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The Upward Spiral of Adolescents' Positive School Experiences and Happiness: Investigating

Reciprocal Effects over Time

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Abstract

In line with self-determination theory and Fredrickson's (2001) broaden-and-build theory of

positive emotions, this study adopts a positive perspective on students' school experiences

and their general psychological functioning. The reciprocal effects of positive school

experiences and happiness, a dimension of affective well-being, are examined over the course

of an academic year. Data were collected from 215 secondary school students at 5

measurement occasions. The results of longitudinal cross-lagged structural equation

modeling support the notion of an upward spiral of positive school experiences and happiness

over time. Positive school experiences had a stable lagged effect on happiness, and, in turn,

happiness had a lagged effect on future positive school experiences.

Keywords: school experiences, subjective well-being, happiness, broaden-and-build theory,

self-determination theory, adolescents, longitudinal

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The recent shift from a focus on problems and deficits to a more positive perspective, with an emphasis on strengths and resilience, has also become increasingly popular in educational research (e.g., Kristjánsson, 2012; Seligman, Ernst, Gillham, Reivich, & Linkins, 2009; Sin & Lyubomirsky, 2009). In addition to looking at diverse objectionable consequences of negative school experiences, such as the involvement in school violence or bullying (Harel-Fisch et al., 2011; Kasen, Berenson, Cohen, & Johnson, 2004), the development of depressive symptoms (Loukas & Murphy, 2007) or various addictive behaviors (Nutbeam, Smith, Moore, & Baumann, 1993; Sellström & Bremberg, 2006), school psychologists have increasingly begun to adopt a more positive view and acknowledge potential desirable outcomes of *positive* school experiences (Chafouleas & Bray, 2004; Terjesen, Jacofsky, Froh, & DiGiuseppe, 2004).

Most of this "positively oriented" research has focused on the effects of students' positive school experiences on academic outcomes, such as school engagement and academic achievement (Patrick, Ryan, & Kaplan, 2007; Roeser, Eccles, & Sameroff, 1998; Samdal, Wold, & Bronis, 1999; Sellström & Bremberg, 2006). However, research on the relevance of positive school experiences for students' *general* adjustment is far less prevalent. Moreover, although some authors have linked positive school experiences to higher levels of resilience or subjective well-being (Baker, Dilly, Aupperlee, & Patil, 2003; Danielsen, Samdal, Hetland, & Wold, 2009; You, Furlong, Felix, Sharkey, & Tanigawa, 2008), the temporal sequence of effects remains ambiguous due to the predominance of cross-sectional study designs. It is not clear whether positive school experiences promote positive subjective well-being or whether students with higher levels of positive subjective well-being evaluate their school environment more positively.

The present study contributes to current positive research efforts in school psychology by examining the longitudinal relation between positive school experiences and subjective well-being as an indicator of general psychological functioning. Based on Deci and Ryan's (1985; Ryan & Deci, 2000) self-determination theory and Fredrickson's (2001) broaden-and-build theory, it is investigated whether positive school experiences and happiness—an aspect of subjective well-being—are reciprocally connected and create an "upward spiral" over time, in a way that positive school experiences lay the foundation for future happiness, which, in turn, facilitates future positive school experiences.

Positive School Experiences and Subjective Well-Being

The concept of *school experiences* is rather elusive and has been defined and measured in manifold ways (cf. Baker et al., 2003; Libbey, 2004; Suldo, Riley, & Shaffer, 2006). Some authors take a rather broad view by assessing either school satisfaction (Rask, Astedt-Kurki, Tarkka, & Laippala, 2002; Samdal, Nutbeam, Wold, & Kannas1998) or an aggregate of several school-related factors that define, for example, school ethos (Rutter, 1983), school culture (Hargreaves, 1995), school climate (Loukas & Morphy, 2007), school connectedness (You et al., 2008), or school well-being (Konu & Rimpelae, 2001). Others address more specific dimensions of school experiences, such as teacher–student relationships (Baker, 1999), social support at school (Patrick et al., 2007), sense of community (Battistich & Hom, 1997), or perceived academic performance or competence (Suldo & Huebner, 2006). Although there is no consensus regarding the precise definition and measurement of school experiences, most authors agree that students' experiences in school mediate the actual effects of the school environment on various outcomes (Roeser et al., 1998; Roeser, Eccles, & Sameroff, 2000), such as subjective well-being.

Subjective well-being is an important aspect of general psychological functioning and consists of two major components (Diener, 1994; Lucas, Diener, & Suh, 1996): a cognitive

and an affective component. The cognitive component represents an individual's cognitive–evaluative judgment of his or her life as a whole (e.g., life satisfaction), whereas the affective component reflects an individual's feelings and moods. The latter, affective well-being, includes two distinct aspects emphasizing either the positive or negative dimension of affect (Diener, Napa Scollon, & Lucas, 2003; Ryff & Keyes, 1995), indicated by the absence of unpleasant (e.g., emotional distress) or the presence of pleasant emotions (e.g., happiness).

There are few studies linking subjective well-being to indicators of *positive* school experiences. For example, happiness, an indicator of affective well-being, has been linked to perceived social support at school (Natvig, Albrektsen, & Qvarnstrøm, 2003). You and colleagues (2008) also reported a significant positive relation between adolescents' life satisfaction, an indicator of cognitive well-being, and school connectedness (e.g., feeling fairly treated by teachers or feeling close to classmates). Similar positive relations with different measures of cognitive well-being have been identified for perceived academic self-efficacy (Suldo & Huebner, 2006), perceived academic competence (Huebner, Gilman, & Laughlin, 1999), perceived academic performance (Leung, McBridge-Chang, & Lai, 2004), perceived social support from teachers and classmates (Suldo & Huebner, 2006), and also overall satisfaction with school (Danielsen et al., 2009; Rask et al., 2002). In line with these results, Vieno, Santinello, Galbiati, and Mirandola (2004) identified teacher and classmate support as important antecedents of adolescents' satisfaction with school, which, in turn, was related to subjective well-being. Similarly, a large international study on juvenile health behavior attributed adolescents' life satisfaction to school adjustment (perceived academic performance and positive feelings about school) and to the social climate at school (Ravens-Sieberer, Freeman, Kokonyei, Thomas, & Erhart, 2009).

