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Abstract

What motivates individuals to invest time and effort and overcome obstacles (i.e., strive for primary control) when pursuing important goals? We propose that positive affect predicts primary control striving for career and educational goals, and we explore the mediating role of control beliefs. In Study 1, positive affect predicted primary control striving for career goals in a two-wave longitudinal study of a U.S. sample. In Study 2, positive affect predicted primary control striving for career and educational goals and objective career outcomes in a six-wave longitudinal study of a German sample. Control beliefs partially mediated the longitudinal associations with primary control striving. Thus, when individuals experience positive affect, they become more motivated to invest time and effort, and overcome obstacles when pursuing their goals, in part because they believe they have more control over attaining their goals.

Keywords

happiness, positive affect, motivation, primary control striving, control beliefs

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Does happiness make people lazy or does it prompt them to strive for more? Lay people, artists, philosophers, and psychologists are divided in their answer to this question (Veenhoven, 1988).

The present article examines positive affect, a core aspect of happiness and subjective well-being (Diener, 2000; Diener, Oishi, & Lucas, 2009). Meta-analytic findings show that positive affect leads to long-term success in numerous life domains including work (Boehm & Lyubomirsky, 2008; Lyubomirsky, King, & Diener, 2005). Happy individuals, for example, show better job performance and have higher incomes. In this article, we investigate positive affect as a motivator. We propose that positive affect predicts primary control striving, that is, the motivation to invest time and effort and overcome obstacles, when pursuing important goals. Our focus in this article is on primary control striving for career and educational goals.

Primary Control Striving for Career and Educational Goals

Career and educational goals are highly relevant for people across the globe, particularly for young people who are transitioning into work (Chang, Chen, Greenberger, Dooley, & Heckhausen, 2006; Kalakoski & Nurmi, 1998; Schoon &

Silbereisen, 2009). Education and career success in turn have far-reaching implications for long-term development (e.g., Furnée, Groot, & van den Brink, 2008; Morris, Cook, & Sharper, 1994; Roberts, Walton, Bogg, & Caspi, 2006; Schoon & Silbereisen, 2009; Schulenberg, Bryant, & O'Malley, 2004). Although many individual and situational factors influence the attainment of educational and career goals, one key predictor of success is an individual's *primary control striving*, that is, the motivation to invest time and effort (i.e., selective primary control [SPC]) and overcome obstacles (i.e., compensatory primary control [CPC]) in the pursuit of goals (Heckhausen, Wrosch, & Schulz, 2010). Findings from longitudinal and intervention studies show that primary control striving is crucial for success in many life domains, including the domains of school and work (for a review, see Heckhausen et al., 2010). Both self-report and behavioral indicators of primary control

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striving predict successful outcomes on the subjective level (e.g., subjective career success and well-being) and on the objective level (e.g., educational attainment, job attainment; Duckworth, Peterson, Matthews, & Kelly, 2007; Haase, Heckhausen, & Köller, 2008; Haase, Heckhausen, & Silbereisen, in press; Kanfer, Wanberg, & Kantrowitz, 2001; Nurmi, Salmela-Aro, & Koivisto, 2002; Pinquart, Juang, & Silbereisen, 2003; Salmela-Aro, 2009; Tomasik, Hardy, Haase, & Heckhausen, 2009; Wiese, Freund, & Baltes, 2002). Yet, although much is known about the benefits of primary control striving, little is known about resources that enhance primary control striving for career and educational goals.

Positive Affect as a Motivator of Primary Control Striving

Positive affect can play several roles in the motivation of behavior. Anticipated positive affect motivates behavior (e.g., Custers & Aarts, 2005; see review in Heckhausen & Heckhausen, 2010), and goal-related positive affect stemming from goal pursuit and attainment feeds back into motivation (e.g., Carver, 2003; Carver & Scheier, 1998; Louro, Pieters, & Zeelenberg, 2007). The present article does not address anticipated affect or goal-related affect, but incidental (e.g., Loewenstein & Lerner, 2003) positive affect, which stems from goal-unrelated sources.

The motivational theory of lifespan development (Heckhausen et al., 2010), which grew out of the lifespan theory of control (Heckhausen & Schulz, 1995), proposes that positive affect is an important resource for primary control striving (Schulz & Heckhausen, 1998). This hypothesis builds on an evolutionary-functionalistic view of emotions, which proposes that positive and negative emotions serve adaptive functions (e.g., Averill et al., 1994; Frijda, 1988, 2010; Keltner & Gross, 1999; Levenson, 1999). We should note that Carver and colleagues have postulated the opposite effect: Positive affect should decrease primary control striving with regard to current goals and serve as a “signal to attend to something else” (Carver, 2003). Yet, their hypothesis focuses on goal-related positive affect, whereas the present article examines incidental positive affect.

