



Positive value change during college: Normative trends and individual differences

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Abstract

Do college students move towards “healthier values” over the college years? I examined this question using Kasser and Ryan’s (1993, 1996, 2001) distinction between intrinsic (community, intimacy, and growth) and extrinsic (money, popularity, and appearance) values. Graduating seniors evidenced large shifts away from extrinsic values, and to some extent shifts towards intrinsic values, compared to their freshman year scores. Those who evidenced greater intrinsic value shifts also reported greater increases in psychological well-being over the college career (Ryff & Keyes, 1995), and greater increases in their sense of self-determination in life. Implications for developmental and positive psychology are discussed.

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1. Introduction

Do college students develop healthier and more pro-social values during their four years on campus? Although parents, college administrators, and college professors would like to believe so, the issue of positive value-change during college has received little research attention. One reason for this inattention is the prior hesitation of psychologists to address questions concerning the nature of “positive or healthy” values (Kendler, 1999). This question itself seems to require a value judgment, which research scientists have been understandably reluctant to make. A related reason for the inattention to this issue is that most value models do not make a priori assumptions regarding which values may be healthier than others, and also have not

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attempted to relate different types of values to positive outcomes, such as psychological well-being, optimal performance, and ego development.

In the current research, I focused on a model and measure of values that *does* provide a way of conceptualizing healthy values, and also of measuring positive longitudinal change in values. Specifically, I used self-determination theory (SDT) and its distinction between intrinsic values and extrinsic values (Deci & Ryan, 2000; Kasser, 2002; Kasser & Ryan, 1996). Intrinsic values are thought to be inherently satisfying to pursue, as they are directly relevant to important psychological needs such as autonomy, competence, and relatedness (Deci & Ryan, 2000). Examples of intrinsic values are those for personal growth, social connection, and societal contribution. In contrast, extrinsic values are less directly satisfying of psychological needs, because they are more likely to involve contingent or unstable self-esteem, non-enjoyable or even demeaning activities, and external pressures (see Kasser, 2002; for a review). Examples of extrinsic values include those for financial success, social fame/popularity, and physical beauty.

As implied by the above, SDT assumes that intrinsic values tend to be more beneficial than extrinsic values, both for the individual and for his/her society. Thus, consistent with the positive psychology approach (Seligman & Csikszentmihalyi, 2000), SDT's values model is willing to make and test propositions about "optimal" values and ways of being. To measure values, SDT researchers have asked participants to rate the importance of a broad range of values, after which the relative importance of a set of intrinsic values, compared to a set of extrinsic values, is calculated for each subject. Research has shown that relative intrinsic orientation is associated with many positive individual outcomes, including self-rated well-being, interviewer-rated adjustment, and behavioral persistence and performance (Kasser, 2002; Sheldon & Kasser, 2001; Vansteenkiste, Simons, Lens, Sheldon, & Deci, in press). Consistent with the idea that intrinsic values are also more beneficial for the social surround of those who hold them, relatively strong intrinsic valuing has been associated with adaptive cooperation within social dilemmas (Sheldon & McGregor, 2000; Sheldon, Sheldon, & Osbaldiston, 2000), with more voluntary helping behavior (Sheldon & Kasser, 1995), and with more concern and caring within intimate relationships (Kasser & Ryan, 2001).

These findings suggest that the original question of this article might be rephrased thusly: "do college students move towards intrinsic values and away from extrinsic values over the course of their college career?" In fact, several recent studies indicate that such movement may be the prevailing pattern over time. In cross-sectional studies of adults aged 18–85, Sheldon and Kasser (2001) and Kasser and Ryan (1996) showed that chronological age was associated with relatively stronger intrinsic values, and Sheldon and Kasser (2001) showed that this effect partially mediated the association between age and subjective well-being. Also, in three short-term longitudinal studies, Sheldon, Arndt, and Houser-Marko (2003a) showed sample mean-level shifts towards intrinsic values and away from extrinsic values, over periods ranging from 20 min to six weeks.