On the whole, overall evaluations of school experiences (e.g., general school satisfaction) and specific dimensions of school experiences (e.g., social support at school)

seem to be mutually related to subjective well-being. However, as most studies used a cross-sectional research design, the interpretation of the direction of these effects is questionable. It is not clear whether positive school experiences promote positive subjective well-being or, rather, whether students with higher levels of positive subjective well-being evaluate and experience school more positively. To clarify the temporal sequence of positive school experiences and positive subjective well-being, longitudinal studies are necessary. However, such studies are scarce and, if available, usually have a deficit perspective: For example, in a longitudinal study on perceived school climate and general psychological adjustment, Loukas and Murphy (2007) used adjustment problems, such as depressive symptoms, as the main outcome measures. Even Roeser and colleagues (1998), who found that school perceptions and experiences predicted emotional functioning over time, did not adopt an entirely positive perspective, because they operationalized emotional functioning as lack of emotional distress.

Moreover, existing results on the relation between positive school experiences and subjective well-being almost exclusively refer to the cognitive component of well-being, whereas affective well-being has been somewhat neglected. The lack of research on affective well-being from a positive perspective is rather unfortunate, because affective well-being is more variable than cognitive well-being and, as such, likely to be more strongly affected by variations in school experiences (cf. Diener et al., 2003). Furthermore, affective well-being and cognitive well-being, despite being significantly associated, are often linked to markedly different causes and consequences (cf. Kahneman & Deaton, 2010; Schimmack, Schupp, & Wagner, 2008). For example, negative life events such as bereavement or the unexpected loss of employment have a stronger effect on cognitive well-being, whereas other life events such as childbirth primarily lead to an increase in the affective component of well-being (Luhmann, Hofmann, Eid, & Lucas, 2012). The present study therefore examines the pattern

of the relation between positive school experiences and positive affective well-being (i.e.,

happiness), in a longitudinal design.

Do Positive School Experiences Lead to Happiness?

Cross-sectional results are usually interpreted as indicating an effect of positive school

experiences on well-being over time, rather than the other way around (e.g., Suldo et al.,

2006). Support for this interpretation is derived from self-determination theory (Deci &

Ryan, 1985; Reeve, 2004). Self-determination theory states that individuals have three

fundamental developmental needs (Deci & Ryan, 1985; Ryan & Deci, 2000): the needs for

relatedness, competence, and autonomy. The satisfaction of these needs is essential for an

individual's psychological growth and well-being (Deci & Ryan, 2000; Ryan & Deci, 2000).

Typically, individuals seek to satisfy these needs through interaction with their environment.

Thus, if students feel meaningfully connected to and accepted by teachers and classmates—

that is, if they have supportive relationships with others at school—their need for relatedness

will be satisfied. If students feel that they can meet the challenges at school (e.g., homework

and exams), they will experience a sense of personal competence. Moreover, if they have

freedom of choice and are free to pursue their own interests and values at school (for example,

by choosing between different subjects and deciding on a topic of personal interest) students

will experience satisfaction of their need for autonomy. If the school provides experiences

that support satisfaction of these three fundamental needs (a.k.a., "positive school

experiences"), students' mental health and well-being will improve (Reeve, 2004; Roeser et

al., 1998).

In line with this reasoning, numerous studies have directly or indirectly conceptualized

school experiences against the background of self-determination theory (cf. Reeve, 2004;

Roeser et al., 1998). For example, McLaughlin and Clarke (2010) demonstrated that school

environments that allow for positive and supportive relationships with teachers and

classmates (need for relatedness) go along with better mental health. Similarly, school environments that support students' perceived academic self-efficacy and competence (need for competence) have been related to better general well-being (e.g., Huebner et al., 1999; Suldo & Huebner, 2006). Furthermore, also school environments that provide opportunities for students to participate in decision-making processes and to learn material that is interesting and relevant to them (need for autonomy) have been shown to be important for students' positive adjustment (e.g., Miserandino, 1996; Reeve, 2004). Accordingly, in the present longitudinal study, positive school experiences reflect the degree to which these basic needs are satisfied and, consequently, are expected to be positively related to students' overall happiness over time.

Does Happiness Lead to Positive School Experiences?

Although subjective well-being has been investigated predominantly as an outcome of various intra-individual and situational factors (cf. Diener, Suh, Lucas, & Smith, 1999), there is also reason to assume that well-being itself, particularly the positive dimension of affective well-being (e.g., happiness), has further desirable consequences. Fredrickson's (2001) broaden-and-build theory of positive emotions takes such an approach. According to this theory, positive emotions such as joy, interest, or contentment broaden a person's thought–action repertoire, whereas negative emotions narrow the range of percepts, thoughts, and actions presently in mind. Thus, in contrast to negative emotions, positive emotions lead to a wider-than-usual range of percepts, thoughts, and actions and thereby promote cognitive and behavioral flexibility, creativity, and the ability to identify available opportunities. Most importantly, broadened thought–action repertoires help build enduring physical, psychological, intellectual, and social resources; these personal resources, in turn, increase the experience of positive emotions and well-being over time (Cohn, Fredrickson, Brown, Mikels, & Conway, 2009; Fredrickson, Cohn, Coffey, Pek, & Finkel, 2008; Fredrickson &

Joiner, 2002; Lyubomirsky, 2001). In other words, positive emotions, broadened thought–action repertoires, personal resources, and emotional well-being are reciprocally connected. As a consequence, positive emotions trigger an "upward spiral" towards well-being over time (Cohn & Fredrickson, 2009).

Laboratory studies support the assumptions of the broaden-and-build model that positive affect can expand thought–action sequences and facilitate recovery from negative affect (e.g., Fredrickson & Joiner, 2002; Isen, 2000; 2002). For example, Fredrickson and Branigan (2005) found that experimentally induced positive emotions increased individuals' scope of visual attention and repertoires of desired actions. Induced positive emotions also enhanced individuals' creativity (Rowe et al., 2007) as well as their sense of others (Waugh & Fredrickson, 2006). Furthermore, mild positive emotions were found to be beneficial in the process of cardiovascular recovery from negative emotions, such as anxiety (Fredrickson & Levenson, 1998; Fredrickson, Mancuso, Branigan, & Tugade, 2000). In general, when people are in a positive mood, they are more open to information (Estrada, Isen, & Young, 1997), more flexible in their thinking (Ashby, Isen, & Turken, 1999), and better able to integrate diverse material (Isen, 1990); they evaluate situations more favorably, and they think, feel, and act in ways that promote resource building (Elliot & Thrash, 2002; Lyubomirsky, 2001).