Surprisingly few studies have examined effects of positive affect on primary control striving, and the available studies have yielded mixed findings. For example, Hom and Arbuckle (1988) found that children in a happy mood invested more effort on an assigned task than children in a sad mood. Melton (1995) concluded that “people in positive moods expend less effort” (p. 788). Williams and DeSteno (2008) demonstrated that pride induced by a feedback manipulation, but not unspecific positive affect, led to higher perseverance. Foo, Uy, and Baron (2009) found that state (but not trait) positive affect predicted higher proactive venture efforts among entrepreneurs. Seo, Bartunek, and Barrett (2010) showed that positive affect predicted higher effort in an Internet-based investment simulation study using an experience sampling method. Thus, empirical

findings are mixed. Moreover, what are the mediating pathways?

There are various pathways by which positive affect may enhance primary control striving. Positive affect has restorative neurobiological effects (e.g., Burns et al., 2008; Richter & Gendolla, 2009) and can repair depleted self-regulatory resources (Tice, Baumeister, Shmueli, & Muraven, 2007) that are needed for primary control striving. Moreover, positive affect may enhance primary control striving by boosting control beliefs. This particular mediating pathway will be explored in this article building on the mood-as-information theory (Schwarz, 2012; Schwarz & Clore, 1983) and the self-efficacy theory (Bandura, 1997). Specifically, the mood-as-information theory proposes that incidental positive affect colors cognition because individuals ask themselves “How do I feel about it?” and erroneously use their current affect as valid information to guide their thoughts. That is, positive affect provides (not necessarily realistic) information that things will go well. Supporting this prediction, experimental studies have shown that positive affect indeed enhances control beliefs and success expectations (e.g., Lerner & Keltner, 2001; Richter & Gendolla, 2009). Self-efficacy theory (Bandura, 1997) in turn proposes that self-efficacy (i.e., control) beliefs boost processes involved in primary control striving. This hypothesis has received broad empirical support in experimental and longitudinal studies (for a review, see Bandura, 1997; e.g., Bouffard-Bouchard, 1990; Shane, Heckhausen, Lessard, Chen, & Greenberger, in press). Despite clear evidence for both parts of the meditational chain, few studies (but see Seo et al., 2010) have combined them to investigate effects of positive affect on primary control striving mediated by control beliefs, especially regarding important real-world goals such as career or educational goals.

The Present Studies

The present studies investigated positive affect as a motivator. We expected positive affect to predict primary control striving (i.e., the motivation to invest time and effort and overcome obstacles) for career and educational goals over time. Moreover, we examined the mediating role of control beliefs. We put this hypothesis to the test in two longitudinal studies of U.S. and German youth during the transition from school to work. Career and educational goals are important goals during this life-span transition (e.g., Chang et al., 2006).

In Study 1, a two-wave longitudinal study of a multiethnic sample of U.S. youth, we examined longitudinal associations between positive affect and primary control striving for career goals. In Study 2, a six-wave longitudinal study of German youth, we sought to replicate and extend findings from Study 1, by examining longitudinal associations between positive affect and primary control striving for apprenticeship, occupational future, and educational goals as well as objective career outcomes. In both studies, we sought

to predict primary control striving over longer time intervals (i.e., several months). As we did not expect momentary positive affect to predict primary control striving over these longer time intervals, we examined somewhat longer lasting positive affective states (i.e., experienced over a week or a month) for a more reliable assessment.

Although this article focuses on positive affect as conceptually distinct from negative affect (Watson, Wiese, Vaidya, & Tellegen, 1999), we also examined whether negative affect predicted primary control striving. However, we did so without formulating specific hypotheses because research indicates that the motivational effects of negative affect may not be uniform but depend on the specific negative emotion (e.g., anger or sadness) involved (e.g., Carver, 2006; Carver & Harmon-Jones, 2009; Wrosch & Miller, 2009).

Study 1

Study 1 examined whether positive affect predicted primary control striving for career goals over time in a two-wave longitudinal study of a multiethnic sample of U.S. youth in the transition after high school. Moreover, we examined the mediating role of control beliefs. We also explored longitudinal associations between negative affect, specifically, depressive symptoms and primary control striving.

Method

Participants. The sample consisted of 1,185 youth recruited from four schools in Los Angeles to capture a multiethnic, working- and middle-class sample. At the first wave of data collection, participants were in their senior high school year. The present analyses are based on 752 participants who participated in the first two waves of data collection (mean age in years = 17.7 years; 60.2% female). The sample was ethnically diverse (22.8% White/European, 11.3% African American, 40.5% Hispanic/Latino, 9.5% South/Southeast Asian, 16.0% Other or Mixed). Parental consent was obtained for all minors, and all legal adult participants provided informed consent. Students were compensated at each wave by being entered into drawings for gift certificates (two US\$20 gift certificates per classroom and two US\$100 certificates per school).