Why do such shifts occur? Although this question goes beyond the current study, my assumption is that they result from the functioning of an organismic valuing

process (OVP; Kasser & Sheldon, in press; Rogers, 1951, 1964; Sheldon et al., 2003a, 2003b). The OVP can be defined as an innate human ability that helps people to coalesce and integrate much internal information, including their current feelings and their remembered responses to their own past actions, in order to make informed choices about what to do next (Kasser & Sheldon, in press; see also Kuhl, 2000; for further consideration of such parallel-intuitive cognitive networks). Of course, people may lose touch with or fail to consult their OVP, perhaps because they become preoccupied with securing the contingent positive regard of judgmental others (Rogers, 1964). Although Rogers focused considerable attention on this problematic state and the means by which psychotherapists might help clients get back in touch with their OVP, he also emphasized that the OVP is an inherent feature of healthy human nature, which tends to hold sway unless the individual's circumstances are unusually depriving or non-supportive. If Rogers' (1964) propositions are correct, then *when* people change in their value-endorsements (as opposed to remaining constant), they should more often shift in the direction of demonstrably healthier values, and less often shift in the direction of demonstrably less salubrious values.

The primary aim of the current article was to again test this "biased shift" idea (Sheldon et al., 2003a, 2003b; Sheldon & Kasser, 2001), this time in a four-year longitudinal study of the college career. Although this is not enough time to answer questions concerning changes in values over the entire life-span, still, it is a very important span: the period when adult identity and vocation are being formed (Arnett, 2000), and during which institutions of higher learning hope to have a positive effect upon their charges' values and personal integrity. Consistent with my assumption that positive personality change indeed occurs over this important period, Robins, Fraley, Roberts, and Trzesniewski (2001) recent college study demonstrated 4-year sample mean-level shifts in desirable personality traits, towards greater conscientiousness, greater openness, greater agreeableness, and less neuroticism. The current study sought to extend their findings to desirable values. I also sought to discover which type of value-change, if either, is stronger: that away from extrinsic values, or that towards intrinsic values. Thus, the two types of values will be examined separately, below.

Notably, the expectation of positive value change during college might also be predicted from other theoretical viewpoints besides the organismic perspective. For example, Erikson's (1963) theory of normative personality change suggests that young people move away from identity concerns and towards intimacy concerns during late adolescence, due to the joint influence of cumulative maturation and advancing role-expectations. These shifts in life-task orientation roughly parallel the current postulated movement away from extrinsic (ego- and social comparison-focused) values and towards intrinsic (personal growth and other-focused) values. Supporting this conceptual linkage, Sheldon and Kasser (2001) showed that chronological age predicted movements towards Eriksonian intimacy life-tasks and away from identity life-tasks, in addition to predicting movement away from extrinsic values and towards intrinsic values. Similarly, Arnett (2000) has also suggested that there is a movement away from self-centeredness and towards emotional intimacy and the broader community, which occurs in his proposed developmental period of "emerging adulthood" (which encompasses the college years).

In addition to examining whether there would be sample mean-level change in values over the four years of college, I also tested two hypotheses concerning individual differences in value change. My first hypothesis was that movement towards intrinsic and away from extrinsic values would be correlated with positive changes in well-being. This would be expected, given the proposition that intrinsic values are in some sense healthier and more satisfying, or that extrinsic values are more frustrating and less satisfying. It would also be expected given the typical cross-sectional associations of intrinsic and extrinsic values with well-being (Deci & Ryan, 2000). Of course, with a two-wave design (as in the current study), it is impossible to tell which type of change, if either, is causal with respect to the other. Still, to find that these changes occur in parallel would support the general assumption that movement towards intrinsic and away from extrinsic values is likely to be positive or beneficial.

My second individual differences hypothesis was that intrinsic value change would be associated with increases in participants' felt self-determination in life, and vice versa for extrinsic value change. This hypothesis was based on SDT's proposals concerning optimal human development (Deci & Ryan, 1985, 1991, 2000). According to SDT, a crucial developmental task for all individuals is establishing a sense of greater personal authenticity and ownership of their goals and behaviors, a state in which social influences and personal needs are reconciled and integrated. Indeed, dozens of studies in the SDT tradition support the importance of feeling self-determined (see Deci & Ryan, 2000; or Sheldon, Williams, & Joiner, 2003b; for a review), an assumption that is generally reflected in many other theories of personality development including those focused on identity status (Marcia, 1987), ego development (Erikson, 1963), and personal expressiveness (Waterman, 1993). Based on these theories and evidence, I expected that movement towards intrinsic and away from extrinsic values would be associated (causally or not) with felt self-determination. This prediction is also supported by the fact that felt self-determination is typically correlated with relative intrinsic value orientation in cross-sectional analyses (Sheldon & Kasser, 1995, 1998).¹