Moreover, in a recent longitudinal study, Fredrickson and colleagues (2008) demonstrated that experimentally induced positive emotions increased an individual's personal resources which, in turn, enhanced individual subjective well-being. Similarly, in a comprehensive meta-analysis of positive affect and success across life domains, Lyubomrisky, King, and Diener (2005) conclude that happiness—defined as the frequent experience of positive emotions—not only results from various successful outcomes, such as social relationships, health and well-being, or problem solving, but also precedes and enhances them. In line with Fredrickson (2001) and Carver (2003), they argue that happiness

implies the feeling that life is going well, so that happy people have the advantage that they can take their time to build new resources and work actively towards new goals.

Although a considerable amount of recent research provides evidence for the broaden-and-build theory, its application to the field of school psychology is not well established. Reschly, Huebner, Appleton, and Antaramian (2008) are among the few who have applied the broaden-and-build theory to the educational context, demonstrating that students' positive emotions are related to adaptive coping, which, in turn, is associated with increased student engagement. In addition, a recent longitudinal study (Suldo, Thalji, & Ferron, 2011) showed that subjective well-being could be used to predict students' grade point average one year later.

In conclusion, the broaden-and-build model offers an important extension to current interpretations of the relation between positive school experiences and subjective well-being as derived from self-determination theory (Deci & Ryan, 1985; Ryan & Deci, 2000). According to self-determination theory, school experiences that allow students to satisfy fundamental psychological needs are beneficial for their psychological growth and well-being; thus, self-determination theory proposes a unidirectional relation between positive school experiences and happiness. However, following the broaden-and-build theory, happiness itself is supposed to facilitate approach behavior and thereby lead to more positive school experiences. Thus, the broaden-and-build theory moves from the assumption of a solely unidirectional relation between positive school experiences and happiness (as derived from self-determination theory) to that of a reciprocal relation.

The Present Study

The present longitudinal study extends previous findings on subjective well-being in school by combining two separate theoretical lines of research. First, in accordance with self-determination theory (Deci & Ryan, 1985; Ryan & Deci, 2000), it is expected that positive

school experiences promote happiness, a dimension of affective subjective well-being, by satisfying basic needs. Second, following the broaden-and-build theory (Fredrickson, 2001), it is argued that happiness makes it possible to experience school more positively, by broadening thought–action repertoires. As a result, positive school experiences and happiness are reciprocally connected and should create an upward spiral over time.

In contrast to previous studies that, for the largest part, examined determinants of cognitive well-being (e.g., life satisfaction), the present study focuses on the positive dimension of affective well-being, happiness (Diener, 1994), for two reasons. On the one hand, affective well-being is less stable than cognitive well-being and more sensitive to changing life circumstances (for example, varying school experiences; cf. Diener et al., 2003); on the other hand, the focus of the broaden-and-build theory (Fredrickson, 2001) is on positive emotions and thus on positive affective rather than on cognitive well-being.

Using five waves of data collected over a period of one academic year, two hypotheses are tested with a sample of secondary school students:

Hypothesis 1. Positive school experiences are positively related to future happiness.

Hypothesis 2. Happiness is positively related to future positive school experiences.

Only when *both* hypotheses are supported is evidence for an upward spiral of positive school experiences and happiness over time apparent.

Method

Participants and Procedure

Procedure. The study was part of a five-wave research project on student well-being. The first wave (T1) was conducted 2 months after the beginning of the new school year (in November) and the last wave (T5) at the end of the school year (in June); the time lag between successive waves was approximately 2 months. All participants were members of an academic online panel for youth research, including students from secondary schools in rural

and urban areas in Austria. The panel was established in 2009, and the panelists were recruited in accordance with national laws and ethical standards from all over the country (cf. Stiglbauer, Gnambs, & Gamsjäger, 2011). Participants were invited by email to complete online questionnaires five times during the school year. Their participation was voluntary and rewarded with tickets in a lottery with various small prizes (e.g., free cinema tickets).

Response rate. A sample of 393 students (69.6% female) participated in the present study. The response rates at the five measurement occasions ranged between 52% and 72%, which was rather high as compared to typical online surveys (e.g., Couper & Miller, 2008; Hiskey & Troop, 2002). Sixty-four participants had to be excluded from the analyses because of a large amount of missing data (more than 5%; Little & Rubin, 1987) or because they dropped out of school during the research period. Of the remaining 329 students, 114 participated only once and hence were not included in the longitudinal analyses presented here. Thus, the final longitudinal sample comprised 215 students (164 females); 43% of them participated at two, 17% at three, and 13% at four measurement occasions, and 27% participated at all five measurement occasions. Table 1 provides a detailed description of the sample in terms of the socio-demographic characteristics of the participants.

Attrition analysis. To rule out a systematic bias due to nonresponse, the final longitudinal sample was compared to the sample of 114 students who participated only once with regard to various socio-demographic characteristics (see Table 1) and the focal variables in the study, initial level of positive school experiences, $t(327) = 0.57$, $p = .570$, and initial level of happiness, $t(327) = 0.19$, $p = .847$. Neither variable showed a statistically significant effect. Moreover, frequency of participation (two to five times) was neither significantly related to any of the socio-demographic characteristics (see Table 1) nor to the focal variables, initial level of positive school experiences, $F(3, 211) = 1.33$, $p = .266$, and initial level of

happiness, $F(3, 211) = 1.07$, $p = .362$. Hence, it is unlikely that the dropout rate could have introduced a systematic bias.