Measures

Positive affect. A measure of positive affect experienced during the last week was created using selected items from the Center for Epidemiologic Studies Depression Scale (CESD; Radloff, 1991). Although the CESD is designed to assess depressive symptoms, it includes four items that have been used widely (e.g., Moskowitz, Epel, & Acree, 2008; Sheehan, Fifeield, Reisine, & Tennen, 1995) as indicators of positive affect (i.e., “I was happy,” “I felt hopeful about the future,” “I felt that I was just as good as other people,” “I

enjoyed life”; 1 = *rarely or none of the time*, 4 = *most or all of the time*; $\alpha = .65$ at Wave 1, $\alpha = .70$ at Wave 2).¹

Depressive symptoms. Depressive symptoms were assessed using the remaining 16 CESD items that were not used to compute our measure of positive affect (Radloff, 1991). These items measured depressive symptoms (e.g., poor appetite, crying, “the blues”) experienced during the last week (1 = *rarely or none of the time*, 4 = *most or all of the time*; $\alpha = .89$ at Wave 1, $\alpha = .88$ at Wave 2).

Primary control striving. Primary control striving was measured using the Optimization in Primary and Secondary Control (OPS) scale tailored to the career domain, which has demonstrated adequate measurement properties and validity in previous studies (Haase et al., 2008; Poulin & Heckhausen, 2007; Tomasik et al., 2009). *Primary control striving regarding career goals* was measured by four items assessing SPC (e.g., “I will work hard to have a good career”) and four items assessing CPC (e.g., “If my career path is not going in the right direction, I will get help from others”) on a 5-point scale (1 = *completely disagree*, 5 = *completely agree*). The primary control striving scale showed satisfactory internal consistency ($\alpha = .77$ at Wave 1, $\alpha = .78$ at Wave 2).

Control beliefs. Career-related control beliefs were measured by five items from the Control Agency Means-Ends in Adulthood Questionnaire (CAMAQ; Heckhausen, 1991) indicating ability and effort agency beliefs (e.g., “I am fit for the occupations I apply for”; 1 = *completely disagree*, 5 = *completely agree*) as well as expectancies (“How likely is it that you will attain your desired long-term career?” 1 = *very unlikely*, 5 = *very likely*). Internal consistency of the scale was mediocre ($\alpha = .63$ at Wave 1, $\alpha = .62$ at Wave 2).

Design and Procedure. Study 1 used a two-wave longitudinal design. Data were collected shortly before school graduation (Wave 1) and 1 year after graduation (Wave 2). For Wave 1, students completed in-class surveys. For Wave 2, surveys were mailed to students with a response rate of 63%. All measures analyzed here were assessed at Wave 1 and 2.

Results

Table 1 shows descriptive statistics and correlations for the study variables. Multiple regression analyses were used to test the hypothesis. Analyses were conducted longitudinally, with Wave 1 variables predicting relative increases in Wave 2 primary control striving. As a first step, Wave 2 career-related primary control striving was regressed on Wave 1 career-related primary control striving, positive affect, and depressive symptoms. The resulting model indicated that positive affect predicted relative increases in primary control striving ($\beta = .11$, $p = .004$) controlling for all other variables (Table 2, Model 1). Next, career-related control beliefs were added to test for mediation (Table 2, Model 2). The regression coefficient of positive affect

Table 1. Study 1: Descriptive Statistics and Correlations for Study Variables ($N = 752$)

Variables	$M (SD)$	Correlations						
		1	2	3	4	5	6	7
1. W1 Positive affect	3.27 (0.64)	—						
2. W1 Depressive symptoms	2.03 (0.59)	-.37***	—					
3. W1 Control beliefs (career)	4.07 (0.65)	.33***	-.12***	—				
4. W1 Primary control striving (career)	4.34 (0.52)	.18***	-.01	.24***	—			
5. W2 Positive affect	3.31 (0.66)	.41***	-.30***	.15***	.11**	—		
6. W2 Depressive symptoms	1.90 (0.57)	-.26***	.46***	-.08 [†]	-.03	-.43***	—	
7. W2 Control beliefs (career)	4.15 (0.60)	.21***	-.10**	.35***	.18***	.29***	-.16***	—
8. W2 Primary control striving (career)	4.36 (0.50)	.13***	.01	.22***	.34***	.19***	-.10**	.38***

Note: W1 = Wave 1; W2 = Wave 2.

[†] $p < .10$. ** $p < .01$. *** $p < .001$.

Table 2. Study 1: Wave 2 Primary Control Striving for Career Goals Regressed on Wave 1 Predictors ($N = 719$)

Wave 1 predictors	Wave 2 primary control striving (career)	
	Model 1	Model 2
Primary control striving (career)	.32***	.30***
Positive affect	.11**	.08 [†]
Depressive symptoms	.06	.06
Control beliefs (career)	—	.13***

Note: Standardized regression coefficients (β s).

