



How do objective and subjective career success interrelate over time?

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Abstract

The present research is concerned with the direction of influence between objective and subjective career success. We conducted a prospective longitudinal study with 5 waves of measurement that covered a time span of ten years. Participants were professionals working in different occupational fields (N = 1,336). We modelled the changes in objective success (income, hierarchical position), in other-referent subjective success (subjective success as compared to a reference group), and in self-referent subjective success (job satisfaction) by means of latent growth curve analysis. Objective success influenced both the initial level and the growth of other-referent subjective success, but it had no influence on job satisfaction. Most importantly, both measures of subjective success and both their initial levels and their changes had strong influences on the growth of objective success. We conclude that the “objective success influences subjective success” relationship is smaller than might be expected, whereas the “subjective success influences objective success” relationship is larger than might be expected.

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The present research is concerned with the direction of influence between objective and subjective career success. We conducted a prospective longitudinal study with five waves of measurement that covered a time span of 10 years. Participants were professionals working in different occupational fields ($N = 1,336$). We modelled the changes in objective success (income, hierarchical position), in other-referent subjective success (subjective success as compared to a reference group), and in self-referent subjective success (job satisfaction) by means of latent growth curve analysis. Objective success influenced both the initial level and the growth of other-referent subjective success, but it had no influence on job satisfaction. Most importantly, both measures of subjective success and both their initial levels and their changes had strong influences on the growth of objective success. We conclude that the 'objective success influences subjective success' relationship is smaller than might be expected, whereas the 'subjective success influences objective success' relationship is larger than might be expected.

Imagine a highly ambitious young professional who is in a career-track position and earns a high income. Compared to his/her former fellow graduates this person feels highly successful and is satisfied with his/her job. Will this subjective experience of success and satisfaction 'pay' later on and lead to more money or higher status? More generally, how do objective and subjective career success impact each other over time?

Whereas a number of studies are concerned with the association between objective and subjective career success (e.g. Dette, Abele, & Renner, 2004; Judge & Hurst, 2007; Ng, Eby, Sorensen, & Feldman, 2005), there is almost no research on their interrelationship over time. Whereas it is easily conceivable that objective success has an influence on how an individual subjectively experiences his/her career success, it is also conceivable that the subjective experience of success has a direct influence on how this individual's objective success will develop. Experimental research has already shown that optimistic expectations have positive effects on diverse outcome measures

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(Armor & Taylor, 1998; Taylor & Armor, 1996; Taylor & Brown, 1988). Similarly, subjective career success could also instigate objective career success.

The present research analyses the interrelationship between objective and subjective career success in a longitudinal study with five waves of data collection and a time span of overall 10 years starting with the participants' career entry. We tested a large sample of professionals working in different occupations.

Objective and subjective career success over time

Objective and subjective career success

Career success is 'the positive psychological or work-related outcomes or achievements one accumulates as a result of work experiences' (Seibert, Crant, & Kraimer, 1999, p. 417). It is both *objective success* such as pay or hierarchical position and it also comprises the beholder's *subjective success*, which is an individual's evaluation of his/her career (cf. Abele & Wiese, 2008; Arnold & Cohen, 2008; Dette *et al.*, 2004; Dries, Pepermans, & Carlier, 2008; Heslin, 2003, 2005; Judge, Cable, Boudreau, & Bretz, 1995; Ng *et al.*, 2005; Nicholson & De Waal-Andrews, 2005). Recent meta-analyses revealed correlations between objective and subjective success not higher than .30 (Dette *et al.*, 2004; Ng *et al.*, 2005).

Dependent on the comparison standard, i.e. self versus others, subjective success can be conceptualized as *self-referent subjective success* or as *other-referent subjective success* (cf. Abele & Wiese, 2008; Dette *et al.*, 2004; Heslin, 2003, 2005). In self-referent subjective success assessment, an individual compares his/her career relative to personal standards and aspirations. Self-referent subjective career success is usually measured as *career satisfaction* or *job satisfaction* (e.g. Boudreau, Boswell, & Judge, 2001; Bozionelos, 2004; Judge *et al.*, 1995). In other-referent assessment, an individual *compares his/her career relative to an external standard*, for instance a reference group or a reference person. Heslin (2003) found that more than two-thirds of his respondents used other-referent criteria in determining their subjective success.

Objective and subjective career success over time

Several possibilities concerning the directions of influence between objective and subjective career success are conceivable. Objective success could be the basis for the subjective evaluation of success. Many authors state this direction of influence (e.g. Judge *et al.*, 1995; Ng *et al.*, 2005); some even assume that the subjective perception of success is a by-product of objective success (Nicholson & De Waal-Andrews, 2005). Supporting the 'objective influences subjective' reasoning it has been found that income and promotions predict job and career attitudes (Gattiker & Larwood, 1989; Locke, 1976); that income, status, and promotions predict career satisfaction (Judge *et al.*, 1995; Martins, Eddleston, & Veiga, 2002; Richardsen, Mikkelsen, & Burke, 1997; Schneer & Reitman, 1993; Wayne, Liden, Kraimer, & Graf, 1999); and that income predicts changes in career satisfaction in time intervals of 12 months (Raabe, Frese, & Beehr, 2007) and 6 years (Schneer & Reitman, 1997). Turban and Dougherty (1994) found that income and promotions are associated with perceived career success which included other-referent comparison judgments. Similarly, Kirchmeyer (1998) reported positive correlations of income and status with other-referent subjective success. Findings concerning the influence of objective success on job satisfaction are equivocal. Judge *et al.* (1995) and Richardsen *et al.* (1997) found no

influence, whereas Judge, Thoresen, Pucik, and Welbourne (1999) reported positive influences (similarly Cable & DeRue, 2002). It has been suggested that the impact of objective success on job satisfaction may be moderated by age or career stage (Altimus & Tersine, 1973; Lee & Wilbur, 1985).

The reverse direction of influence - that the subjective experience of success leads to more objective success - is also conceivable (Boehm & Lyubomirsky, 2008; Hall, 2002). Subjective success could make a person self-confident, it could enhance his/her motivation and goal-striving, and these motivational effects could lead to more objective success over time. The empirical basis, however, is very limited. We only found one longitudinal study which is somewhat related to this issue. Marks and Fleming (1999) showed that subjective well-being (comprised of an index that among other things included satisfaction with work and money) predicted income with prior income being controlled for.