1.1. Summary and hypotheses

In sum, my primary hypothesis was that a sample of college students would shift towards intrinsic values and away from extrinsic values over the course of their college career. This normative prediction is consistent with other recent findings concerning positive personality change over time (Robins et al., 2001; Sheldon & Kasser, 2001), but extends them to consider positive value-change over a crucial four years for young adult development. Two secondary hypotheses were tested, concerning individual differences in value change and their association with other types of

¹ Notably, SDT distinguishes between two primary facets of motivation: the "what" or explicit content of motivation, and the "why" or underlying reasons behind motivation (Ryan, Sheldon, Kasser, & Deci, 1996; Sheldon, Ryan, Kasser, & Deci, in press). In essence, my third individual differences hypothesis says that as students become more self-determined in their underlying reasons for acting (the "why" of motivation), they also become more oriented towards intrinsic goal-contents (the "what" of motivation).

personality change. Specifically, I hypothesized that shifts towards intrinsic and away from extrinsic values would be associated with increases in psychological well-being and also with increases in felt self-determination, consistent with SDT's assumptions concerning optimal need-satisfaction and human development.

2. Methods

2.1. Sample and procedure

The sample consisted of 109 graduating seniors at the University of Missouri (class of 2002), 18 men and 91 women, who had taken part in a year-long study of freshman adjustment beginning 3.7 years ago. Data from this sample were originally reported by Sheldon and Houser-Marko (2001).² Forty-nine percent of the final participants were originally recruited in introductory psychology classes, and 51% were recruited via letters sent during the summer prior to the fall semester. The vast majority of MU students are Caucasians from middle-class background, and most live on campus during their careers.

Although 239 students began the study in the fall of 1998, only 114 of them completed all eight parts of the study during that year (Sheldon & Houser-Marko, 2001). In the current study I attempted to re-contact the entire initial sample. Of the 109 participants who subsequently completed questionnaires in their senior year, 87 were members of Sheldon and Houser-Marko's (2001) final sub-sample of 114 that completed all questionnaires during the freshman year. To maximize power, I chose to employ all 109 senior participants for the current analyses. This was also reasonable because all of the time 1 measures reported in the current article were collected during the first semester of the freshman year. *T* test attrition analyses comparing the time 1 scores of the 109 senior participants to the time 1 scores of the 130 initial participants who did not complete the senior measures revealed no significant differences between the two groups for any of the primary study variables (intrinsic and extrinsic values, PWB, and self-determination), suggesting that the final sample was not appreciably different from the initial sample.

Participants were contacted by email and telephone early in the spring semester of their senior year (i.e., February 2002), and offered \$25 for participating in a final assessment. Participants were asked to complete the questionnaire at their own time and pace, and then mail it back to the researchers. Several follow-up emails, telephone calls, or mailings were made over the course of the semester, resulting in

² None of the same measures are employed in the current article. The gender imbalance reflects the imbalance in Sheldon and Houser-Marko's original sample. Notably, the percentage of men in the final sample (15.8%) was essentially the same as in the initial sample (13.8%). Also, *t* tests revealed no significant difference mean differences between men and women for any of the primary study variables, and also, no interactions of primary study effects with gender. These analyses suggest that the results of the study should generalize to both genders.

the final sample of 109. The measures given to the seniors were the same as measures given to them at the beginning of the freshman year (with two exceptions, noted below).

2.2. Measures

2.2.1. Values

Participants twice completed the Aspirations Index (Kasser & Ryan, 1996, 2001; Sheldon et al., 2000), which assesses six different value domains. Three of these are defined as “intrinsic” (personal growth, community contribution, and emotional intimacy), and three are defined as “extrinsic” (financial success, physical attractiveness, and fame/popularity). Using a 1 (not at all important) to 5 (very important) scale, participants rated how important it is that each of 30 items be attained in the future. Example items include “I will assist people who need it, asking nothing in return” (community contribution), “My name will be known by many people” (fame/popularity), “I will gain increasing insight into why I do the things I do” (personal growth), “I will have committed, intimate relationships” (emotional intimacy), “I will achieve the ‘look’ I’ve been after” (physical attractiveness), and “I will have many expensive possessions” (financial success).