[†] $p < .10$. ** $p < .01$. *** $p < .001$.

dropped to marginal significance ($\beta = .08, p = .06$). A Sobel test indicated that the indirect path in the postulated mediation model (i.e., mediation via control beliefs) was significant ($z = 3.15, p = .002$). Depressive symptoms (computed without positive affect-related items) did not predict primary control striving over time.

A set of follow-up analyses examined reverse associations with a special focus on primary control striving predicting subsequent positive affect. Although there was a positive association between Wave 1 primary control striving and Wave 2 control beliefs, controlling for Wave 1 control beliefs ($\beta = .10, p < .01$), Wave 1 control beliefs did not predict Wave 2 positive affect, controlling for Wave 1 positive affect ($\beta = .00$), and the association between Wave 1 primary control striving and Wave 2 positive affect, controlling for Wave 1 positive affect, was only marginally significant ($\beta = .07, p < .10$). This pattern of associations indicated that positive affect predicted primary

control striving more strongly than primary control striving predicted positive affect.

Discussion

Study 1 showed that positive affect predicted relative increases in primary control striving for career goals over time. That is, students who were happier subsequently increased their striving toward their career goals over previously assessed levels of primary control striving. Moreover, we explored the mediating role of control beliefs. Our findings were consistent with the postulated mediation model and provided a first hint that positive affect may enhance primary control striving for real-world goals such as career goals because it enhances beliefs that these goals can actually be attained. These results were found in a large multiethnic sample of U.S. high school seniors transitioning into work life and engaged in the highly relevant goal of career attainment. Depressive symptoms (excluding positive affect-related items) did not predict primary control striving.

Study 1 had several limitations. Positive affect was assessed using items not originally designed for that purpose (but widely used by others; for example, Moskowitz et al., 2008; Sheehan et al., 1995). Primary control striving was only assessed by self-report, not by any objective measure of goal pursuit or success. Moreover, primary control striving was only assessed in one goal domain and in a U.S. sample, limiting the generalizability of the findings to other goal domains and other cultures. Finally, Study 1 used a two-wave longitudinal design, which has well-known limitations (Rogosa, 1980).

Study 2

The aim of Study 2 was to replicate the longitudinal findings of Study 1 while improving on its limitations. To do so, Study 2 examined primary control striving in a different cultural context: a sample of German adolescents in the transition from high school (in our case *Realschule*) to vocational education. The German school-to-work transition involves particularly great time pressure in that *Realschule* youth typically seek so-called apprenticeships (Hamilton, 1990) after graduation, which are crucial for their occupational future but are in scarce supply and bound to a tight deadline (Poulin & Heckhausen, 2007).

The primary question of Study 2 was whether positive affect would predict primary control striving over time. Different from Study 1, Study 2 used a dedicated measure of positive affect (the Positive and Negative Affect Schedule [PANAS]; Watson, Clark, & Tellegen, 1988), examined objective outcomes of primary control striving and success (apprenticeship applications and offers), assessed primary control striving in several goal domains (for apprenticeship, occupational future, and educational goals), and used a six-wave longitudinal design. As in Study 1, we examined the mediating role of control beliefs. We focused on primary control striving and control beliefs in the goal domain of apprenticeship seeking as control beliefs were not assessed in the other domains. In addition, we explored whether negative affect predicted primary control striving over time.

Method

Participants. The initial sample consisted of three cohorts of 768 youth from Berlin, Germany. At the first wave of data collection, participants were in their senior *Realschule* school year. In the present analyses, only data from Cohorts 2 and 3 were used because primary control striving was assessed in a different format in Cohort 1 resulting in a final sample size of 464 (mean age in years = 16.8; 48.4% female). Parental consent was obtained for all study participants.

Measures

Positive affect. Positive affect during the last month was measured at all waves by the positive affect subscale of the PANAS (Watson et al., 1988; for example, “enthusiastic”; 1 = *not at all*, 5 = *very often*; 10 items; α s ranged from .79 to .84).

Negative affect. Negative affect during the last month was measured at all waves by the negative affect subscale of the PANAS (Watson et al., 1988; for example, “distressed”; 1 = *not at all*, 5 = *very often*; 10 items; α s ranged from .79 to .86).

Primary control striving. As in Study 1, primary control striving was measured by domain-specific versions of the OPS scale. Previous publications have shown the validity

of the career-related OPS measures (Haase et al., 2008; Tomasik et al., 2009). *Primary control striving for apprenticeship goals* was measured at all waves by 12 items tailored to the apprenticeship domain (SPC, e.g., “I invest all my energy to get a suitable apprenticeship position”; CPC, e.g., “If I fail to find a suitable position, I will look for unusual and new ways to succeed at last”). *Primary control striving for occupational future goals* was measured at all waves by 9 items tailored to the occupational future domain (SPC, e.g., “I invest all my energy to get a good occupational future”; CPC, e.g., “If I fail to get a good occupational future, I will look for new and unusual ways to succeed at last”). *Primary control striving for educational goals* was measured at all waves by 8 items tailored to the education domain (SPC, e.g., “I work hard to improve my achievement in school”; CPC, e.g., “If I fail in improving my school achievement I will ask others for help”). Items were presented on a 5-point scale (1 = *strongly disagree*, 5 = *strongly agree*). Internal consistencies of all primary control striving scales were satisfactory (α s at all waves ranged from .82 to .90).