Measures

Positive school experiences. Positive school experiences were measured with 13 items adapted from Eder (2007; 2010), which were also used as a measure of positive school experiences in PISA 2009 in Austria ("Schulbefindensindex"). These items cover the three fundamental developmental needs according to self-determination theory (Deci & Ryan, 1985; Ryan & Deci, 2000): (1) students' relationships with teachers and other students (need for relatedness), (2) meeting challenges at school (need for competence), and (3) students' perceived freedom to act in accordance with their interests and values (need for autonomy). Items measuring need for relatedness were, for example, "I have a good relationship with many teachers" and "My classmates stick with me when it matters." Items such as "I can meet challenges at school with ease" and "I often cannot follow the lessons" (reverse scored) indicated need for competence. Items measuring need for autonomy included, for example, "Most things offered in school are interesting and useful to me" and "School is important to me." Responses were indicated on a 4-point rating scale (1 = *completely true*; 4 = *not true at all*) and averaged across the 13 items; responses were recoded so that high scores indicate positive school experiences. The internal consistency reliability of the scale was good at all five occasions, with all Cronbach's α values > .80 (see Table 2).

Happiness. Happiness was assessed using the WHO-5 Well-being Index (World Health Organization, 1998), which has been shown to be a reliable measure of positive affective well-being of adolescents (e.g., Bech, Olsen, Kjoller, & Rasmussen, 2003; de Wit, Pouwer, Gemke, Delemarre-van de Waal, & Snoek, 2007). This scale includes five positively worded items that cover positive mood, vitality, and general interest over the last 2 weeks (e.g., "Over the last two weeks I have felt cheerful and in good spirits"). Responses were

scored on a 6-point rating scale indicating the frequency but not the intensity of positive affect

(0 = *at no time* to 5 = *all of the time*). For the measurement of individuals' overall level of

affective well-being, frequency measures such as the WHO-5 Well-being Index have been

shown to be theoretically and empirically superior to intensity measures (Diener, Sandvik, &

Pavot, 1991; Schimmack & Diener, 1997). Reponses were averaged across the five items;

thus, high scores indicate greater happiness. The reliability of the scale was good at all

occasions, with all Cronbach's α values ≥ .80 (see Table 2).

Statistical Analyses

The hypothesized longitudinal effects of positive school experiences and happiness

were analyzed by structural equation modeling (SEM) using AMOS 17.0 software (Arbuckle,

2008) with a full information maximum likelihood estimator. The selected estimator also

accounts for data missing at random (Arbuckle, 1996) and results in unbiased parameter

estimates with missing values up to 50% (Enders & Bandalos, 2001; Newman, 2003).

Furthermore, with a sufficiently large sample size of more than 200, the present data meet

standard requirements for latent variable modeling (see Barrett, 2007).

All variables were modeled as latent constructs with three indicators each (see Figure

1). In light of the rather complex model to be tested (particularly, relative to the

comparatively small sample size), we created item parcels for each construct. Item parceling

has the important advantage of producing more parsimonious models as compared to models

using item-level data. For positive school experiences, items were combined into three

parcels following the internal-consistency approach (Kishton & Widaman, 1994) that has the

advantage of keeping the multidimensional nature of the construct. Thus, one parcel reflects

the mean of the four items measuring the need for relatedness, another parcel is composed of

the four items measuring the need for competence, and the last parcel is composed of the five

items measuring the need for autonomy (see Figure 1a). Items measuring happiness were

parceled following the item-to-construct balance technique, which has been suggested as the optimal technique for uni-dimensional constructs (Little, Cunningham, Shahar, & Widaman, 2002). Two parcels are composed of two items each, and one parcel includes a single item (see Figure 1b).

Longitudinal effects were analyzed in two steps: First, longitudinal confirmatory factor analyses (CFA) were used to determine the measurement invariance of the constructs over time; then, five cross-lagged models (see Figure 2) were specified to test the hypothesized longitudinal effects.

Longitudinal confirmatory factor analysis (CFA). For meaningful interpretations of latent constructs, measurement models must be invariant over time (Little, Preacher, Selig, & Card, 2007; Vandenberg & Lance, 2000). If the factor structure remains stable and does not change, the latent constructs can be compared across measurement waves. Longitudinal factorial invariance was tested separately for positive school experiences and happiness by comparing a model with factor loadings for a given parcel constrained to be equal over time to a model without equality constraints (cf. Little et al., 2007). Following current recommendations (Little et al., 2007; Pitts, West, & Tein, 1996), these models also included autocorrelations among the residuals of a given parcel, which accounts for the systematic variance associated with each parcel. The measurement models are shown in Figure 1.

Cross-lagged model testing. In the cross-lagged analyses, positive school experiences and happiness were modeled as latent constructs with factor loadings for each indicator constrained to be equal across the five time points (cf. Little et al., 2007; Pitts et al., 1996). Five competing models were tested to investigate the proposed cross-lagged effects (see Figure 2). Model 1 (*stability model*) included only synchronous correlations between the constructs and their temporal stabilities but no cross-lagged paths. The temporal stabilities were specified as correlations between the corresponding constructs at the five measurement

points, estimating the total stability without decomposing the variance in direct and indirect effects (see Pitts et al., 1996). Models 2 and 3 were used to test Hypotheses 1 and 2 jointly and thus the upward-spiral of positive school experiences and happiness. Model 2 (*reciprocal model*) extended Model 1 by including reciprocal cross-lagged paths between positive school experiences and happiness, and Model 3 additionally constrained these cross-lagged paths to be invariant over time, thus testing the stability of direction and strength of the cross-lagged effects over time. To demonstrate the relevance of both cross-lagged paths, Models 4 and 5 included the cross-lagged paths in one direction only: Model 4 (*causality model*) included only the cross-lagged paths from positive school experiences to happiness (Hypothesis 1), whereas Model 5 was used to test the reverse causality (*reverse causality model*) with only cross-lagged effects from happiness to positive school experiences (Hypothesis 2). Initially, several socio-demographic variables (as reported in Table 1) had also been included as covariates; however, because these variables did not affect the results, they were excluded from the final analyses.

