another (controlling for all baseline measures and social desirability). The path coefficients of the control condition were first constrained to be equal to those of the intrinsic values condition (baseline χ^2 and RMSEA are equal to zero since the model is just identified). Results revealed poor fit indices for this constrained model, $\chi^2(9) = 18.46$, $p < 0.05$, RMSEA $= 0.15$, indicating that the model was not equal across the two conditions. Further analyses of the differences between the two conditions revealed that the path engagement $\rightarrow$ intrinsic value priorities at four weeks, $\Delta\chi^2(1) = 9.16$, RMSEA $= 0.41$, and the path intrinsic value priorities at 4-weeks $\rightarrow$ well-being at four weeks, $\Delta\chi^2(1) = 3.86$, RMSEA $= 0.16$, were significantly different across the two conditions. Indeed, in the experimental condition, engagement was significantly associated with increases in intrinsic value priorities over time ($\beta = 0.40$, $p < 0.001$), which was, in turn, associated with increases in well-being over time ($\beta = 0.44$, $p < 0.01$). These relationships were not significant in the control group ($\beta = 0.01$ and $\beta = 0.02$, respectively). All other paths were not significantly different between the two conditions, $\Delta\chi^2(7) = 6.02$, n.s, RMSEA $= 0.00$. In addition, in the intrinsic values group, the relationship between engagement and well-being ($\beta = 0.44$, $p < 0.01$) was substantially reduced ($\beta = 0.20$, n.s) with the inclusion of the mediator. Figure 1 shows this mediation for each group separately.

A Sobel test was used to calculate the significance of mediation for the path leading from engagement to the values index to the level of well-being. A Sobel test indicates whether a mediator variable (values at the four-week assessment) significantly carries the influence of an independent variable (exercise engagement) to a dependent variable (well-being at four weeks); that is, whether the indirect effect of the independent variable on the dependent variable through the mediator variable is significant. The Sobel test was significant, $z = 2.35$, $p < 0.05$.

Discussion

This study expanded on previous work examining values and well-being in several ways. Rather than confronting participants about their values (Grube et al., 1994; see Experiment 1, Maio et al., 2009) or assigning intrinsic and extrinsic goals (Sheldon, Gunz, et al., 2010), we invited participants to think about the distinction between intrinsic and extrinsic pursuits and to reflect deeply on their personal intrinsic values. We followed previous researchers who had participants write about their values (King, 2001; Sheldon & Lyubomirsky, 2006), but we provided a direction for their written reflections, drawing on a substantial body of research indicating that prioritizing intrinsic over extrinsic values is associated with greater well-being. We found that it is possible to direct individuals towards intrinsic rather than extrinsic values while allowing them to reflect on values that are personally meaningful. We looked specifically at change in values, a neglected topic in psychology research (Bardi et al., 2009), and linked it to well-being, providing experimental evidence for the relationship between prioritizing intrinsic over extrinsic values and well-being.