Apprenticeship applications. At each wave, students reported whether they had written one or more applications for an apprenticeship since the prior wave, and if so, how many. The variable was treated as a continuous count variable at each wave.

Apprenticeship offers. At each wave, students reported whether they had received one or more offers for an apprenticeship since the prior wave, and if so, how many. The variable was treated as a continuous count variable at each wave.

Apprenticeship-related control beliefs. Apprenticeship-related control beliefs were measured at all waves by ability and effort agency beliefs from the CAMAQ scale used in Study 1. Internal consistency of this five-item measure was moderate (α s ranged from .71 to .75).

Design and Procedure. Study 2 used a dense longitudinal design with multiple waves of data collection before and after graduation. The present analyses draw from six waves: five waves assessed in 2-monthly intervals during the 10th grade, the senior school year of German *Realschule* students, and one wave scheduled approximately 2 months after graduation. Retention rates were acceptable (from Wave 1 to Wave 5 = 82%; from Wave 1 to Wave 6 = 58%). For Wave 1 to 5, students filled out written questionnaires during regular classroom hours while teachers were absent. These sessions were led by trained personnel and lasted approximately 90 min. Participants received a candy and a small token (value < US\$1) after completing the questionnaire. For Wave 6, questionnaires were mailed to students who completed them and mailed them back. These participants received monetary compensation equivalent to approximately US\$20.

Table 3. Study 2: Descriptive Statistics and Correlations for Study Variables, Averaged Across Waves ($N = 429$)

Variables	$M (SD)$	Correlations							
		1	2	3	4	5	6	7	8
1. Positive affect	3.54 (0.62)	—							
2. Negative affect	2.66 (0.70)	-0.07	—						
3. Control beliefs (apprenticeship)	3.80 (0.67)	0.33***	-0.16**	—					
4. Primary control striving (apprenticeship)	3.78 (0.69)	0.25***	-0.09	.54***	—				
5. Apprenticeship applications	7.35 (20.90)	0.07	-0.01	0.02	0.00	—			
6. Apprenticeship offers	0.43 (1.55)	0.07	0.07	0.10*	0.03	0.24***	—		
7. Primary control striving (occupational future)	3.95 (0.69)	0.23***	-0.09	0.48***	0.73***	-0.02	0.01	—	
8. Primary control striving (education)	3.66 (0.73)	0.26***	-0.08	0.44***	0.74***	0.02	0.04	0.67***	—

Note: * $p < .05$. ** $p < .01$. *** $p < .001$.

Results

Table 3 shows descriptive statistics and correlations for the study variables. As expected, apprenticeships were relatively scarce. At each wave, about 16.2% of participants could expect to receive an apprenticeship offer, and by the last wave of data collection analyzed here, only a slim majority (52.2%) had been offered an apprenticeship. As in Study 1, analyses were conducted longitudinally. Because Study 2 contained multiple waves, we used random-effects (multilevel) regressions, which represent the data as time points nested within individuals. Specifically, outcome variables were regressed on lagged values (values at time $t-1$) of predictors across all waves for which each participant contributed data.² These analyses were conducted using the *xtreg* module in Stata 9.0 (StataCorp, 2005). The standardized coefficients we report are based on standardized variables (i.e., computed with respect to the total variance on a given variable at a given wave).

Because control beliefs were assessed specifically with respect to the goal of obtaining an *apprenticeship*, our primary analyses examined the longitudinal associations between positive affect and outcomes in this domain. As a first step (Table 4, Model 1, first column), primary control striving was regressed on lagged primary control striving, positive affect, and negative affect. Lagged positive affect predicted primary control striving ($\beta = .11, p < .001$). Similar models (Table 4, Model 1, third and fifth column) examined the associations between lagged positive affect, and both efforts to obtain an apprenticeship (in the form of number of applications) and success in obtaining an apprenticeship (in the form of number of offers received). For the latter variable, random-effects Poisson regressions were used because of the relatively rare occurrence of apprenticeship offers at each wave. Lagged positive affect

marginally predicted the number of apprenticeship applications ($\beta = .04, p = .06$) and the number of apprenticeship offers ($\beta = .19, p = .003$).