A third conceivable theoretical perspective is interdependence (Arthur, Khapova, & Wilderom, 2005; Hall, 2002; Hall & Chandler, 2005). People experience objective reality, create understandings and evaluations about what constitutes career success, and then individually act on these understandings and evaluations. Based on their actions they attain certain outcomes, which lead to modified understandings and evaluations, respective behaviours follow, and so forth. Such an interdependence of objective and subjective success can empirically best be demonstrated in a longitudinal analysis with several waves of data collection, i.e. if career *development* is considered. However, we found no such study. The present research was meant to close this gap.

Present research

We argue here that an analysis of the interrelationship between objective and subjective success must consider two more variables. These are on the one hand *time or career phase* and on the other hand the *specific assessment* of subjective success.

Regarding time or career phase, we roughly distinguish between career entry and career growth phases. The career entry phase refers to the process of commencing a profession or becoming involved in a particular organization. The career growth phase concerns the establishment and advancement of one's career (cf. Mount, 1984; Super, 1957). The influence of objective success on subjective success evaluation should be strongest in the career entry phase, in which the individual still has only few criteria for evaluating his/her subjective success (Hall, 2002; Schein, Kolb, Rubin, & McIntyre, 1974; Super, 1957, 1990). Hence, objective attainments are an important basis for assessing one's success in this phase. Conversely, the influence of subjective success on objective success should unfold after a certain time has passed. It takes time for enhanced motivation, persistence, or positive expectations instigated by the subjective feeling of success to unfold their influence. Hence, the influence of subjective success on objective success should be most evident in the career growth phase (Hall, 2002). During this career growth phase objective success may reciprocally instigate subjective success, and so forth.

The specific operationalization and assessment of subjective success should also influence the interrelationship between objective success and subjective success. Objective success should always be a relevant criterion if subjective success is operationalized as other-referent success, because own attainments can be directly compared to those of others (Kirchmeyer, 1998; Turban & Dougherty, 1994). However, objective success need not be a relevant criterion if subjective success is operationalized

as self-referent subjective success. There are many criteria for assessing self-referent success like joy, satisfaction, attainment of self-set goals, etc. and objective outcomes like income or hierarchical status are only two of them. Accordingly, their impact should be limited. This limited weight of objective success for self-referent subjective success may be a reason for the equivocal findings on objective success and job satisfaction (as one operationalization of self-referent subjective success) cited above (see above, Judge *et al.*, 1995, 1999; Richardsen *et al.*, 1997).

Figure 1 depicts our theoretical model and empirical approach. We operationalize objective career success by income and hierarchical status; we operationalize other-referent subjective success by a comparative judgment (how successful are you in your career compared to your former fellow graduates); and we operationalize self-referent subjective success as job satisfaction (cf. Judge *et al.*, 1995, 1999; Richardsen *et al.*, 1997). Job satisfaction is one of the most important aspects of self-referent subjective success, and satisfaction with one's job is one of the most prominent constructs in work and organizational psychology. Research on the interrelationship with objective success over time clearly adds to the vast literature in the field of job satisfaction. Many consequences of job satisfaction have already been investigated (i.e. turnovers, commitment, performance), but findings on long-term effects such as objective career success are still lacking. At Time 1, immediately after our participants' graduation we assessed some control variables (see below). Fourteen months later (career entry phase) we measured objective and subjective success for the first time. Then we measured

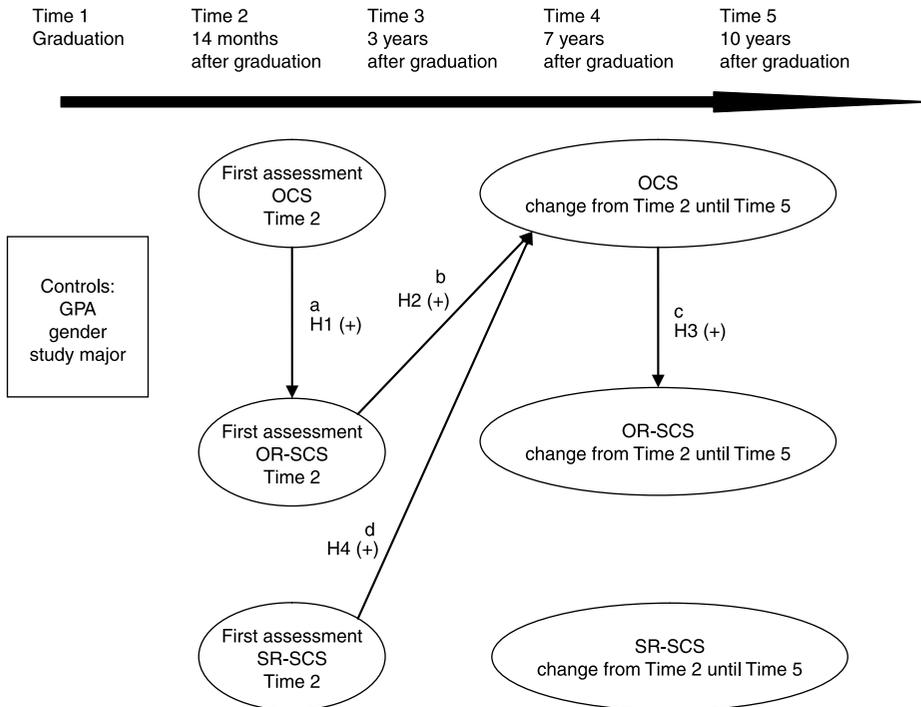


Figure 1. Theoretical model: the interrelationship of objective and subjective career success over time. Note. OCS, objective career success; OR-SCS, other-referent subjective career success; SR-SCS, self-referent subjective career success (job satisfaction).

participants' career success three more times (see Figure 1), and all these subsequent measures from career entry until 10 years later belong to the career growth phase (e.g. Super, 1957). The letters associated with the arrows (paths) in Figure 1 concern our hypotheses.

Hypotheses 1–3 refer to the relationship between objective success and other-referent subjective success.

Hypothesis 1: At career entry, objective career success has a positive influence on other-referent subjective career success (path a).

It may be argued that both measures are taken at the same time, and hence no direction of influence could be tested. However, the hypothesis is theoretically deduced (see above). Furthermore, we argue that the correlation at this time clearly suggests a direction of influence. If people base their subjective success evaluation on objective attainments, then they consider the *actual* state of affairs, and not some prior attainments. More specifically, they do not consider their income (or status) some time ago, but they base their assessment on the present income (or status). Therefore, objective and subjective success must be measured at the same time or at least in a short time interval. Following this reasoning, the initial objective success measured at Time 2 should have *no* influence on changes in other-referent subjective success, because later other-referent success evaluations are based on the objective success given at the time of measurement and not on the objective success some time before.