To summarize the results, participants in the intrinsic values group experienced greater well-being immediately following the written reflection than participants in the control group, controlling for social desirability and participants' baseline values and well-being. Over the next four weeks, participants in the experimental group were encouraged to continue reflecting on their intrinsic values while participants in the control group were encouraged to continue thinking about their daily activities. At the end of the four weeks, the more deeply participants had reflected on their intrinsic values, the more they prioritized intrinsic over extrinsic values and the greater their well-being, controlling for social desirability as well as baseline values and well-being. There were no such effects for participants in the control group, that is, whether or not they engaged in thinking about the daily details of their lives, they did not experience a shift in their value priorities or benefits to their well-being. Finally, we found evidence for a mediational link indicating that in
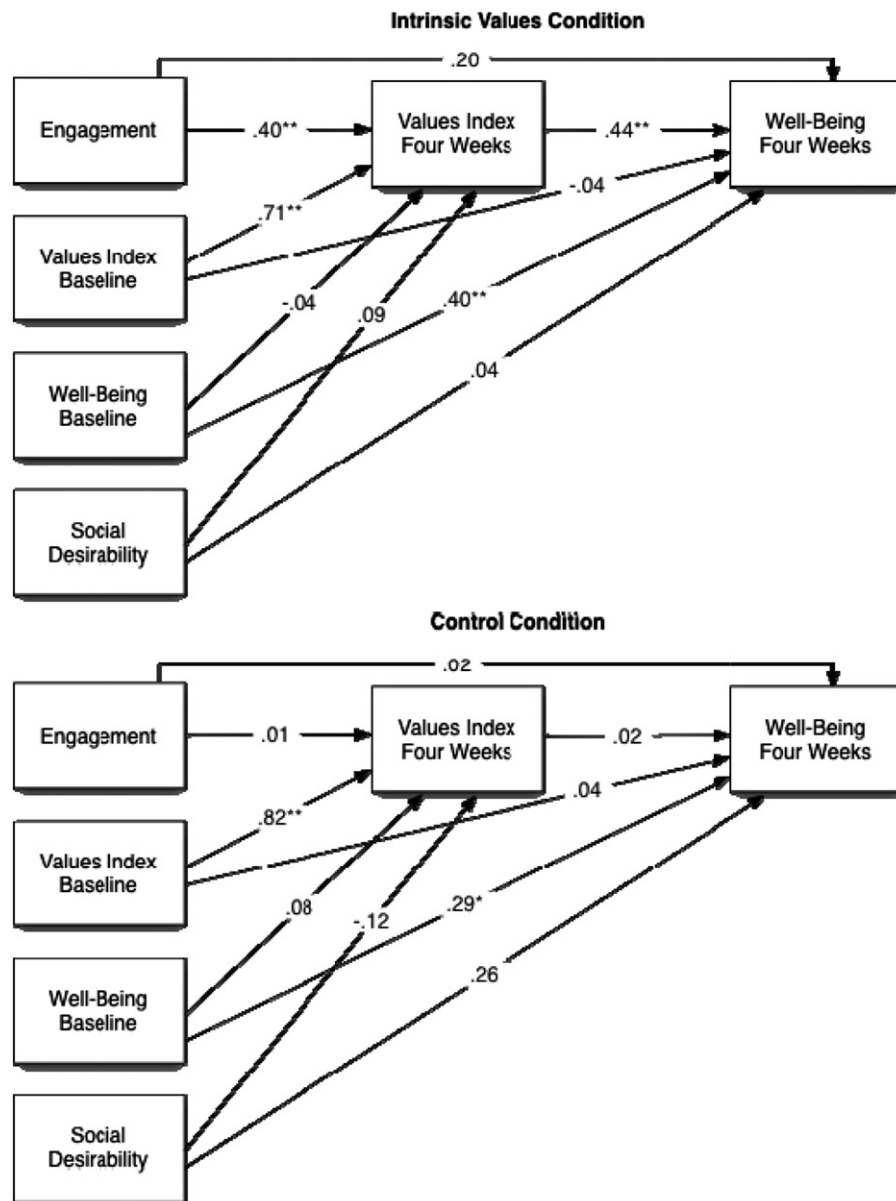
Figure 1. Multiple-group path analysis examining the mediation engagement → increases in intrinsic value priorities → increases in well-being across experimental conditions.
Notes: *$p < 0.05$, **$p < 0.01$. Paths without an asterisk are not significant.

the intrinsic values group, the association between engagement and increased well-being was mediated by changes in the degree to which participants prioritized intrinsic over extrinsic values.

Our findings are congruent with previous work in which reflecting on life goals led to greater well-being. Compared to control and gratitude exercises, researchers found that imagining success at one's life goals was the most beneficial for increasing and maintaining positive mood (Sheldon & Lyubomirsky, 2006). Writing about life goals was associated with feeling less upset, more happy, and getting sick less often compared to writing about trauma or a control topic (King, 2001). Researchers have also shown that

clarifying values is important in clinical settings, such as helping individuals cope with pain (Branstetter-Rost, Cushing, & Douleh, 2009). We found that immediately after doing a 20-min reflection on their intrinsic values, participants experienced greater well-being, compared to participants who wrote about their life details. This supports the findings in which writing about life goals led to an immediate increase in positive mood, while writing about trauma led to a slight decrease (King, 2001) and visualizing success at one's life goals produced an increase in positive affect while paying attention to life details and counting one's blessings did not (Sheldon & Lyubomirsky, 2006).