As a second step, apprenticeship-related control beliefs were added to test for mediation (Table 4, Models 2). Sobel tests indicated that the indirect path in the postulated mediation model (i.e., mediation via control beliefs) was significant for the association between lagged positive affect and primary control striving (Sobel: $z = 2.89, p = .01$), whereas the indirect paths were not significant for associations between lagged positive affect and apprenticeship applications or offers. Lagged positive affect continued to predict primary control striving and apprenticeship offers. Moreover, the association between lagged positive affect and apprenticeship applications became fully significant.

As in Study 1, a set of follow-up analyses examined reverse associations with a special focus on primary control striving predicting subsequent positive affect. We found significant associations between lagged control beliefs and positive affect, controlling for lagged positive affect ($\beta = .09, p < .001$); between lagged primary control striving and control beliefs, controlling for lagged control beliefs ($\beta = .11, p < .001$); and between lagged primary control striving and positive affect, controlling for lagged positive affect ($\beta = .07, p < .01$). However, note that especially this last association was smaller than that for positive affect predicting primary control striving ($\beta = .11, p < .001$, see above). In addition, because Study 2 offered more data points to work with than did Study 1, an additional follow-up analysis used a fixed-effects model to determine whether the observed significant associations between positive affect and primary control striving could be attributed to actual within-person variability or were instead the result of individual differences. This model used lagged deviations from individuals'

Table 4. Study 2: Primary Control Striving for Apprenticeship, Apprenticeship Applications, and Apprenticeship Offers Regressed on Lagged Predictors ($N = 464$)

Lagged predictors	Primary control striving (apprenticeship) ^a		Apprenticeship applications ^a		Apprenticeship offers ^b	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Primary control striving (apprenticeship)	.49***	.42***	—	—	—	—
Apprenticeship applications	—	—	.36***	.39***	—	—
Apprenticeship offers	—	—	—	—	.07**	.04
Positive affect	.11***	.11***	.04 [†]	.08**	.19**	.21*
Negative affect	.02	.01	.01	-.03	.03*	.08*
Control beliefs (apprenticeship)	—	.09***	—	-.02	—	.01

Note: ^aStandardized random-effects regression coefficients (β s).

^bStandardized random-effects Poisson regression coefficients.

[†] $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

mean positive affect over time to predict deviations from individuals' mean primary control striving over time, controlling for lagged deviations in control striving and concurrent deviations in positive affect. Results of this model indicated that lagged positive affect predicted within-person increases in primary control strivings ($\beta = .04$, $p < .05$). By contrast, a separate analysis using deviations in positive affect as the outcome variable indicated that lagged primary control striving did not predict within-person change in positive affect ($\beta = -.02$, $p = .35$). Together, these findings further indicated that positive affect predicted subsequent primary control striving and that it did so more strongly than primary control striving predicting subsequent positive affect.

A final set of analyses tested whether positive affect would predict primary control striving for other goals. As a first step (Table 5, Models 1), primary control striving for occupational future and educational goals was regressed on lagged primary control striving, positive affect, and negative affect. Lagged positive affect predicted primary control striving for occupational future ($\beta = .08$, $p < .001$) and educational goals ($\beta = .11$, $p < .001$). As a second step, apprenticeship-related control beliefs were added to test for mediation (Table 5, Models 2). Sobel tests indicated that the indirect paths in the postulated mediation model (i.e., mediation via control beliefs) were significant for associations between lagged positive affect and primary control striving for occupational future (Sobel: $z = 3.20$, $p = .005$) and educational goals ($z = 3.20$, $p = .002$). Lagged positive affect continued to predict primary control striving for occupational future and educational goals.

In most analyses, negative affect did not emerge as a significant predictor. However, lagged negative affect predicted the number of apprenticeship offers (see Table 4).

Discussion

The results of Study 2 replicated key findings of Study 1 and extended them in important ways. First, lagged positive affect—assessed with a dedicated measure—predicted primary control striving for career and educational goals. Unlike Study 1, Study 2 used a sample outside the United States—increasing the external validity of the findings—and a six-wave longitudinal design. Study 2 also allowed us to test and partially replicate this finding in measures of real-world primary control striving and success: applying for and obtaining apprenticeships. The ability of positive affect to predict success in obtaining an apprenticeship suggests that it has implications beyond self-report measures of primary control striving.

