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# The Career Satisfaction Scale: Longitudinal measurement invariance and latent growth analysis

Daniel Spurk*, Andrea E. Abele and Judith Volmer
University of Erlangen-Nuremberg, Germany

The present research analyses the adequacy of the widely used Career Satisfaction Scale (CSS; Greenhaus, Parasuraman, & Wormley, 1990) for measuring change over time. We used data of a sample of 1,273 professionals over a 5-year time period. First, we tested longitudinal measurement invariance of the CSS. Second, we analysed changes in career satisfaction by means of multiple indicator latent growth modelling (MLGM). Results revealed that the CSS can be reliably used in mean change analyses. Altogether, career satisfaction was relatively stable over time; however, we found significant variance in intra-individual growth trajectories and a negative correlation between the initial level of and changes in career satisfaction. Professionals who were initially highly satisfied became less satisfied over time. Theoretical and practical implications with respect to the construct of career satisfaction and its development over time (i.e., alpha, beta, and gamma change) are discussed.

Career satisfaction is an important topic in career research because subjective feelings of success are related to many facets of work behaviour and well-being (e.g., Abele & Spurk, 2009; Ng, Eby, Sorensen, & Feldman, 2005). Our knowledge about how career satisfaction develops over time is still very limited. However, applied psychology and career research (cf. Hall, 2002; Roe, 2008; Van Der Heijden, Schalk, & van Veldhoven, 2008) call for more studies that explicitly address the role of time and focus on the question 'what happens' rather than 'what is' (cf. Roe, 2008). A developmental and applied perspective on career research requires measurement tools that are reliable for assessing mean change over time (cf. Chan, 1998).

Career satisfaction as individuals' idiosyncratic evaluations of their own careers is often seen as one central indicator of subjective career success (Abele, Spurk, & Volmer, 2011; Boudreau, Boswell, & Judge, 2001; Judge, Cable, Boudreau, & Bretz, 1995; Ng *et al.*, 2005). It is the evaluation of an individual's progress towards meeting different career-related goals (e.g., income, achievement, development) and career-related successes (e.g., overall career success; see also Hofmans, Dries, & Pepermans, 2008). The Career Satisfaction Scale (CSS; Greenhaus, Parasuraman, & Wormley, 1990; Hofmans *et al.*, 2008) is a widely accepted measure of career satisfaction.

*Correspondence should be addressed to Daniel Spurk, Social Psychology Group, University of Erlangen-Nuremberg, Bismarckstr. 6, D 91054 Erlangen, Germany (e-mail: daniel.spurk@sozpsy.phil.uni-erlangen.de).

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The present research analyses the adequacy of the CSS for measuring mean change over time. First, we will test its longitudinal measurement invariance. Second, we will analyse intra-individual change trajectories in career satisfaction by means of multiple indicator latent growth modelling (MLGM; Chan, 1998). Theoretical implications with respect to career satisfaction and, more generally, to subjective career success as well as different types of change processes, namely alpha, beta, and gamma change (cf. de Jonge, van der Linden, Schaufeli, Peter, & Siegrist, 2008; Golembiewski, Billingsley, & Yeager, 1975) will be discussed.

*Measurement invariance* can be considered as the degree to which measurements conducted under different conditions show identical psychometric properties (cf. Cheung & Rensvold, 1999). In *longitudinal measurement invariance analyses*, these different conditions refer to the different times of measurement. By placing equality constraints on specific model parameters, three different forms of measurement invariance can be tested. Two of these forms, namely weak and strong measurement invariance, provide a qualitative understanding of the underlying construct (Chan, 1998; Cheung & Rensvold, 1999; Wu, Chen, & Tsai, 2009). Specifically, in case of career satisfaction *weak invariance* would mean that the relative importance of single items measuring career satisfaction does not change over time (Steenkamp & Baumgartner, 1998). *Strong invariance* would mean that the stability of the latent career satisfaction construct over time is not due to response biases (Cheung & Rensvold, 1999). The third form, *strict invariance*, tests whether the reliabilities of the single items are the same over time.