Hypothesis 2 concerns the influence of subjective success in the career entry phase on objective success in the career growth phase. We assume that the motivational and volitional processes instigated by a positive subjective success evaluation lead to work-related behaviours which after a while enhance objective success (cf. Marks & Fleming, 1999).

Hypothesis 2: Other-referent subjective career success at career entry has a positive influence on changes in objective career success (path b).

Hypothesis 3 concerns the reciprocal influence from changes in objective success on changes in other-referent subjective success. We assume that people who experience growth in objective success will rate their comparative (other-referent) subjective success as higher than people who do not experience growth in objective success.

Hypothesis 3: There is a positive influence of changes in objective career success on changes in other-referent subjective career success (path c).

Regarding the interrelationship of objective success and self-referent subjective success we only state one Hypothesis 4. It concerns the impact of job satisfaction at career entry on changes in objective success over time. Job satisfaction has been shown to influence performance in a positive direction (Riketta, 2008; see also, Judge, Thoresen, Bono, & Patton, 2001; Sheridan & Slocum, 1975; Shore & Martin, 1989; Wanous, 1974), and job performance is associated with higher income or status levels (e.g. Arnold & Cohen, 2008; Ferris, Witt, & Hochwarter, 2001; Judge, Kammeyer-Mueller, & Bretz, 2004). However, as with other-referent success it takes time for these processes to have an influence on objective success.

Hypothesis 4: Job satisfaction at career entry has a positive influence on changes in objective career success (path d).

Further interrelationships between objective success and job satisfaction are tested in an exploratory fashion. Regarding the career entry phase a positive influence of objective success on job satisfaction is conceivable, however, this influence should be small, because objective success is only one among several criteria to evaluate one's job satisfaction. The influence of initial objective success or of changes in objective success over time on changes in job satisfaction should be even smaller, because the number of criteria for assessing one's job satisfaction will increase over time.

We do not state hypotheses on the relationship between the initial level of objective success and its change over time. A positive relationship (the higher the initial level, the more increase), a negative relationship (a higher initial level leads to less increase than a lower initial level), or no relationship is conceivable. In case of subjective success (both other-referent and self-referent), we do not state hypotheses either; however, the relationships are probably negative due to ceiling effects (in case of high initial levels) or floor effects (in case of low initial levels) on the respective scales.

Summarizing, our model suggests that the direction of influence between objective success and subjective success is such that in the career entry phase objective success has an influence on subjective success (more so with regard to other-referent success than with regard to self-referent success); that subjective success (both measures) in the career entry phase has a positive influence on later changes in objective success; and that these changes in objective success positively influence changes in other-referent subjective success, but not changes in job satisfaction.

Because the relationships between two variables can be influenced by third variables which have the potential to influence the two other variables, we also assessed some control variables. These were study major, gender, and grade point average (GPA) at the final exam. Study major has an influence on the field of occupation an individual will start his/her career in. Field of occupation, in turn, is a contextual factor that influences income ranges and/or promotion ranges, and ranges in hierarchical status. If the interrelationship between objective and subjective success as postulated here holds true when study major is controlled for, this is a good indication for the validity of the findings. Gender has been shown to influence income and promotions (Abele & Spurk, 2009; Kirchmeyer, 1998). Thus, we will analyse whether gender influences the associations between objective and subjective career success measures postulated above. Based on previous research, we assume that gender has a main effect on objective success, but that the interrelationship between objective and subjective success remains as hypothesized if gender is controlled for. GPA may have an influence on an individual's career success and it will therefore also be controlled.

We will test our hypotheses by means of latent growth curve modelling. The emergence of new analytic methods has provided useful tools for examining patterns of change over time. Longitudinal studies of the relations among different variables have often relied on regression or path models that examined changes from one wave of data to the next (e.g. Frese, Garst, & Fay, 2007). Latent growth curve analysis represents an alternative strategy for studying change. This methodological approach has the advantage of integrating both individual growth modelling and structural equation modelling (Duncan, Duncan, & Strycker, 2006; Singer & Willet, 2003). Unlike longitudinal path models in which variables at one time point are used to predict variables at a subsequent time point (Farrell, Sullivan, Esposito, Meyer, & Valois, 2005), latent growth curve analysis attempts to model systematic changes in variables as a function of growth curve parameters (see below).

Method

Overview

We tested our hypotheses with data collected in a prospective longitudinal study with a large sample of professionals who had graduated from a German University (see also Abele, 2003; Abele & Spurk, 2009; Abele & Wiese, 2008). Participants completed the first questionnaire shortly after they had passed their final exams. They received the second questionnaire about 1 year later, the third one 3 years after graduation, the fourth one 7 years after graduation, and the fifth one 10 years after graduation. Data from all five waves of measurement are reported here for the first time.

Participants and procedure

Due to address protection reasons, we were not allowed to send out the first questionnaire ourselves. Instead, the university's graduation office sent (or gave) it to the graduates. We asked our participants to complete and return the questionnaire together with their addresses, because the study would be continued some time later. From the 4,200 questionnaires given out 1,930 (46%) were sent back to the researchers.

Time 1

Participants were 825 women and 1,105 men (mean age 27 years). Most of them (95%) were German and the other 5% came from other European countries. Ninety-four per cent of the respondents provided their address ($N = 1,819$). Among other variables, we collected data on gender, study major, and on GPA at this time.

Time 2

Of the 1,819 participants, 102 who had provided their address in the first questionnaire had moved to an unknown address at Time 2. Of the remaining 1,717 participants, 1,397 (588 women and 809 men; mean age 28.5 years) responded to the second questionnaire (response rate 81.4%).

Time 3

Of the 1,663 participants who could be contacted 3 years after graduation (54 individuals had moved to an unknown address), 1,330 (561 women, 769 men; mean age 30 years) responded to the third questionnaire (response rate 80%).

Time 4

Seven years after graduation 1,415 participants were contacted (116 individuals had moved to an unknown address, 132 had declined participation already at Time 3). Out of these, 1,265 participants (527 women, 738 men; mean age 34 years) completed the questionnaire (response rate 89%).

Time 5

Of the 1,415 participants, 41 contacted 10 years after graduation had moved to an unknown address. Of the remaining 1,374 individuals, 1,225 (510 women, 715 men; mean age 37 years) responded to the fifth questionnaire (response rate 89%).

Present sample

The following analyses were performed with 1,336 participants (453 women, 883 men) who completed the first questionnaire and at least one of the later ones. In all waves, 1,014 respondents had participated.¹ We had to exclude participants who had interrupted their professional careers within the 10 years time period for reasons of parental leave (192 women, 6 men). These participants could not provide career success data for their parental leave time(s), and we also could not estimate these missings, because they were not random. Hence, the presumption underlying our analyses that missings are random could not be held for these participants.