As in Study 1, we examined the mediating role of control beliefs. In Study 2, mediation was partial and present for primary control striving but not apprenticeship applications and offers. This pattern of partial mediation suggests that mechanisms other than enhanced control beliefs may explain why positive affect enhances primary control striving. For example, positive affect repairs self-regulatory resources (Baumeister, Vohs, & Tice, 2007; Tice et al., 2007), which in turn may enhance primary control striving. Study 2 was conducted in a context that depletes self-regulatory resources (Poulin & Heckhausen, 2007): the search for an apprenticeship among German *Realschule* students. In this context, feedback is easily available in the form of rejections or offers in response to applications. However, this feedback is often negative, which means that individuals must guard against feelings of hopelessness and failure. Accordingly, the associations of positive affect with outcomes may go beyond perceptions of control to include emotion regulation and coping efforts.³ In this vein, it is notable that positive affect predicted both primary

Table 5. Study 2: Primary Control Striving in Multiple Domains Regressed on Lagged Predictors ($N = 464$)

Lagged predictors	Primary control striving (occupational future)		Primary control striving (education)	
	Model 1	Model 2	Model 1	Model 2
Primary control striving ^a	.49***	.51***	.59***	.57***
Positive affect	.08***	.07**	.11***	.11***
Negative affect	-.03	-.03	.02	.01
Control beliefs (apprenticeship)	—	.09***	—	.09**

Note: Standardized random-effects regression coefficients (β s).

^aSame goal domain as the outcome variable.

** $p < .01$. *** $p < .001$.

control striving and more “objective” career outcomes, such as numbers of applications or apprenticeship offers, but control beliefs appear to mediate this effect more for the former than the latter.

Again, we obtained mostly nil results for effects of negative affect predicting primary control striving. However, negative affect also predicted success in obtaining an apprenticeship, extending previous findings (Nagy, Köller, & Heckhausen, 2005).

General Discussion

Does happiness make people industrious or lazy? Building on the motivational theory of lifespan development (Heckhausen et al., 2010; Schulz & Heckhausen, 1998), we found that positive affect predicts primary control striving, that is, the motivation to invest time and effort and overcome obstacles in the pursuit of important life goals. In two longitudinal studies conducted in the United States and Germany, respectively, we demonstrated that positive affect predicted both self-report and objective measures of primary control striving for career and educational goals. Moreover, control beliefs partially mediated the longitudinal associations. We should note that the effect sizes were consistent with our hypothesis but small. Yet, small does not necessarily mean unimportant (see Rosenthal, 1990).

Positive Affect Predicts Primary Control Striving for Career and Educational Goals

Studies have repeatedly shown that primary control striving predicts many positive outcomes, both objective success as well as subjective benefits including positive affect (for a review, see Heckhausen et al., 2010). Few studies have examined the reverse association, despite the fact that primary control striving may itself rely on multiple resources, including positive affect. Our findings support

the notion that the motivational functions of positive affect are not limited to goal anticipation (e.g., Custers & Aarts, 2005) or feedback (e.g., Carver, 2003; Louro et al., 2007) but extend to goal engagement (i.e., primary control striving). Specifically, our longitudinal studies showed that positive affect predicted the pursuit of highly important real-world goals related to career and education, and that the predictive power of positive affect for primary control striving was even stronger than the more commonly examined reverse pattern. We hasten to add, however, that our results are not evidence that primary control striving does *not* predict positive affect. Rather, the relationship between positive affect and primary control striving may likely be bidirectional—reminiscent of other positive bidirectional relationships (e.g., Fredrickson & Joiner, 2002) suggesting an upward spiral of positive affect and primary control striving that could be further investigated in future studies (see Vohs & Baumeister, 2008). Future research may also investigate whether these findings generalize to other specific goal domains.

The findings further showed that control beliefs either partially or wholly mediated many of the longitudinal associations between positive affect and primary control striving. This suggests that one mechanism by which positive affect enhances primary control striving for goals is that positive affect may bias beliefs that these goals can be attained. This mediating role of control beliefs is consistent with propositions by the mood-as-information theory (Schwarz, 2012; Schwarz & Clore, 1983) and the self-efficacy theory (Bandura, 1997).

Our findings may provide a new perspective on resources that reduce or enhance primary control striving toward valued goals. Obstacles to goal pursuit such as stressful life circumstances (e.g., Poulin & Heckhausen, 2007) or health impairments (e.g., Hall, Chipperfield, Heckhausen, & Perry, 2010) are characterized by deficits in positive affect. This common feature may explain, in part, how these factors inhibit primary control striving—a possibility that should be addressed in future research. A role for positive affect in promoting control striving also has implications for possible interventions to bolster primary control striving. Techniques to increase positive affect are increasingly effective (e.g., Cohn & Fredrickson, 2010) and may have fewer unintended negative consequences than other interventions. For example, directly increasing control beliefs might lead to increased primary control striving but might lead to increased disillusionment and disappointment if goal failure occurs. By contrast, increased positive affect predicts not merely increased control striving but also greater ability to cope with setbacks and other life stressors (Folkman & Moskowitz, 2000).

Meta-analytic findings show that “happiness leads to success” (Lyubomirsky et al., 2005) in many life domains, including work (Boehm & Lyubomirsky, 2008). Various pathways may contribute to this effect (e.g., Folkman & Moskowitz, 2000; Fredrickson, 2001; Isen, 2001; King, Hicks, Krull, &

Del Gaiso, 2006). Our findings indicate that the effect of positive affect on primary control striving may be another pathway through which positive affect contributes to success, given that primary control striving promotes success in the same domains as those enhanced by positive affect (for a review, see Heckhausen et al., 2010). Thus, the adaptiveness of positive affect may extend beyond broadening and building thought and action repertoires (Fredrickson, 2001), coping (Folkman & Moskowitz, 2000), and decision making (Isen, 2001). Positive affect may be fuel for persistent goal engagement.