Although past research has often focused on the *difference* between the endorsement of extrinsic compared to intrinsic values (Kasser & Ryan, 1996, 2001; Sheldon & McGregor, 2000), in the current study I chose to focus on two separate composite measures, computed by independently averaging the three intrinsic values and the three extrinsic values (α s for the two 15-item scales = .87 and .89, respectively, in the freshman year, and .76 and .93 in the senior year). Supporting this procedure, principal components analyses of the six value scores yielded a clean 2-factor solution for both the freshman year and the senior year data, with the intrinsic values loading on one factor and the extrinsic values loading on the other factor (all loadings .55 or greater). In addition, I examined each of the six value domains by itself, at both times (the 12 α s ranged from .60 to .89).

2.2.2. Well-being

To assess well-being I used the short form of the Ryff and Keyes (1995) psychological well-being (PWB) scale. Keyes, Shmotkin, and Ryff (2002) defined this construct as involving “the perception of engagement with the existential challenges of life.” The 18-item measure has six facets: positive relations with others, self-acceptance, autonomy, environmental mastery, purpose in life, and personal growth. Participants rated the items using a 1 (strongly disagree) to 6 (strongly agree) scale in the freshman year, and a 1 (strongly disagree) to 5 (strongly agree) scale in the senior year. In order to better equate the freshman and senior year measures, for both I employed the POMP procedure (Cohen, Cohen, Aiken, & West, 1999), in which individual scores are rescaled to represent the “percentage of the maximum possible score.” Below I focus on two aggregate PWB variables (Keyes et al., 2002), which were computed by summing the 18 items and converting them to a percentage of the maximum possible score (α s = .71 and .80, respectively).

2.2.3. Self-determination

To assess students' sense of self-determination I used the 10-item self-determination scale (Sheldon, 1995; Sheldon & Deci, 2004; Sheldon, Ryan, & Reis, 1996; Thrash & Elliot, 2002) in both the freshman and the senior year. This measure contains pairs of statements such as "I always feel like I choose the things I do" versus "I sometimes feel that it is not really me choosing the things I do." Participants rate which statement seems more true for them, using a 1 (only the first statement seems true) to 3 (both seem equally true) to 5 (only the second statement seems true) scale. Self-determination scores were computed for each time period by averaging the ten items, after reverse scoring the appropriate items (α s = .69 and .78, respectively).

3. Results

3.1. Preliminary analyses

As one preliminary analysis, I examined the inter-correlations of all study variables. These coefficients are presented in Table 1. As a second preliminary analysis, I examined sample mean-level change in the "outcome" variables (PWB and self-determination), making no predictions. Two paired-sample *t* tests revealed no significant changes. I also examined the percentage of the sample that increased and decreased for each outcome variable, using the Reliable Change Index (RCI; Jacobson & Truax, 1991). The RCI takes into account random variation around the participant's own mean as well as test-retest reliability, allowing one to create three groups; those who have reliably decreased on the measure, those who have remained the same, and those who have reliably increased. The distribution of cases across these three categories for a particular variable can be examined with a χ^2 test, to determine if these differences differ from chance. According to these two tests, there

Table 1
Inter-correlations of major study variables

	Variables							
	1	2	3	4	5	6	7	8
1. F. Intrinsic orientation	1.0							
2. S. Intrinsic orientation	.31	1.0						
3. F. Extrinsic orientation	-.01	.05	1.0					
4. S. Extrinsic orientation	-.14	.08	.51	1.0				
5. F. Self-determination	.41	.06	.00	.10	1.0			
6. S. Self-determination	.23	.28	-.05	-.11	.34	1.0		
7. F. PWB	.07	.06	-.14	-.11	.17	.21	1.0	
8. S. PWB	.19	.43	-.08	-.09	.10	.10	-.08	1.0

Note. Correlations equal or greater to .19 are significant at the .05 level. Correlations equal or greater to .25 are significant at the .01 level.

Note. F., Freshman; S., Senior.

was no significant sample-wide change for either self-determination or PWB (both p 's $> .5$).