The present sample comprised professionals with degrees in law (34 women, 49 men), medicine (78 women, 134 men), arts and humanities (74 women, 45 men), natural sciences (50 women, 131 men), economics (76 women, 167 men), engineering (14 women, 258 men), and teaching (127 women, 99 men). A drop-out analysis comparing the present sample with the initial sample of $N = 1,930$ participants revealed the same distribution of gender and study major. There were also no differences with respect to GPA.

Measures*Objective career success*

We measured objective career success by monthly income before taxes (in 13 steps from 'no income', coded as 0; 'less than €500', coded as 0.5; 'less than €1,000', coded as 1; and then in equal steps to 'less than €10,000', coded as 10; and 'more than €10,000', coded as 11) and by three variables assessing hierarchical status (permission to delegate work, 0 = *no*, 1 = *yes*; temporary project responsibility, 0 = *no*, 1 = *yes*; official leadership position 0 = *no*, 1 = *yes*). Many studies use income as the only measure of objective success. However, in some occupational fields income is a less valid indicator of career success (for instance state employment in which people get income increases by specific age groups) than in others (for instance self-employment, private business). Furthermore, status (permission to delegate, project responsibility, official leadership position) is a less valid indicator if a person is self-employed than if a person is employed by a company. Therefore, we constructed an index of objective career success that is comprised of both income and status. This index varies between 0 and 14. Even if income still has a higher weight in this index than status it was meant to serve as a more complex conceptualization of objective career success, which is also valid in fields in which income and/or status alone are not sufficient to define objective career success. We denote this index 'objective success index'. Objective career success was assessed throughout Times 2-5.

Other-referent subjective career success

We operationalized other-referent subjective career success as a comparison with former fellow graduates ("Compared with your former fellow graduates, how successful

¹ We treated missing values with a full information maximum-likelihood (FIML) approach (cf. Bollen & Curran, 2006; Little & Rubin, 2002; Singer & Willett, 2003) such that all information available from the participants could be used in the analyses. It has been shown that such an approach is less sample biased compared to other missing procedures, i.e. listwise deletion (Bollen & Curran, 2006). We tested the models also without FIML estimation, including only persons with complete data sets. The results were by and large the same as the ones reported here.

do you think your career development has been so far?”), because pre-tests had shown that former fellow graduates are highly important comparison targets. Participants based their responses on a five-point rating scale (1 = *less successful* to 5 = *more successful*). We assessed other-referent subjective career success throughout Times 2–5.

Self-referent subjective career success

We measured self-referent subjective career success in terms of overall job satisfaction (“All in all, how satisfied are you with your job at the moment?”). Participants based their responses on a five-point rating scale (1 = *not at all* to 5 = *absolutely*). We assessed job satisfaction throughout Times 2–5.

Grade point average

We standardized our participants’ individual GPAs in relation to the average of all individuals who had passed their degree in the respective major and year. A value of ‘0’ means that the participant had the same GPA as the average of all graduates of the respective major and respective year; a positive value means that the participant had a GPA higher than average (negative value means lower than average).

Data analysis

We analysed our data with a latent growth curve modelling approach. Latent growth curve models are the most flexible models to study inter-individual differences in intra-individual change (cf. Duncan *et al.*, 2006; Singer & Willet, 2003). Because measurement errors are taken into account, unbiased true change trajectories can be estimated for every participant. Several fit indices are available (Kline, 2005) that allow the comparison of competing models in relation to their fit to the data.

We performed a two step modelling approach. We first modelled the individual growth curves for each of the three success measures across the waves of data collection. We modelled the observed variables (four values each for objective success, for other-referent subjective success, and for job satisfaction) as a function of an *Intercept* factor representing the initial value, a *Linear slope* factor representing change, (if necessary) a *Quadratic slope* factor also representing change, and a measurement error.

Factor loadings linking the intercept factor to the observed variables were set to 1.0 and loadings linking the linear and quadratic factor to the observed variables represent time (number of months) between the first assessment of the success measures and each subsequent wave of data collection. Time 2 was 14 months after graduation, Time 3 was 36 months after graduation, Time 4 was 85 months after graduation, and Time 5 was 117 months after graduation (see Figure 1). We standardized this time variable such that Time 2 was set 0.0 and Time 3 was set 1.0. The difference between Times 2 and 4 then amounted to 3.2, and the difference between Times 2 and 5 amounted to 4.7. The factor loadings for the linear slope, hence, were 0.0, 1.0, 3.2, and 4.7; those for the quadratic slope were 0.0, 1.0, 10.24, and 22.09.

We compared linear and quadratic models for each success measure. A quadratic slope captures the growth above and beyond the linear slope. A negative quadratic slope indicates a deceleration of growth over time, whereas a positive quadratic slope indicates an acceleration of growth over time. Due to the fact that the factor loadings at Times 2 and 3 were the same for the linear and the quadratic slope, but they were much

higher for the quadratic slope than for the linear slope at Times 4 and 5 (see above), the quadratic slope especially captures the Times 4 and 5 measures.

We compared different models either by means of the χ^2 -difference test adjusted by a procedure recommended by Satorra and Bentler (2001) or we applied the Bayesian information criterion (BIC; see also: Raftery, 1993). The BIC tends to favour simpler, more parsimonious models, with lower values reflecting a closer fit. The individual parameter estimates provide the basis for examining the mean and variance of these coefficients within a group and for determining factors that are associated with individual differences (Farrell *et al.*, 2005). We also tested for homoscedasticity and partial homoscedasticity of error variances in the three growth curves (cf. Byrne & Crombie, 2003; Shevlin & Millar, 2006). If (partial) homoscedasticity is found, then the model is more parsimonious than in case of heteroscedasticity. More parsimonious models should be preferred.

In the second step, these growth curves were incorporated into two combined conditional associative models including our time-invariant controls (study major and gender, both dummy-coded; GPA as a continuous variable).² One model concerned objective career success and other-referent subjective career success. The other model concerned objective career success and job satisfaction. The associations between objective and subjective success were estimated by means of regression paths between the latent growth parameter estimates. Data were analysed using version 3 of Mplus (Muthén & Muthén, 1998).

Results

Inter-correlations across all career success measures

For better understanding we display all means, standard deviations, and inter-correlations between the career success measures analysed here (Table 1). All values were estimated by a FIML approach using Mplus.