During the written exercise, participants were given the space and time to reflect on their values, whereas the follow-up reflections required more initiative. Consistent with the sustainable happiness model (Lyubomirsky, Sheldon, & Schkade, 2005), in which long-term emotional benefits demand persistent effort, we found that the more that participants felt engaged in reflecting on their intrinsic values through the four weeks of the study, the greater their well-being at the four-week follow-up. Similarly, Sheldon and Lyubomirsky (2006) found that having self-concordant motivation and continuing to practice a life goals visualization exercise led to greater well-being at the follow-up assessments. Notably, we found benefits to individuals' well-being while controlling for social desirability, a variable that may bias value ratings (Schwartz, Verkasalo, Antonovsky, & Sagiv, 1997). Moreover, we included an active control condition that matched the values condition in length and depth and provided similar information that doing the exercises is linked to increased well-being. The experimental and control groups were similar in their level of engagement, that is they found the study exercises equally helpful, worthwhile, thought-provoking, and insightful, yet only engagement in the intrinsic values condition impacted participants' well-being.

Researchers have found that priming certain values leads to changes in value ratings (Gardner, Gabriel, & Lee, 1999) as well as changes in behaviors congruent with the primed values (Maio et al., 2009). Peoples' values have also been shown to change following traumatic events (Verkasalo et al., 2006) and changes in political system (Danis et al., 2011). We took an approach in which individuals can play a more active role in changing their values. Given the findings that intrinsic and extrinsic values tend to group in a circumplex model (Grouzet et al., 2005) and that values tend to change in this manner (Maio et al., 2009), we looked at changes in the degree to which participants prioritized intrinsic values for close relationships, self-growth, and community contribution over extrinsic values for wealth, an attractive image, and popularity. We found that our intervention, a lab session reflection and writing exercise, followed by four weekly exercises in which participants again reflected on their intrinsic values, led to a change in their prioritization of intrinsic values, the more that participants felt engaged in the reflection exercises. Thus, a relatively brief intervention led young people to orient more towards intrinsic values. This suggests that reflecting on intrinsic values is an effective way of increasing their centrality. Although the change in values that we observed was relatively small, the fact that it was statistically significant despite the brevity of our intervention is noteworthy. Furthermore, researchers argue that small changes in values may be systematic and meaningful (Bardi et al., 2009).

While previous studies suggest that value priorities become more intrinsically oriented over time (Sheldon, 2005; Sheldon et al., 2003; Sheldon & Kasser, 2001), our findings indicate that values can also change as a result of reflecting on them in an engaged manner. Kasser (2011) describes social modeling as one of two paths in which individuals come to prioritize extrinsic, materialistic values. Presenting young people with the research on the benefits of prioritizing intrinsic values and giving them the opportunity to reflect on their intrinsic values may help to counter extrinsic values espoused by others and society. In this way they may get in touch with their true values, the ones that help them feel fulfilled, described as an organismic valuing process by Rogers (1964).

We used written exercises as a natural means of reflecting on intrinsic values. As an example, the following is an excerpt from a participant's first emailed follow-up reflection.

> Focusing my time and energy on close, fulfilling relationships and on my own personal growth instead of worrying about what other people think has helped me break out of the cycle of trying to please other people and develop a stronger sense of self. I want to live my life in my own way, guided by the things I care about most, rather than blindly chasing after what other people value. In order to do this, it is so important to have friends and family who love and accept you for who you are.

A large body of research has demonstrated that writing has salubrious effects (for a review, see Frisina, Borod, & Lepore, 2004; Smyth, 1998). A question that arises is whether the benefits that we found for participants' well-being are due to the act of writing rather than reflecting on intrinsic values. Our finding that participants' increase in well-being was related to the changes in the degree to which they prioritized intrinsic values at the four-week follow-up supports the notion that reflecting on intrinsic values led to greater well-being. This is congruent with the finding that affirming values underlies the benefits of expressive writing (Creswell et al., 2007). These researchers examined three potential mediators of the effects of expressive writing on the physical health of breast-cancer survivors: self-affirmation of values, cognitive processing, and discovery of meaning. Participants were asked to write about their experiences with breast cancer and their responses were coded for the three potential mediators. Only affirmation of values, such as close relationships or spirituality, mediated the effect of writing on participants' health. Interestingly, our study and Creswell et al.'s used different methodology – asking participants to specifically write about their values versus asking participants to write freely about their experience and then coding their responses for values- and arrived at a similar finding.