Model evaluation. The model fit was evaluated using the χ^2 goodness-of-fit statistic and a combination of the Comparative Fit Index (CFI), the Tucker Lewis Index (TLI), and the Root Mean Square Error of Approximation (RMSEA). In accordance with conventional standards (Hu & Bentler, 1999; Schermelleh-Engel, Moosbrugger, & Müller, 2003), CFI > .95, TLI > .90 and RMSEA < .06 were considered indicative of well-fitting models. Fit of nested models were compared using χ^2-difference tests; additionally, Akaike's Information Criterion (AIC) was used as a descriptive measure, with smaller AIC values indicating superior models.

<div align="center">

Results

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Table 2 summarizes the means, standard deviations, and zero-order correlations of positive school experiences and happiness for the five waves. As expected, positive school

experiences and happiness were positively correlated, both at a given measurement occasion as well as across measurement occasions.

Longitudinal Measurement Invariance

The unconstrained longitudinal CFAs for positive school experiences, $\chi^2 = 57.52$, $df = 50$, $p = .217$, CFI $> .99$, TLI $= .99$, RMSEA $= .03$, and for happiness, $\chi^2 = 71.40$, $df = 50$, $p = .025$, CFI $= .99$, TLI $= .98$, RMSEA $= .05$, showed good fit to the data. Constraining the factor loadings to be invariant over time did not result in a significant loss of fit, neither for positive school experiences, $\Delta\chi^2 = 12.45$, $\Delta df = 8$, $p = .132$, nor for happiness, $\Delta\chi^2 = 3.01$, $\Delta df = 8$, $p = .934$. Thus, longitudinal factorial invariance was supported for both measures; the meanings of the latent constructs did not change significantly over time.

Cross-Lagged Effects

Given longitudinal factorial invariance, five competing models with time-invariant factor loadings were used to test the proposed cross-lagged effects (see Figure 2). Table 3 summarizes the goodness of fit of the five models and the results of the nested model comparisons. The baseline Model 1, which included only stability coefficients but no cross-lagged paths, provided an acceptable fit to the data, $\chi^2(336) = 556.57$, $p < .001$; AIC $= 874.57$, CFI $= .935$, TLI $= .910$, RMSEA $= .055$. However, including reciprocal cross-lagged paths between positive school experiences and happiness (Model 2), $\chi^2(328) = 508.98$, $p < .001$; AIC $= 842.98$, CFI $= .947$, TLI $= .925$, RMSEA $= .051$, provided a significantly better fit, $\Delta\chi^2$ $(8) = 47.59$, $p < .001$. Moreover, constraining these cross-lagged paths to be equal over time (Model 3), $\chi^2(334) = 515.31$, $p < .001$; AIC $= 837.31$, CFI $= .947$, TLI $= .926$, RMSEA $= .050$, did not result in a loss of fit, $\Delta\chi^2$ $(6) = 6.32$, $p = .388$. This result indicates that the cross-lagged paths did not differ significantly in direction and strength over the five measurement waves. To demonstrate the importance of cross-lagged paths in both directions, Model 4 included only cross-lagged paths from positive school experiences to happiness,

$\chi^2(335) = 523.39$, $p < .001$; AIC = 843.39, CFI = .945, TLI = .923, RMSEA = .051, whereas

Model 5 included only cross-lagged paths from happiness to positive school experiences,

$\chi^2(335) = 545.77.31$, $p < .001$; AIC = 865.77, CFI = .938, TLI = .914, RMSEA = .054.

However, both models provided a significantly worse fit to the data than Model 3 with both

cross-lagged effects, $\Delta\chi^2(1) = 8.08$, $p = .004$, and $\Delta\chi^2(1) = 30.46$, $p < .001$, respectively. In

other words, in line with the hypothesis of an upward spiral of positive school experiences

and happiness, models that constrained one of the cross-lagged paths to zero resulted in

significantly worse fits to the data. Thus, the *reciprocal model* (Model 3) with both cross-

lagged paths was the best-fitting model.

Both happiness, $\bar{r} = .86$ ($SD_r = .18$), and positive school experiences, $\bar{r} = .62$ ($SD_r =$

.12), showed high temporal stability in the stability model (Model 1). Furthermore, in line

with Hypothesis 1, positive school experiences had a significant cross-lagged effect on

happiness over a school year, $B = 0.76$, $SE = 0.12$, $p < .001$, $\beta = [.37, .41]$, and happiness had

also a significant, yet weaker, stable effect on positive school experiences, $B = 0.09$, $SE =$

0.03, $p < .001$, $\beta = [.16, .18]$, supporting Hypothesis 2 (see Figure 3). Please note that the

standardized path coefficients are not exactly equal over time, because the unstandardized

path coefficients were constrained to be invariant over time whereas the factor variances (and

thus, the standardized coefficients) were not (cf. Cole & Maxwell, 2003).

Discussion

The present longitudinal study adopted a positive perspective on school experiences

and the general psychological functioning of students and described an upward spiral of

positive school experiences and happiness. In line with two prevalent theoretical approaches

(Deci & Ryan, 1985; Fredrickson, 2001), it was shown that positive school experiences

promoted happiness over time (Hypothesis 1) and, in turn, happiness facilitated positive

school experiences (Hypothesis 2). The positive relations between positive school

experiences and happiness corroborate previous findings that related several indicators of well-being to the experience of social support at school (e.g., Natvig et al., 2003; Suldo & Huebner, 2006; Vieno et al., 2004) or perceived academic competence and performance (e.g., Huebner et al., 1999; Leung et al., 2004; Ravens-Sieberer et al., 2009). However, the present results extend these cross-sectional findings in two important ways. First, the longitudinal design allows for conclusions regarding the temporal sequence of the constructs, which was not possible in most previous studies. The results demonstrated that positive school experiences have a positive effect on happiness over time. Second, the results demonstrate that investigating subjective well-being (or, in this case, happiness) exclusively as an outcome falls short in many applied settings. In fact, happiness itself has further important implications. For example, in the present study, happiness had a significant, albeit weaker, lagged effect on positive school experiences.

The reciprocal relation between positive school experiences and happiness is in line with assumptions derived from the broaden-and-build theory (Fredrickson, 2001): If individuals experience positive emotions, their thought–action repertoire will expand, which can be manifest in approach behavior, openness to and integration of information, and resource building (Estrada et al., 1997; Fredrickson, 2001). In other words, in such a positive state (as indicated by high levels of happiness), students are likely to engage in approach behavior, grasp opportunities as they arise, and, consequently, experience school more positively. In turn, these positive experiences contribute to future happiness, leading to an upward spiral of positive school experiences and happiness over time.