Golembiewski *et al.* (1975) have introduced a taxonomy of change processes (i.e., *alpha*, *beta*, and *gamma change*). Quantitative changes are called *alpha change* defined as 'a variation in the level of some existential state, given a constantly calibrated measuring instrument related to a constant conceptual domain' (cf. Golembiewski *et al.*, 1975, p. 134). In case of alpha change individuals' increase or decrease in career satisfaction can be clearly interpreted as a quantitative 'more' or 'less' of satisfaction over time.

Alpha change, however, can only be meaningfully interpreted as true change in the absence of beta and gamma change. Beta and gamma change provide further information about change processes of the underlying construct (de Jonge *et al.*, 2008). *Beta change* is defined as 'a variation in the level of some existential state, complicated by the fact that some intervals of the measurement continuum associated with a constant conceptual domain have been recalibrated' (cf. Golembiewski *et al.*, 1975, p. 135). Weak and strong invariance demonstrates the absence of beta change (Chan, 1998; de Jonge *et al.*, 2008). Furthermore, equal CSS factor variances over time are an indicator for the absence of beta change (de Jonge *et al.*, 2008; Schaubroeck & Green, 1989). For example, in the case of beta change individuals might readjust the relative importance of different aspects of career satisfaction like, for instance, autonomy becoming more important over time.

*Gamma change* is 'a redefinition or reconceptualization of some domain, a major change in the perspective or frame of reference within which phenomena are perceived and classified, in what is taken to be relevant in some slice of reality' (cf. Golembiewski *et al.*, 1975, p. 135). A test for gamma change would test for equal factor covariances within each time point and for the same factorial structure across different time points (de Jonge *et al.*, 2008; Schaubroeck & Green, 1989). We here propose a one-factorial construct of career satisfaction and we will therefore test for the same (one factorial) structure over time (see also Schaubroeck & Green, 1989), representing an additional test for measurement invariance (Chan, 1998).

A detailed analysis of alpha, beta, and gamma change of the CSS contributes to the conceptualization of subjective career success as a construct that might change in the course of an individual's career (see also Arthur, Khapova, & Wilderom, 2005; Gunz & Mayrhofer, 2011; Hall, 2002). Our analyses of the CSS will shed some light on the question whether career satisfaction is reconceptualized over time (i.e., gamma change), whether there is some individual calibration of the measurement instrument (i.e., beta change), or whether there is a 'true' quantitative change over time (i.e., alpha change; cf. Chan, 1998; de Jonge *et al.*, 2008; Golembiewski *et al.*, 1975).

To date, there is only little longitudinal research on changes in career satisfaction. A study by Raabe, Frese, and Beehr (2007) found no mean level differences in career satisfaction over a time span of 9 months. Another study conducted by Bowling, Beehr, and Lepisto (2006) analysed a 5-year time span and found a retest reliability of $r = .67$ for career satisfaction with a mean level increase over time (Time 1: $M = 3.82$; Time 2: $M = 4.22$). In contrast, Schneer and Reitman (1997) found no significant change in career satisfaction over a 13-year period (Time 1: $M = 3.60$; Time 2: $M = 3.70$). The retest reliability of $r = .46$ was of medium size.

Hence, previous studies have revealed different findings that may be attributed to different samples or different time spans. Also, these studies analysed change on an aggregate level by comparing simple means over two time points. They did not include an adequate analysis of intra-individual change trajectories and their variability. Most importantly, these previous studies did not analyse longitudinal measurement invariance. However, as stated above only in case of longitudinal measurement invariance mean level differences between times of measurement can be interpreted as quantitative changes. In case of non-invariance, the findings mentioned above could also represent qualitative changes in the subjective meaning of what represents career satisfaction over time (cf. Chan, 1998).

## Method

### *Sample*

We used a large sample of German professionals who held university degrees in different fields of study (Law, Medicine, Arts and Humanities, Natural Sciences, Business and Economics, Engineering, and Teaching). The first three questionnaires (at graduation, 1.5 years after graduation, and 3 years after graduation) of this study are not relevant here, because career satisfaction was not assessed at these times.