Modelling growth curves for the three success measures

Objective career success

The modelling of the growth curve for objective success resulted in a curvilinear growth with a deceleration over time ($\chi^2 = 3.09$, $df = 1$, $p = .07$, CFI = 1.00, TLI = 1.00, RMSEA = .04). This model had a better fit than a linear model ($\Delta\chi^2(4) = 219.22$, $p < .001$). A test of homoscedasticity of the error variances was negative, indicating heteroscedasticity ($\Delta\text{BIC} = 103$). The model accounts for 60–99% of the variance in the observed objective success variables at the four times of measurement.

All growth parameter estimates were significant (see Table 2, first row). The mean level significantly increased over time (estimated mean level at career entry was 2.64, estimated mean level about 9 years later was 6.91) and participants differed considerably in their objective success growth curves (see highly significant variances, Table 2, first row). Figure 2a illustrates these findings. On the group level (solid line), there is a linear increase in objective career success until about Time 4, and then this

² These models were conditional, because all latent growth parameter estimates were regressed on the time-invariant controls (study major, gender, and GPA) in order to estimate unbiased associations between objective and subjective career success measures.

Table 1. Inter-correlations across all career success measures ($N = 1,336$)

	<i>M</i>	<i>SD</i>	2	3	4	5	6	7	8	9	10	11	12
1 SR – subjective success t_2^a	3.73	0.02	.29	.19	.19	.30	.19	.12	.13	.13	.05	.11	.12
2 SR – subjective success t_3^a	3.79	0.03		.22	.24	.16	.37	.17	.20	.07	.16	.12	.11
3 SR – subjective success t_4^a	3.81	0.02			.34	.17	.22	.32	.26	.05	.05	.16	.14
4 SR – subjective success t_5^a	3.69	0.02				.16	.19	.22	.29	.01	.03	.10	.16
5 OR – subjective success t_2^a	3.36	0.02					.42	.32	.31	.31	.23	.27	.27
6 OR – subjective success t_3^a	3.39	0.03						.41	.43	.18	.31	.25	.25
7 OR – subjective success t_4^a	3.44	0.02							.56	.09	.20	.38	.33
8 OR – subjective success t_5^a	3.34	0.02								.07	.16	.33	.40
9 Objective success t_2^b	2.62	0.04									.60	.44	.41
10 Objective success t_3^b	4.14	0.05										.54	.50
11 Objective success t_4^b	6.21	0.08											.75
12 Objective success t_5^b	6.91	0.09											

Note. $r > .06, p < .05$; $r > .09, p < .01$; $r > .11, p < .001$; SR, self-referent; OR, other-referent; values are estimated by a full information maximum likelihood approach.

^aScale from 1 to 5.

^bScale from 0 to 14.

Table 2. Means and variances for growth parameter estimates of objective success, other-referent subjective success, and self-referent subjective success ($N = 1,336$)

Success	Intercept (initial Level)		Linear slope (growth)		Quadratic slope (growth)	
	Mean	Variance	Mean	Variance	Mean	Variance
OCS	2.64***	1.70***	1.62***	.56**	-0.15***	.02**
OR-SCS	3.42***	.28***	-0.01	.01***		
SR-SCS	3.80***	.19***	-0.01*	.01***		

Note. * $p < .05$; ** $p < .01$; *** $p < .001$; OCS, objective career success; OR-SCS, other-referent subjective career success; SR-SCS, self-referent subjective career success.

increase becomes slower (deceleration). The dotted lines represent exemplary individual trajectories. Participants 'Z' and 'Y' have different levels of initial objective success, but both have a sharp linear increase over time, participant 'X', in contrast, shows more or less no change. A significant negative correlation between the linear and the quadratic slope ($r = -.69, p < .05$) indicates that participants with steeper initial growth tended to show more deceleration in growth over time. Summarizing, objective success was best represented by a linear increase that decelerated over time and also by significant variability between participants.

Other-referent subjective career success

The model best fitting the data was a linear model with partial homoscedasticity of the error variances ($\chi^2 = 24.93, df = 6, p = .001, CFI = .97, TLI = .97, RMSEA = .05$). This model was more parsimonious and resulted in a better fit than the linear model assuming heteroscedasticity ($\Delta BIC = 6$). The model accounts for 39–68% of the

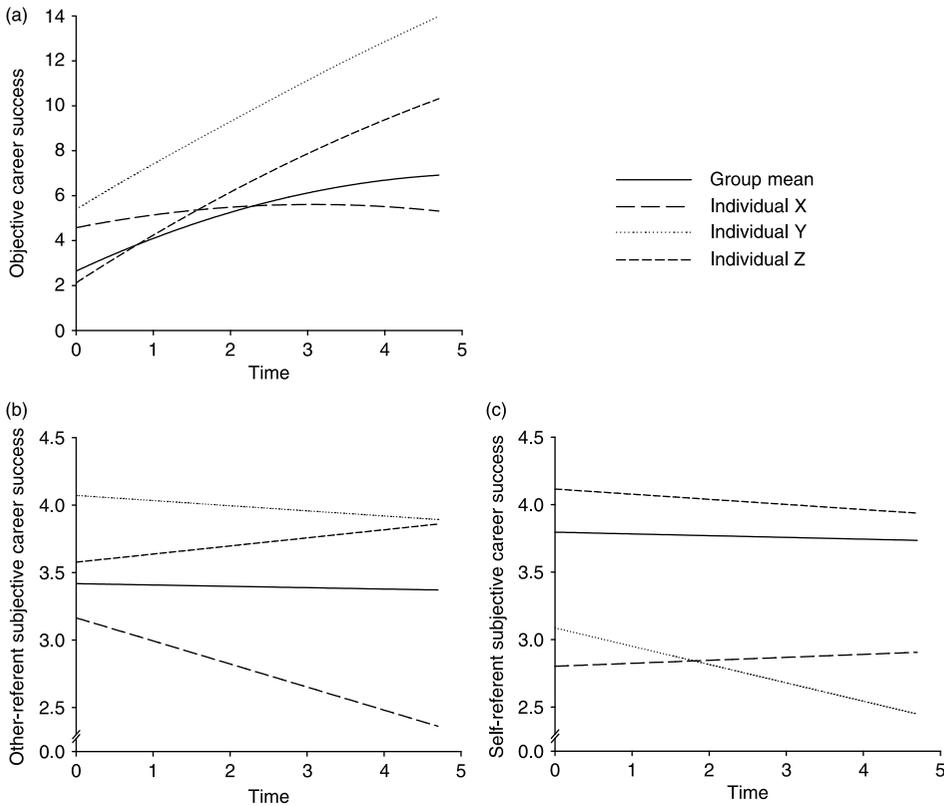


Figure 2. Growth trajectories on the mean level and three exemplary individual trajectories. Note. X, Y, and Z are randomly selected participants for every success measure in the data set.

variance in the observed other-referent subjective success variables at the four times of measurement. Figure 2b depicts the group mean and three exemplary individual trajectories.