The temporal stability of the two constructs and their cross-lagged effects were both rather stable throughout the academic year. The mean stability coefficient of happiness was similar in magnitude to the stability coefficients of subjective well-being reported in previous studies, which indicates that well-being is not only determined by situational factors but also

has trait-like properties (see Diener et al., 2003, for an overview). The fact that the temporal stability of positive school experiences was even higher is less surprising, as the school environment was not expected to change significantly within one academic year. Despite the high stability of both constructs, positive school experiences and happiness are not insensitive to change, which is also indicated by the presence of significant cross-lagged effects. The lagged effects between positive school experiences and happiness did not change considerably throughout the academic year. However, it should be noted that the effect of happiness on positive school experiences was weaker than the reverse effect. Thus, it might be speculated that the contributions of positive school experiences and happiness to the upward spiral are not equally significant.

Limitations and Future Research

Three aspects that could limit the generalizability of the presented results should be noted. First, the results are limited to the specific operationalizations of general psychological functioning and school experiences adopted in this study. Happiness represents the positive dimension of affective well-being and, as such, is only one indicator of general psychological functioning. Positive school experiences were viewed from the perspective of self-determination theory (Deci & Ryan, 1985; Ryan & Deci, 2000) as experiences that allow students to satisfy three basic needs (i.e., the need for relatedness, competence, and autonomy). Furthermore, although this study allows for the conclusion that school experiences and happiness influence each other throughout an academic year, the findings do not answer the question of what specific aspects of positive school experiences are more or less important in this process. Future research should extend the findings of this study by examining concrete features of positive school experiences, such as teacher–student relationships (Baker, 1999) and social support at school (Patrick et al., 2007), and by

investigating the significance of other indicators of general psychological functioning, such as performance and resilience (Luthar, Cicchetti, & Becker, 2000).

Second, the sample in this study was not representative of the student population. It included more females than males, predominantly between the ages of 16 and 18, with the majority attending vocational schools. Due to important cognitive changes during adolescence (cf. Bandura, 1997), these results should not be readily generalized to younger students. Future studies should address this line of research in a larger context and also include younger age groups. As not all students in the sample participated at all five measurement occasions, one might be concerned that the results were confounded by systematic attrition. However, frequency of participation was not significantly related to any of the demographic characteristics or to the initial levels of positive school experiences and happiness, which increases the reliability of the results presented here.

Third, due to the self-report nature of the administered measures, their validity might be somewhat compromised, for example, by socially desirable responding or common method bias. However, this limitation should not be a major concern. On the one hand, all questionnaires were administered online, which usually results in fewer socially desirable responses (e.g., Crutzen & Göritz, 2010; Wu & Newfield, 2007); on the other hand, common method bias has been shown to be rather low in most situations (cf. Spector, 2006). However, additional observer reports, implicit measures, or physiological indicators would have provided a more complete and objective understanding and might be worth including in future studies.

Conclusions and Implications

The present study extends cross-sectional evidence that positive school experiences are correlated with general psychological functioning by permitting conclusions on longitudinal effects: Positive school experiences and happiness are reciprocally related and,

over time, lead to an upward spiral in students' lives. This finding is important as it shows the usefulness of the broaden-and-build model of positive emotions (Fredrickson, 2001) for analyzing processes of resource development and general psychological functioning in the context of school. For practitioners, the results highlight once again that creating positive school environments (e.g., environments that satisfy students' needs for autonomy, competence, and relatedness) plays an essential role in students' overall happiness throughout the academic year. In the long term, students will particularly benefit from positive school experiences if they are able to experience frequent positive emotions. More importantly, the upward spiral of positive school experiences and happiness seems to manifest itself very quickly—in the present study as quickly as within one academic year—which suggests that prevention or intervention programs in schools may exert their beneficial effects within a rather short period of time.

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Table 1.

Socio-demographic characteristics and tests for sample attrition

		Descriptive statistics	Tests of sample attrition	
		Final sample ($n = 215$)	Excluded ($n = 114$) vs. final sample ($n = 215$)	Frequency of participation (2/3/4/5 times)
Gender	Male	51 (23.7%)	$\chi^2(1)= 1.88$, $p = .188$	$\chi^2(3) = 6.86, p = .077$
	Female	164 (76.3%)		
Age		$M = 16.51$ ($SD = 1.83$)	$t(327) = -0.63$, $p = .529$	$F(3, 211) = 1.42, p = .239$
Type of School	Secondary modern school	20 (19.3%)	$\chi^2(3) = 5.35$, $p = .148$	$\chi^2(9) = 9.70, p = .375$
	Vocational school	21 (9.3%)		
	Grammar school	26 (12.1%)		
	Vocational school with higher education entrance qualification	148 (68.8%)		
Cohabitation	With both parents	153 (71.2%)	$\chi^2(1) = 1.03$, $p = .334$	$\chi^2(3) = 1.47, p = .689$
	Not with both parents	52 (24.2%)		
Siblings		$M = 1.52$ ($SD = 1.12$)	$t(299) = 0.73$, $p = .467$	$F(3, 200) = 1.18, p = .319$
Educational attainment: mother	Compulsory school	40 (18.6%)	$\chi^2(3) = 5.32$, $p = .150$	$\chi^2(3) = 5.79, p = .122$
	Junior high school diploma or apprenticeship certificate	85 (39.5%)		
	High school diploma	38 (17.7%)		
	University degree	22 (10.2%)		
Educational attainment:	Compulsory school	37 (17.2%)		
	Junior high school diploma or			

father	apprenticeship certificate	78 (36.3%)	$\chi^2(3) = 2.93$, $p = .403$	$\chi^2(3) = 1.49$, $p = .684$
	High school diploma	40 (18.6%)		
	University degree	28 (13.0%)		
Employment status: mother	Full-time	71 (33.0%)	$\chi^2(2) = 2.60$, $p = .272$	$\chi^2(3) = 2.27$, $p = .518$
	Part-time	81 (37.7%)		
	Non-working	41 (19.1%)		
Employment status: father	Full-time	163 (75.8%)	$\chi^2(2) = 2.42$, $p = .299$	$\chi^2(3) = 4.29$, $p = .231$
	Part-time	6 (2.8%)		
	Non-working	22 (10.2%)		

Table 2.