3.2. Normative changes in values

To test my primary hypotheses I first conducted eight paired-samples t tests, one on the aggregate intrinsic value orientation variable, one on the aggregate extrinsic value orientation variable, and one on each of the six constituent value variables. Table 2 presents the results, as well as d -scores indicating effect sizes. There was a highly significant decrease from freshman to senior year in the aggregate extrinsic value orientation variable ($p < .01$). There was a near-significant increase in the aggregate intrinsic value orientation variable ($p < .10$). Turning to the individual value domains, the sample evidenced significant decreases in all three of the extrinsic values (all $ps < .01$). Also, there was a significant increase in the valuing of emotional intimacy ($p < .01$). However, there was no significant change in the valuing of personal growth ($p < .11$) or of community contribution ($p > .50$).

To test the hypothesis in a second way I conducted eight RCI analyses, one for aggregate extrinsic values, one for aggregate intrinsic values, and one for each of the six individual value domains. Table 3 contains the results, which were similar (though not identical) to those obtained using t tests. As can be seen, there was significant change in aggregate extrinsic values, as 13.8% of the sample reliably decreased, whereas 1.8% of the sample reliably increased. The same was true for financial success and fame/popularity values; however, physical attractiveness values did not reliably decrease by this measure ($p < .13$). Significant numbers of participants reliably increased in aggregate intrinsic values (recall that this effect did not reach significance in the t tests). Turning to the individual intrinsic values, intimacy values reliably increased, personal growth values evidenced near significant positive change, and community contribution values again showed no change.

3.3. Association of value changes with PWB changes

To test my first individual differences hypothesis, that movement towards intrinsic values or away from extrinsic values would be associated with positive changes in

Table 2
Mean-level changes in values from the Freshman to the senior year

Value variables	Freshman year	Senior year	d	t	p
Aggregate extrinsic values	2.93	2.51	.57	5.99	<.01
Financial success	3.18	2.87	.36	3.74	<.01
Physical attractiveness	2.81	2.48	.65	3.95	<.01
Fame/Popularity	2.81	2.21	.38	6.84	<.01
Aggregate intrinsic values	4.41	4.49	.16	1.67	<.10
Emotional intimacy	4.71	4.86	.29	3.02	<.01
Personal growth	4.39	4.50	.16	1.63	<.11
Community contribution	4.13	4.12	.01	.11	>.50

Table 3

Changes in values from the freshman to the senior year according to the reliable change index

Value variables	% Who decreased	% Who were stable	% Who increased	χ^2 (2)	<i>p</i>
Aggregate extrinsic values	13.8	84.4	1.8	56.78	<.01
Financial success	8.3	88.0	3.7	15.60	<.01
Physical attractiveness	5.5	92.7	1.8	4.19	<.13
Fame/Popularity	13.8	85.3	.9	57.46	<.01
Aggregate intrinsic values	0.0	94.5	5.5	6.66	<.04
Emotional intimacy	0.0	93.6	6.4	9.46	<.01
Personal growth	0.0	95.4	4.6	4.63	<.10
Community contribution	1.8	95.4	2.8	.22	>.50

well-being, I first focused on the aggregate PWB variable from the senior year. Two analyses were conducted, one for the aggregate extrinsic values score and one for the aggregate intrinsic values score. Specifically, senior PWB was regressed upon PWB from the freshman year (to control for initial levels and to focus the analysis on rank-order shifts in PWB). In addition, the appropriate senior year value score was entered into the equation, to test the actual hypothesis. Furthermore the corresponding freshman year value score was also included, so that the effects of the senior year value measure would represent the effects of rank-order change in values. Including the freshman year value score also allowed me to evaluate the possibility of lag effects, in which a time 1 variable is associated with change from time 1 to time 2 in some outcome. No lag effects were predicted. However, a significant negative effect was predicted for senior year extrinsic values, and a positive effect was predicted for senior year intrinsic values.

Consistent with basic hypotheses, change in senior year intrinsic values, as shown by the relationship between senior year intrinsic values and senior year PWB controlling for freshman year intrinsic values and freshman year PWB, was significantly associated with increases in aggregate PWB ($\beta = .39$, $p < .01$; freshman year intrinsic values was non-significant in the equation, indicating no lag effects).³ However, change in extrinsic valuing was not associated with decreases in PWB ($\beta = -.15$, *ns*; freshman year extrinsic valuing was also non-significant). Next, I conducted 12 regressions to separately examine the association of the two types of value change with each of the six facets of PWB. Senior intrinsic values were associated with increases in personal growth ($\beta = .46$, $p < .01$) and purpose in life ($\beta = .39$, $p < .01$); the coefficients did not reach significance for the other four facets of PWB. Also, none of the freshman year intrinsic value coefficients were significant. Senior year extrinsic values significantly predicted decreases in the autonomy subscale ($\beta = -.22$,

³ Because the preliminary analyses revealed no sample mean-level changes for the “outcome” variables, it is appropriate to say that significant effects of senior values upon senior outcomes (controlling for freshman values and outcomes) indicates that values predict absolute increases (or decreases) in the outcomes.