However, it is important to note that persistence is not uniformly adaptive. Goals sometimes cannot be attained no matter how hard one tries (e.g., Heckhausen, Wrosch, & Fleeson, 2001; Wrosch, Scheier, Carver, & Schulz, 2003). Thus, positive affect may have a “dark side” (Gruber, Mauss, & Tamir, 2011) when it leads to escalating commitment and dysfunctional persistence in situations where it would be more adaptive to let go of unattainable goals and move on.

Limitations and Implications for Future Research

The present studies have limitations that have implications for future research. First, we examined incidental affect without reference to the source of that affect. It is likely that not all positive affect is the same. In particular, positive affect that stems from goal anticipation, progress, or attainment—as opposed to incidental positive affect—may have very different effects on primary control striving. The control-process model proposes that positive affect that stems from goal progress leads to *reductions* in primary control striving with regard to that goal (Carver, 2003; Carver & Scheier, 1998). Future studies may thus compare effects of goal-related and goal-unrelated positive affect.

Second, the present studies assessed positive affect rather high in arousal (Watson et al., 1999). A growing body of evidence indicates that low-arousal positive affect may have quite different effects than high-arousal positive affect (for an example study, see De Dreu, Baas, & Nijstad, 2008). Thus, it is also possible that the primary control striving-reducing effect of positive affect proposed by Carver and colleagues (e.g., Carver, 2003) will be found for positive affective states characterized by low arousal, such as feelings of contentment. In a related vein, it is possible that positive affect at a very high level ceases to motivate primary control striving, akin to what Oishi, Diener, and Lucas (2007) observed for the association between life satisfaction and numerous outcomes of success such as income. In a follow-up analysis, we explored nonlinear (i.e., quadratic) effects of positive affect on primary control striving and did not find significant effects. Yet, future research may systematically compare the effects of positive affect varying in arousal, frequency, and intensity.

Third, our assessments of positive affect referred to the previous week or month and, thus, were possibly less

accurate than momentary assessments (Kahneman, Diener, & Schwarz, 1999). Ideally, one would have measured momentary positive affect repeatedly using an experience sampling method (e.g., Stone, Shiffman, & DeVries, 1999) and used the average of these repeated assessments to predict primary control striving over time.

Fourth, we found that control beliefs mediated the effects of positive affect on primary control striving. Mediation was partial and not present for all outcomes. Clearly, other mediating pathways merit further investigation including noncognitive (e.g., repair of self-regulatory resources; Baumeister et al., 2007; Tice et al., 2007) as well as other cognitive (e.g., future temporal focus; Foo et al., 2009) mediators.

Finally, although we assessed negative affect, it was only examined for exploratory purposes and yielded mostly nil results. Future research may examine how different negative emotions predict primary control striving (Carver, 2004).

Conclusion

Does happiness function as a motivator? The present studies show that positive affect predicts primary control striving for career and educational goals and that control beliefs partially mediate this effect. Thus, when individuals experience positive affect, they become more motivated to invest time and effort and overcome obstacles when pursuing their goals, in part because they believe they have more control over attaining their goals.

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Notes

- Analyses were also conducted using two truncated measures of positive affect (i.e., a two-item measure using the “happy” and

- “enjoyed life” items, $\alpha = .76$; a one-item measure using just the “happy” item). Results were very similar to those using the four-item measure of positive affect but with somewhat smaller effect sizes for the association between positive affect and primary control striving (for the two-item measure, $\beta = .10$, $p < .05$; for the one-item measure, $\beta = .08$, $p < .05$). As the results were very similar and to facilitate comparison to prior literature, we decided to focus on the four-item measure of positive affect.
- Other time lags (e.g., $t-2$, $t-3$, $t-4$) were examined, but results indicated that the predictive power of positive affect decreased with greater lags. For example, positive affect predicted apprenticeship control strivings more at lag $t-2$ ($\beta = .08$, $p < .01$) than at lag $t-4$ ($\beta = .05$, $p > .05$); a similar pattern held for other outcome variables.
 - The role of positive affect in emotion regulation might suggest that positive affect should buffer the effects of negative affect on primary control striving. However, follow-up analyses showed that positive affect \times negative affect had no interactive effects on primary control striving in both studies ($ps > .05$). Thus, instead of positive and negative affect interacting in their effect on primary control striving, it seems plausible that positive affect facilitates primary control striving in part by *preventing* the occurrence of negative affect, for example, by encouraging positive appraisals of disappointing experiences.

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