Means, standard deviations, and inter-correlations for positive school experiences and happiness over time

Variables	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12
1. Gender [a]	-	-												
2. Age	16.51	1.87	-.04											
3. School experiences T1	2.94	0.51	.00	.01	(.84)									
4. School experiences T2	2.90	0.47	-.03	-.08	.78***	(.82)								
5. School experiences T3	3.01	0.49	-.10	-.05	.82***	.83***	(.84)							
6. School experiences T4	2.97	0.48	.01	.04	.84***	.76***	.85***	(.82)						
7. School experiences T5	3.05	0.48	.04	-.03	.80***	.72***	.81***	.86***	(.82)					
8. Happiness T1	2.33	0.94	-.09	-.08	.53***	.36***	.51***	.52***	.32**	(.80)				
9. Happiness T2	2.43	0.94	-.05	-.08	.42***	.39***	.44***	.46***	.24*	.62***	(.82)			
10. Happiness T3	2.62	1.04	-.18*	-.11	.33***	.41***	.49***	.45***	.32**	.53***	.53***	(.87)		
11. Happiness T4	2.54	1.02	.01	-.21**	.35***	.32***	.48***	.49***	.45***	.63***	.66***	.63***	(.86)	
12. Happiness T5	2.92	1.00	-.11	-.16*	.21	.19	.33**	.32***	.32***	.48***	.49***	.59***	.58***	(.86)

Note. N = 127-215. T = Time. Cronbach's α reliabilities are in the diagonal. [a] 0 = male, 1 = female

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

Table 3.

Goodness-of-fit statistics and nested model comparisons

	Model	χ^2	*df*	AIC	CFI	TLI	RMSEA	Models	$\Delta\chi^2$	Δdf	*p*
				Model Fit Statistics				Fits Statistics from Model Comparisons			
M1	Stability model	556.57***	336	874.57	.935	.910	.055				
M2	Reciprocal model	508.98***	328	842.98	.947	.925	.051	M1-M2	47.59	8	< .001
M3	Reciprocal model with time-invariant cross-lagged paths	515.31***	334	837.31	.947	.926	.050	M1-M3	41.27	2	< .001
								M2-M3	6.32	6	.388
M4	Causality model with effects of positive school experiences on happiness	523.39***	335	843.39	.945	.923	.051	M1-M4	33.19	1	< .001
								M3-M4	8.08	1	.004
M5	Reverse causality model with effects of happiness on positive school experiences	545.77***	335	865.77	.938	.914	.054	M1-M5	10.81	1	< .001
								M3-M5	30.46	1	< .001

Note. $N = 215$. *df* = degrees of freedom, AIC = Akaike´s Information Criterion, CFI = Comparative Fit Index, TLI = Tucker Lewis Index,

RMSEA = Root Mean Square Error of Approximation, $\Delta\chi^2$ = Difference in χ^2 for the nested models.
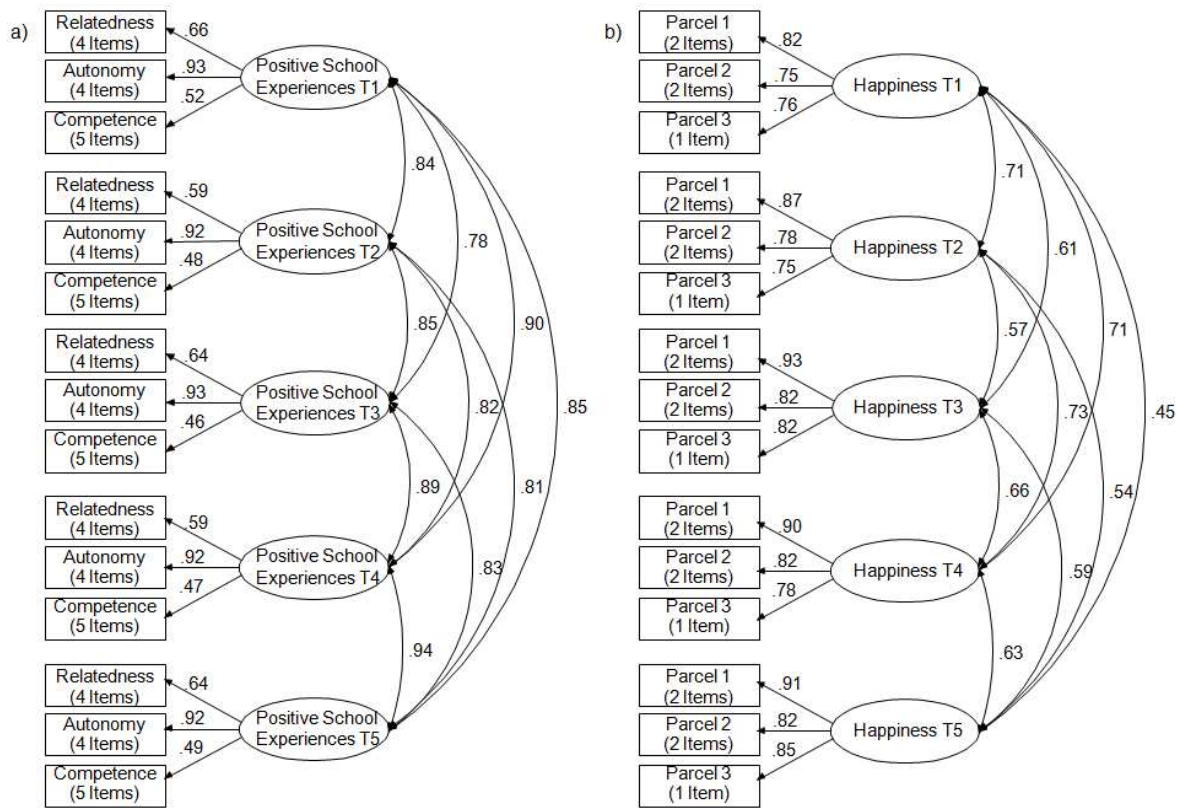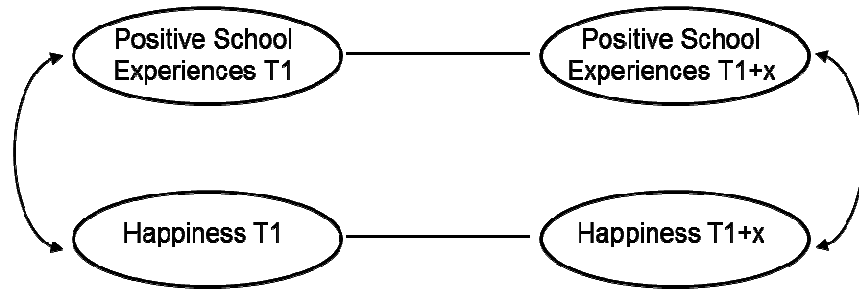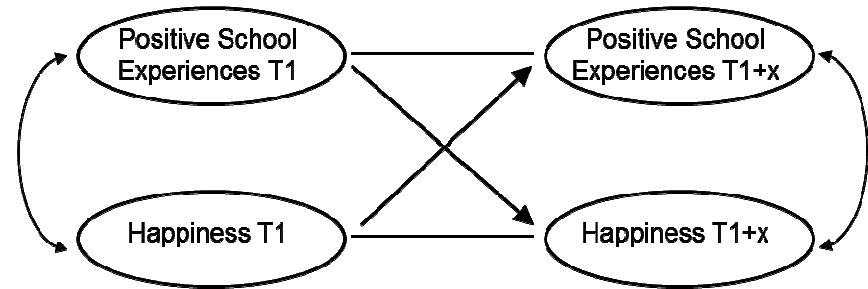
*** $p < .001$