As can be seen in Figure 2b, the mean level (solid line) of other-referent subjective success did not change over time (linear slope: $M = -0.01$, ns; see Table 2, second row). The estimated group mean at career entry ($M = 3.42$) was about the same as at Time 5 ($M = 3.36$). However, there was significant variability in the individual growth trajectories (see significant variances in intercept and linear growth; Table 2, second row). One exemplary participant decreased sharply in other-referent subjective success (participant 'X'), one decreased slightly (participant 'Y'), and one increased slightly (participant 'Z'). A negative correlation ($r = -.24$, $p < .05$) between the intercept and the linear slope indicates that participants with higher initial values showed less increase over time compared to participants with lower initial values. Summarizing, other-referent subjective success was best represented by a stable mean level and significant variability between participants.

Self-referent subjective career success

The model best fitting the data was a linear model with partial homoscedasticity of the error variances ($\Delta\text{BIC} = 14$; final model: $\chi^2 = 24.32$, $df = 6$, $p < .01$, CFI = .92,

TLI = .93, RMSEA = .04). The model accounts for 24–39% of the variance in the observed self-referent subjective success variables at the four times of measurement. Figure 2c depicts the group mean and three exemplary individual trajectories.

We found a slight decrease on the mean level over time (linear slope: $M = -0.01$, $p < .05$). The estimated job satisfaction decreased from 3.80 at career entry to 3.74 at Time 5. We again found significant inter-individual differences in the growth trajectories (see variances in intercept and linear growth, Table 2, third row) with sharp decreases (exemplary participant ‘Y’ in Figure 2c), slight decreases (exemplary participant ‘Z’ in Figure 2c), or slight increases (exemplary participant ‘X’ in Figure 2c). A significant negative correlation ($r = -.44$, $p < .05$) between the intercept and the linear slope indicates that participants with higher initial values showed a steeper decrease than participants with lower initial values. Summarizing, self-referent subjective success was best represented by a minor linear decrease on the mean level and again significant variability across participants.

Hypotheses testing

Objective career success and other-referent subjective career success

Figure 3 (upper panel) shows the findings for the conditional associative model on objective career success and other-referent subjective success. It has a good model fit ($\chi^2 = 119.07$, $df = 40$, $p < .001$, CFI = .98, TLI = .95, RMSEA = .04). Supporting Hypothesis 1, there was a positive influence of initial objective success (intercept) on initial other-referent subjective success (intercept; $\beta = 0.42$, $p < .001$). Objectively more successful participants rated their career success as higher compared to their former fellow graduates than objectively less successful participants. Supporting Hypothesis 2, there was a positive influence of initial other-referent subjective success on the growth in objective success (linear slope; $\beta = 0.42$, $p < .001$). Individuals who perceived themselves as more successful than their former fellow graduates became objectively more successful over time. In addition, participants with a steeper increase in other-referent subjective success (linear slope) showed less deceleration in objective success increase over time (quadratic slope; $\beta = 0.25$, $p < .001$).³ This positive relationship gives further support for Hypothesis 2. Supporting Hypothesis 3, the growth in objective success (linear slope) positively influenced the growth in other-referent subjective success (linear slope; $\beta = 0.41$, $p < .001$). A positive change in objective success led to a positive change in other-referent subjective success.

Initial objective success had no effect on changes in other-referent subjective success (linear slope; $\beta = -0.16$, ns). This finding supports our above reasoning that objective success and other-referent subjective success have to be assessed at the same time, if the influence of objective to subjective success should be demonstrated. Previous objective success is not a basis for later subjective success evaluation.

All these findings were revealed after controlling for GPA, gender, and study major. The beta effects of the control variables can be seen in Table 3 (columns 1 to 5). We found a strong impact of study major on the initial value and on the growth of

³ The literature on growth curve modelling does not cover the present case, in which the linear slope of one variable (here subjective success; SCS) is related to the quadratic slope of another variable (here objective success; OCS). We contacted an expert (Bengt Muthén) on this issue. He supported our reasoning to regress the quadratic slope of OCS on the linear slope of SCS as well as to interpret the quadratic slope as a representation of later changes in OCS (because of the higher factor loadings at Times 4 and 5). In any case, our hypotheses are supported without considering this path as well.