Limitations and future directions

The present study was limited in several ways. We did not include a group in which participants reflected on their extrinsic values. Inclusion of such a group would provide stronger evidence that it is reflecting on intrinsic values in particular that is beneficial. Given the research on extrinsic values and well-being (see Kasser, 2002b for a review) and the finding that individuals with an extrinsic value orientation do not experience well-being benefits from attaining extrinsic goals (Sheldon, Gunz, et al., 2010), we would expect reflecting on extrinsic values to either lower well-being or produce no effect.

The inclusion of an extrinsic values group would also help us understand the mechanism that leads from reflecting on intrinsic values to well-being. Self-determination theory suggests that an intrinsic value orientation is related to well-being because it satisfies the psychological needs for autonomy, competence, and relatedness (Deci & Ryan, 2000; Kasser, 2002b). Future research could assess how reflecting on values impacts the satisfaction of the three needs, a limitation of the present study, and examine whether the satisfaction of needs differs in intrinsic and extrinsic reflection groups, explaining the link to well-being. Indeed, when participants were asked to set goals that satisfy psychological needs versus goals to improve life circumstances, only the former influenced happiness (Sheldon, Abad, et al., 2010). Studies are further necessary to examine the mechanism that led participants to experience an increase in well-being immediately after reflecting on and writing about their values. Cognitive processes, such as priming need-satisfying experiences could be explored.

The present study is further limited in length. We examined value change over the course of four weeks. Given that values are enduring beliefs (Rokeach, 1973), it would be interesting to examine ongoing reflections over a longer period. Longitudinal studies are needed to observe whether changes in value priorities and well-being are maintained. In light of Lyubomirsky et al.'s (2005) sustainable happiness model, we might expect more effort and commitment over longer periods to lead to greater changes. Bardi and Goodwin (2011) similarly suggest that while priming effects on values are likely to be temporary, if a new life situation primes a concept repeatedly, a more permanent change in values may occur.

Further research is also needed to understand why some participants felt more engaged in reflecting on their values than others. Researchers have suggested that whether an individual's mood is improved by an exercise depends on the fit with the person's personality, motives, strengths, or needs (Fordyce, 1983; Sheldon & Lyubomirsky, 2006). Notably, participants who engaged more deeply in our study tasks did not differ from less-engaged participants on any of our pre-measures assessing their values and well-being. It may be that participants who engage more deeply have greater self-concordant motivation, leading to greater well-being benefits, as found by Sheldon and Lyubomirsky (2006). Future research is needed to discover what leads to a good fit with a values reflection exercise, as well as which mechanisms are involved in engaged reflection.

Finally, future studies could also examine whether individuals who reflect on their intrinsic values also change their behavior congruently. This would help identify whether longer-term increases in well-being are related to individuals engaging in more need-satisfying experiences, congruent with their intrinsic values. Researchers disagree about whether values guide behavior and values have been shown to relate differently to value-congruent behavior, with stronger relationships for some values than others (Bardi & Schwartz, 2003). Placing importance on intrinsic life goals has been found to relate positively to attainment of these goals (Niemiec et al., 2009). Furthermore, Brown and Kasser (2005) found that an intrinsic value orientation was related to ecologically responsible behavior among adolescents and adults. Thus, reflecting on intrinsic values may lead individuals to focus more on these values and alter their behavior accordingly.

Rogers (1980) described a process in which individuals 'discover the source of values in themselves, coming to an awareness that the good life is within, not dependent on outside sources' (p. 203). In the present study, we encouraged young people to reflect on their intrinsic values, rather than extrinsic values dependent on the reaction of others. Our findings provide evidence for the effectiveness of reflection exercises to influence value priorities and well-being. Since individuals played an active role in the reflection exercises, this work has implications for psychotherapy and other self-development efforts. Given the brevity of the intervention, these exercises could easily be incorporated into different settings, for example, high school and university counseling centers. Our research also has implications for longer-term benefits that may arise with a longer, more intensive reflection process.

Notes

1. The term engagement was used to capture a subjective assessment of how deeply participants in the experimental group reflected on their values and how involved participants in the control group were in thinking about their life details.

2. Hypotheses 2 and 3 were also tested using the measures of engagement that we used to examine the concurrent validity of self-reported engagement: number of words and coded depth of engagement. These analyses were not significant, indicating that it was a subjective sense of feeling engaged that was important in experiencing greater well-being and influencing value priorities among the experimental participants.

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