Figure 1. Measurement Models for (a) Positive School Experiences and (b) Happiness

(Standardized Coefficients).

Note. T = Time. Residuals of the indicators and correlations between the residuals of

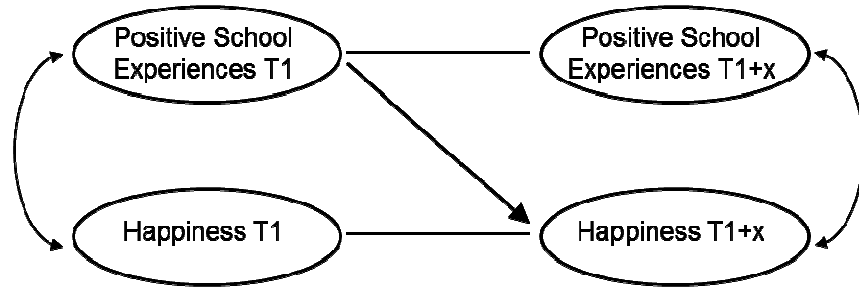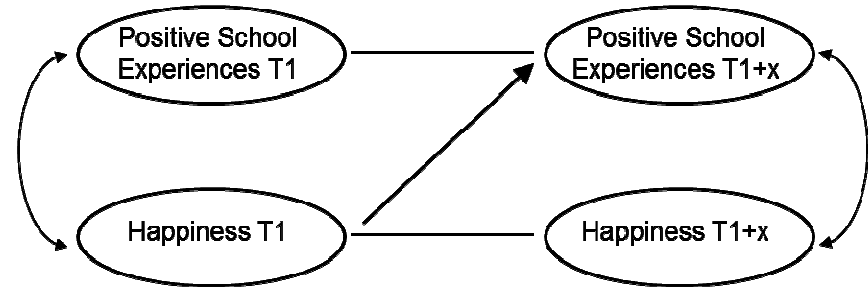corresponding indicators over time are not shown.

Figure 2. Overview of Structural Models.

Note. T = Time. One-headed arrows indicate cross-lagged effects over time ; Double-headed arrows represent synchronous and stability
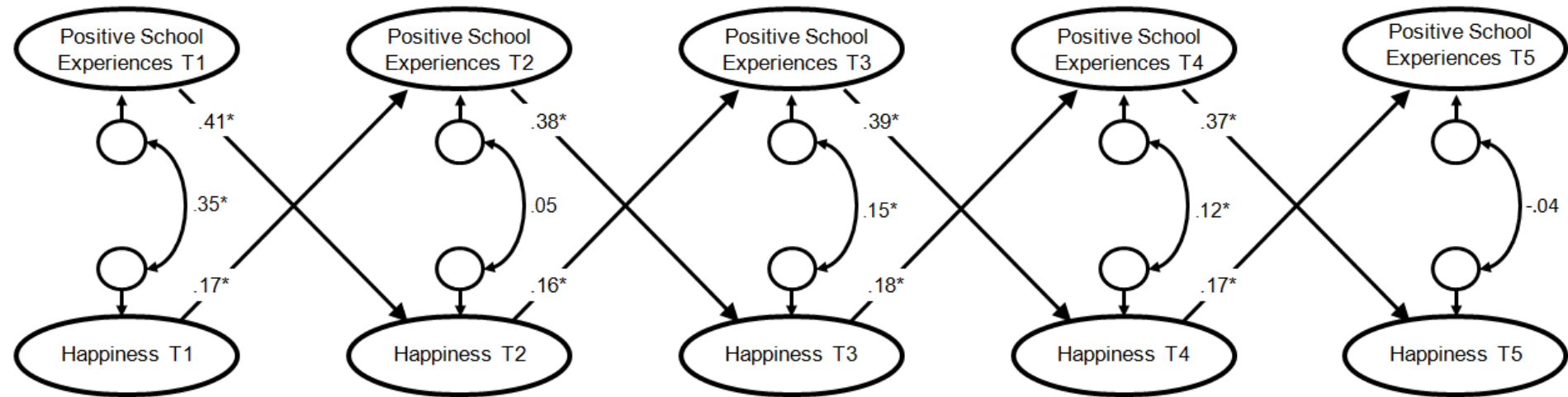
correlations.

Figure 3. Upward-Spiral of Positive School Experiences and Happiness (Standardized Coefficients).

Note. Stability coefficients are not reported here. T = Time. *p < .05.