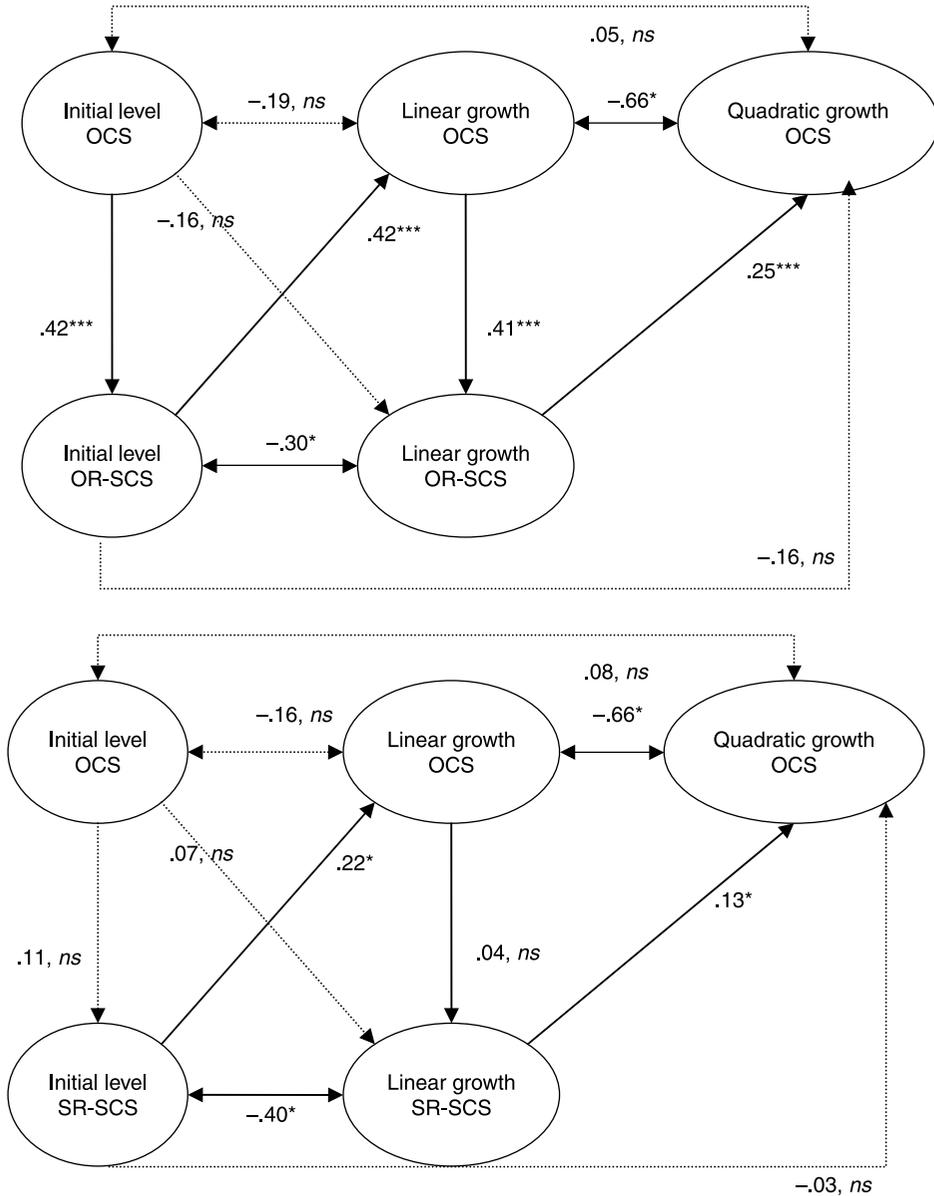


Figure 3. Conditional associative models for objective and subjective career success over time; upper panel: objective success and other-referent subjective success; lower panel: objective success and self-referent subjective success (job satisfaction). Note. OCS, objective career success; SR-SCS, self-referent subjective career success; all latent growth variables are regressed on study major, gender, and GPA; residual variances of the manifest variables at one time were allowed to correlate between the two success measures.

objective success. This reflects contextual influences such that income, income development, and promotions are different in different occupational contexts. We also found that women both started with lower career success than men, and that their increase in career success was also lower than men's. However, the deceleration

Table 3. Beta effects of study major, gender, and GPA on the latent growth parameter in the conditional models ($N = 1,336$)

	Objective success			Other-referent Subjective success		Self-referent Subjective success	
	Intercept	Linear slope	Quadratic slope	Intercept	Linear slope	Intercept	Linear slope
Study major							
Law	–	.27***	–.13*	–	–	–.17*	–
Medicine	.47***	.13*	–	–.13*	–	–	–.19*
Arts and humanities	.27***	–.15*	.16*	–.11*	–	–	–
Science	.27***	–.14*	.25**	–	–	–.13*	–
Economics	.76***	–	.23**	–	–	–	–
Engineering	.62***	–	.21*	–	–.23*	–	–.20*
Gender ^a	.05*	.18**	–	.21***	–	–	–
GPA	.05*	–	–	–	–	–	–

Note. * $p < .05$; ** $p < .01$; *** $p < .001$; GPA, Grade Point Average; study major dummy coded (teaching is reference category).

^a 0, female; 1, male.

(quadratic slope) did not differ between men and women. Regarding other-referent subjective success, men had higher initial values, but there was no gender influence on changes in other-referent subjective success. GPA only had a positive influence on the initial objective success. The variance explained by these controls varied widely between the different growth curve parameter estimates (intercept objective success: 46%, linear slope objective success: 28%, quadratic slope objective success: 3%, intercept other-referent subjective success: 19%, linear slope other-referent subjective success: 15%).

Objective career success and self-referent subjective career success

Figure 3 (lower panel) illustrates the findings (model fit: $\chi^2 = 119.82$, $df = 40$, $p < .001$, CFI = .98, TLI = .95, RMSEA = .04). In line with Hypothesis 4, we found a positive influence of initial job satisfaction on the growth of objective success (linear slope; $\beta = 0.22$, $p < .05$). We also found a positive influence of the growth in job satisfaction on the quadratic slope of objective success ($\beta = 0.13$, $p < .05$). This means that job satisfaction and an increase in job satisfaction led to more objective success over time as well as to less deceleration of objective success over time.

The influence of initial objective success on initial job satisfaction was not significant ($\beta = 0.11$, ns). Initial objective success also had no influence on changes in job satisfaction ($\beta = 0.07$, ns), and changes in objective success had no influence on changes in job satisfaction ($\beta = 0.04$, ns) either.

These findings were again revealed after controlling for GPA, gender, and study major. Table 3 (columns 6 and 7) shows the beta effects of the controls. Gender and GPA had no effect and study major had minor effects on job satisfaction. Participants who had graduated in law or science had lower initial levels of job satisfaction, and participants who had graduated in medicine or engineering had a lower increase in job satisfaction than participants with other degrees. The controls explained 7% of the variance in the initial level, and 8% of the variance in the growth of self-referent subjective success.

Discussion

The aim of the present research was a test of the interrelationship of objective career success (income, hierarchical status) and subjective career success (comparison with others, job satisfaction) over time. We suggested a model which takes time (career entry phase, career growth phase) and specific assessment of subjective success (other-referent: comparison with significant others; self-referent: job satisfaction) into account. We tested our hypotheses with data gathered in a five-wave longitudinal study covering a time interval from career entry to 10 years later. Our study comprises a large sample of highly qualified professionals, it covers many fields of employment (teaching, medicine, law, arts and humanities, science, economics, engineering), and besides study major it considers gender and GPA as controls. To our knowledge, this is the first study to empirically investigate the interrelationship in *changes* of objective and subjective career success over a long time period.

Objective and subjective success over time

Objective success was best modelled by curvilinear growth. There was a steady increase of objective success until about 7 years of professional experience. Later on growth slowed down a bit. The initial level of objective success was uncorrelated to its growth, but the steeper the growth was in the initial waves of measurement, the more it slowed down later on. Furthermore, the growth curves of our participants differed significantly.

The modelling of other-referent subjective success resulted in a stable mean level over time, but a negative correlation between entry level and change. This negative correlation had been expected and may partially be due to methodological reasons. Participants' initial level of other-referent success was already relatively high (estimated mean 3.42 on a five-point scale), and there may have been ceiling effects. However, because there was again significant inter-individual variability in the growth curves the findings cannot be accounted for by ceiling effects only. Rather the stable mean level accompanied by significant inter-individual variability shows that about the same number of participants changed their other-referent subjective success evaluations in a favourable direction and in an unfavourable direction.