$p < .05$); the coefficients did not reach significance for the other five facets of PWB. Also, none of the freshman year extrinsic value coefficients were significant.

3.4. Association of value changes with self-determination changes

To test my second individual differences hypothesis, I conducted two regressions, one for each pair of value measures. In each analysis, senior year self-determination was regressed upon freshman year self-determination, freshman year value orientation, and senior year value orientation. A significant negative effect was predicted for senior year extrinsic values, and a positive effect was predicted for senior year intrinsic values.

Analyses with the intrinsic value orientation measures confirmed the hypothesis, as senior year intrinsic value orientation predicted increases in self-determination ($\beta = .26$, $p = .01$; freshman year intrinsic value orientation was non-significant). However, senior year extrinsic value orientation was not significant in the second equation ($\beta = -.17$, *ns*; freshman year extrinsic value orientation was also non-significant).

4. Discussion

In this study I evaluated whether there is longitudinal value change over the course of the college career, using a model and measure that specifies a direction of “positive” change. The data indicate that some kinds of value change may indeed be normative in college—specifically, there were sample-wide mean-level changes towards emotional intimacy values, and away from material, popularity/fame, and physical attractiveness values. These results are consistent with other recent findings showing that people tend to move towards intrinsic and away from extrinsic values over time (Sheldon et al., 2003a, 2003b; Sheldon & Kasser, 2001), extending the finding to a four-year longitudinal study. The results are also consistent with recent findings concerning general positive change in personality traits over the college career (Robins et al., 2001).

From the SDT perspective, decreases in extrinsic values or increases in intrinsic values are both “positive” changes. However, it is noteworthy that in the current study, the changes in extrinsic values were larger than the changes in intrinsic values—specifically, the sample decreased in all three of the extrinsic values, and increased in only one of the intrinsic values. This may in part reflect a measurement issue, and the fact that intrinsic value endorsements started out closer to the ceiling. Alternatively, from a conceptual perspective, it may be that more of the positive development occurring over the college years involves rejecting extrinsic values (money, popularity, and beauty), than embracing intrinsic values (growth, intimacy, and community). Because of the status-conscious and consumeristic high school environment, students may arrive at college with a propensity to over-endorse extrinsic values. The opportunity to re-establish themselves away from the high-school environment, in combination with the opportunity to think in more sophisticated ways

about their lives, may reduce students' endorsement of extrinsic values. Alternatively, the predominantly liberal college environment may be especially effective at indoctrinating students against materialistic and extrinsic values. Future research will be required to evaluate these possibilities.

I also examined individual differences in value-change, and their associations with differential change in psychological well-being and experiential self-determination. Before discussing these findings, it is again important to point out that the current data and regression analyses cannot establish the causal direction (if any) of these associations, tempting as this may be. Thus, both possible causal directions, i.e., value change causing other types of change, and other types of change causing value change, will be briefly considered below.

Consistent with the hypothesis that movement towards intrinsic values is beneficial, those who evidenced the most such movement also evidenced the greatest positive change in psychological well-being. Again, SDT predicts this finding, based on the proposition that intrinsic values are directly satisfying of psychological needs (Deci & Ryan, 2000), and hence, more supportive of well-being. Of course, causality may go the other way; increasing well-being may also afford or support intrinsic value change. For example, Fredrickson's (2002) "broaden and build" model posits that positive affective states enable individuals to expand and elaborate their skills, resources, and interests, and Isen (1999) has demonstrated that manipulated positive affect leads to more communitarian and pro-social behavior, behaviors consistent with the current intrinsic values construct. Indeed, it may be that intrinsic value change and enhanced well-being can mutually reinforce each other, producing sustained cycles of positive change (Fredrickson & Joiner, 2002). Notably, decreases in extrinsic values were not significantly associated with increases in psychological well-being, suggesting that movement towards intrinsic values may be more important for well-being than is movement away from extrinsic values.

Supporting the assumption that movement towards greater self-determination is associated with movement towards more intrinsic values (Deci & Ryan, 2000), those who evidenced the greatest positive change in their global sense of self-determination also evidenced the largest movement towards intrinsic values. Thus, consistent with organismic, humanistic, and ego-developmental theories of personality development, it appears that increasing self-definition and identity-consolidation are associated with a rejection of "superficial" values concerning popularity, materialism, and physical attractiveness, as well as increasing emphasis on values concerning emotional intimacy. Of course, the arrow may also go the other way—that is, intrinsic value change may instead help students to achieve increases in self-determination. For example, "personal growth" is one of the six values assessed by the Aspirations Index, and it is logical that those who shift their focus towards personal growth values might thereby achieve a greater sense of self-determination. Notably, decreases in extrinsic values were not significantly associated with increases in self-determination, again suggesting that intrinsic values may be more important than extrinsic values for predicting "positive" outcomes.

What conditions best afford the development of more intrinsic and less extrinsic values? According to SDT, settings that support psychological need-satisfaction lead

to optimal positive outcomes (Deci & Ryan, 2000; Sheldon et al., 2003a, 2003b). In particular, SDT says that when authorities and important role models support their charges' autonomy (i.e., their right to make choices for themselves), while at the same time supporting their relatedness (i.e., their sense of connection with and acceptance by those authorities) and their sense of competence (i.e., their feelings of effectiveness and self-efficacy in the tasks-at-hand), then optimal outcomes ensue. In this light, the fact that the sample as a whole moved away from extrinsic values and towards some intrinsic values suggests that the University of Missouri environment was a reasonably supportive one, affording students at least adequate psychological need-satisfaction and developmental resources.

Of course, not all environments are equally supportive of peoples' psychological needs, and we might expect to observe different temporal trends in more problematic contexts. Sheldon and Krieger (in press) recently reported data relevant to this point. Their study of value-change over the first year of law school revealed significant sample-wide decreases in the valuing of community contribution (an intrinsic value), and sample-wide increases in the valuing of attractiveness/appearance (an extrinsic value). Indeed, these "negative shifts" were predicted, based on fact that most American law schools instantiate a highly competitive and even alienating environment, via their intense emphasis on grades, status, and the suppression of feeling (Krieger, 1998). More generally, many studies now demonstrate that extrinsic valuing is associated with both physical and psychological insecurity, and with the presence of cold or controlling others (see Kasser, 2002; for a review). In such contexts, the OVP may be suppressed or ignored (Rogers, 1964).

4.1. Caveats and limitations

However, it is also important to point out that there are a number of other possible explanations for the current results. First, one can ask whether the same positive patterns of change would occur for a sample of young working adults; again, given the predominant liberal culture on college campuses (Astin, 1992), it may be that these changes only occur for those who attend college. Also, one can ask whether the changes represent mere period or cohort effects, rather than typical developmental patterns that are independent of the participants' particular historical time or particular generation. In addition, one can ask whether the observed trends would be expected to continue life-long, even in the most supportive conditions. Given that participants were already near the top of the scale for the intrinsic values, there is little room for further "improvement" in this respect.

This research has a number of other important limitations. Again, direction of causality cannot be determined by these data; because it is impossible to achieve experimental control in a longitudinal study of this nature, the best one can do is test for patterns of association that are consistent with theory. Another limitation of the study is fact that participants were mostly Caucasian residents of the US Midwest; future longitudinal studies will need to establish the generalizability of results not only to other US college students, but also, to students in other nations and types of cultures (see Deci & Ryan, 2000; for discussion of emerging relevant literature).

Yet another limitation is that no measurements were made during these students' sophomore or junior years, meaning that the ability to pose and test process-based explanations of the observed changes is limited.

Still, the current data generally support an optimistic conclusion, namely, that there may be inherent developmental trends to shift towards values that are more beneficial, both for oneself and for society. Thus, consistent with the assumptions of the positive psychology movement, people may have important and previously unrecognized strengths that help them to grow and flourish (Keyes & Haidt, 2002; Seligman & Csikszentmihalyi, 2000). One of these strengths may be an "organismic valuing process" (Kasser & Sheldon, in press; Rogers, 1951; Sheldon et al., 2003a, 2003b) that helps people to move towards intrinsic values and/or reject extrinsic values over time, assuming conditions are reasonably supportive.

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