The modelling of changes in job satisfaction (self-referent success) revealed a slight but significant linear decrease over time. Previous research revealed equivocal findings in the development of job satisfaction (increase: Flaherty & Pappas, 2002; Lynn, Cao, & Horn, 1996; decrease: Morrow & McElroy, 1987; Rode, 2004; no change: Morrow & McElroy, 1987). The modelling also revealed a strong negative correlation between initial level and change, which can be explained in an analogous way as for other-referent career success. Finally, the slightly decreasing mean level accompanied by significant inter-individual variability in job satisfaction over time suggests that although there were more participants with decreases in job satisfaction, there were also participants with increases and participants with no change at all.

The influence of initial objective success on initial subjective success

In accord with Hypothesis 1, initial objective success had a positive influence on initial other-referent success. It had, however, no influence on initial self-referent success (job satisfaction). These findings support and refine theorizing on when (time) and under which conditions (measurement issue) objective success influences

subjective success (cf. Hall, 2002; Hall & Chandler, 2005; Judge *et al.*, 1995; Nicholson & De Waal-Andrews, 2005).

The interrelationship between objective success and subjective success over time

Supporting Hypotheses 2 and 4, we found strong evidence that subjective success (both other-referent and self-referent) influenced the changes in objective success over time. Other-referent subjective success had a large and positive impact on the development of objective success (Figure 3 upper panel), which was much higher than the effect of study major, gender, or GPA (see Table 3). The effect of job satisfaction on objective success was also high (Figure 3 lower panel), especially if compared to other psychological predictors of career success, and especially considering that it is a longitudinal effect (Judge & Hurst, 2007; Ng *et al.*, 2005; Seibert *et al.*, 1999).

This large 'subjective influences objective' effect is the most important finding of the present research. Subjective success is not just a by-product of objective success and it is not only a desirable state for the individual in question. It rather has a strong influence on objective attainments over a long time span. At present, we can only speculate about the reasons for this effect. Subjective success may make a person self-confident and enhance his/her motivation and effort expenditure. Social psychological research has shown that optimistic expectations have positive effects on diverse outcome measures (Armor & Taylor, 1998; Taylor & Brown, 1988). Recent developments in 'positive psychology' also suggest that positive experiences lead to processes which 'broaden' a person's perspective and 'build' his/her resources ('broaden and build theory'; Fredrickson, 1998). Diener, Nickerson, Lucas, and Sandvik (2002), for instance, have shown that positive affect predicts how much a person will earn later on (see also Boehm & Lyubomirsky, 2008; Salmela-Aro & Nurmi, 2007). The analysis of the processes mediating between positive evaluations and favourable objective outcomes will be an important topic in future career research.

Additional findings

The findings on study major can be interpreted as contextual effects. It was not the aim of the present research to deeply analyse these contextual effects; we were rather interested in testing our hypotheses controlling for possible confounds. We draw three conclusions regarding study major. First, the present findings hold true even though the professional tracks of our participants are rather divergent. Second, the effect of study major is strongest at career entry and becomes smaller later on. Third, the impact of study major on objective success is much stronger than its influence on subjective success. The lower objective success of women than men is in line with previous research (Abele, 2003; Kirchmeyer, 1998). It emerged even though all women who took a maternal leave during the 10-year observation period were omitted in the present analyses. The gender effect is much smaller for subjective success than for objective success. Finally, the influence of GPA was very small and only visible with respect to objective success at career entry.

Limitations

One might argue that the objective success measure was self-reported objective success and therefore not 'objective' in a strict sense. Other research, however, has shown that self-reported income is nearly the same as income taken from objective sources

(cf. Judge *et al.*, 1995). One might also argue that we only had one-item measures for the subjective success assessments, and that one-item measures are not as reliable and valid as are multiple operationalizations. However, the present single item other-referent subjective success measure captures the essence of other-referent career success that we are interested in. In Heslin's research (2003), the one-item measure of other-referent success was strongly related to overall career success ($r = .76$), to a self-referent scale ($r = .62$), and to an other-referent scale ($r = .69$). In our present research, we included two more other-referent subjective success assessments at Time 5 (comparison with university graduates generally; comparison with people of the same age). The corrected correlation of the scale and the item we used for the change measure here was .60. Regarding the one-item job satisfaction measure Ironson, Smith, Brannick, Gibson, and Paul (1989) also argued that a single item captures the essence of job satisfaction better than a more specific subscale measure. The validity of a single item job satisfaction measure was confirmed in a meta-analysis by Wanous, Reichers, and Hudy (1997). In our present research, we included a job satisfaction scale with nine items at Time 5. The correlation of this scale with our single-item measure was .72. We conclude that there is reliability and validity for the one-item subjective career success measures applied here.

The present findings concern highly educated professionals working in Germany. Future research will have to address whether the relationships between objective and subjective success reported here can also be shown in other samples. Since we could show that the findings were independent of study major, we are confident that the pattern of results is relatively robust with respect to context effects. We also do not see reasons why the present findings should be specific to the German context.

Research perspectives

Besides continuing the analysis of the interrelationship between objective and subjective success on to later career phases, the present findings suggest further research perspectives. One is the analysis of the processes mediating the strong influence of subjective success on objective success in the career growth phase. Based on the present findings, it seems especially interesting to study the impact of different facets of subjective success. It is possible that other-referent subjective success instigates motivational and volitional processes that have to do with a contest perspective, i.e. the wish to be better than others and to reach highly ambitious career goals. Job satisfaction may instigate motivational and volitional processes directed at mastery and high efficiency in dealing with professional tasks. Another closely related research perspective is an even more differentiated analysis of subjective success than the one performed here. Regarding other-referent success the specific comparison 'other' can be differentiated (colleagues, persons of the same age, friends, etc.; cf. Heslin, 2003, 2005). Regarding self-referent success not only job satisfaction, but also career satisfaction (Greenhaus, Parasuraman, & Wormley, 1990) could be included.

Conclusion

The present research showed that objective career success does influence the subjective evaluation of one's career, but only if the subjective success assessment is based on a comparative judgment. One message of the present study hence says that the influence of objective success on the subjective experience of success should

not be overestimated. The other message is that we must not regard subjective success as a by-product of objective attainments. The influence of subjective success on objective success should not be underestimated. The size of this influence is larger than of many other psychological predictors of career success. Subjective success is desirable for individuals and it seems to be desirable for organizations, too. Subjectively successful professionals become objectively more successful, and this is advantageous for both the individual and the organization.

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