The fourth questionnaire (Time 1 in the present study; 7 years after graduation) was completed by 1,265 participants (527 women, 738 men; mean age 34 years); 2.5 years later 1,225 participants (510 women, 715 men; mean age 37 years) responded to the fifth questionnaire (Time 2 in this study); another 2.5 years later 1,170 participants (475 women, 695 men; mean age 39 years) responded to the sixth questionnaire (Time 3 in this study). Response rates ranged between 85% and 89%.

Our final sample consists of 1,273 participants (496 women, 777 men; mean age at Time 3: $M = 39.21$, $SD = 2.46$) who had participated at least once at Time 1, Time 2, or Time 3. There are some missing data because of time-specific dropouts by some participants (Time 1: 62 missing values, Time 2: 100 missing values, Time 3: 146 missing values). The average working hours of our participants were: $M = 34.48$, $SD = 12.30$ (Time 1); $M = 34.82$, $SD = 12.15$ (Time 2); and $M = 35.46$, $SD = 12.15$ (Time 3).

### Measure

We measured career satisfaction by means of the CSS (Greenhaus *et al.*, 1990). The items can be seen in Appendix and are used in all of our analyses in this consecutive order. The scale reliabilities were good at all times of measurement (Time 1: Cronbach's $\alpha =$ .84, Time 2: Cronbach's $\alpha =$ .83, Time 3: Cronbach's $\alpha =$ .85).

### Data analysis

#### Longitudinal measurement invariance

Prior to applying any invariance constraints, a baseline model is estimated to see if the factor structure remains the same over time (*configural invariance*, see Byrne, Shavelson, & Muthén, 1989; Vandenberg & Lance, 2000). Consequently, there are three latent factors (one at each time point) that should be correlated. In addition, error terms of the same items are correlated over time to account for specific item effects. Support for this baseline model also signals the absence of gamma change (cf. Schaubroeck & Green, 1989) and further restrictive constraints can be imposed. These constraints test for different, increasingly restrictive assumptions of longitudinal measurement invariance.

First, for *weak invariance*, factor loadings are constrained to be equal over time. A $\chi^2$-difference test is conducted to test if this loading-constrained model is significantly different from the baseline model. A non-significant $\chi^2$-difference test indicates that factor loadings are invariant over time.

Second, based on the weak invariance model, intercepts are constrained to be equal over time resulting in *strong invariance*. A non-significant $\chi^2$-difference test between the baseline and strong invariance models indicates that intercepts are invariant over time. These invariance tests also provide information on the presence versus absence of beta change.

In the next step, we tested *strict invariance*. Based on the strong invariance model error variances of the same indicators are held constant over time. A non-significant $\chi^2$-difference between the baseline and strict invariance models indicates that item uniqueness is invariant over time, satisfying strict invariance. In that case, the reliabilities for all items remain the same over time (Wu *et al.*, 2009).

Finally, we tested for the same CSS factor variances over time. This is a test for beta change. *Full* (invariance for all items) *weak*, and *partial* (invariance for some items) *strong* longitudinal measurement invariance is a sufficient precondition for the analysis of quantitative change over time (Chan, 1998).

#### Multiple indicator latent growth modelling (MLGM)

MLGM is based on *latent variable growth modelling* with the extension that the focal variable of change (i.e., career satisfaction) is modelled as a latent variable represented by multiple indicators. MLGM models inter-individual differences in intra-individual change over time (i.e., individual growth curves) as a function of *growth parameters*, namely the *intercept* factor representing the initial value and the *slope* factor representing the rate of change. Every growth parameter is interpreted on the mean and the variance level. The *mean level* refers to true mean changes over time and the *variance level* refers to the presence or absence of variability between individual growth curves with respect to intercept and slope.

Since we are analysing three times of measurement, only linear growth curves (i.e., *linear slopes*) can be modelled. Quadratic changes would require at least four times of

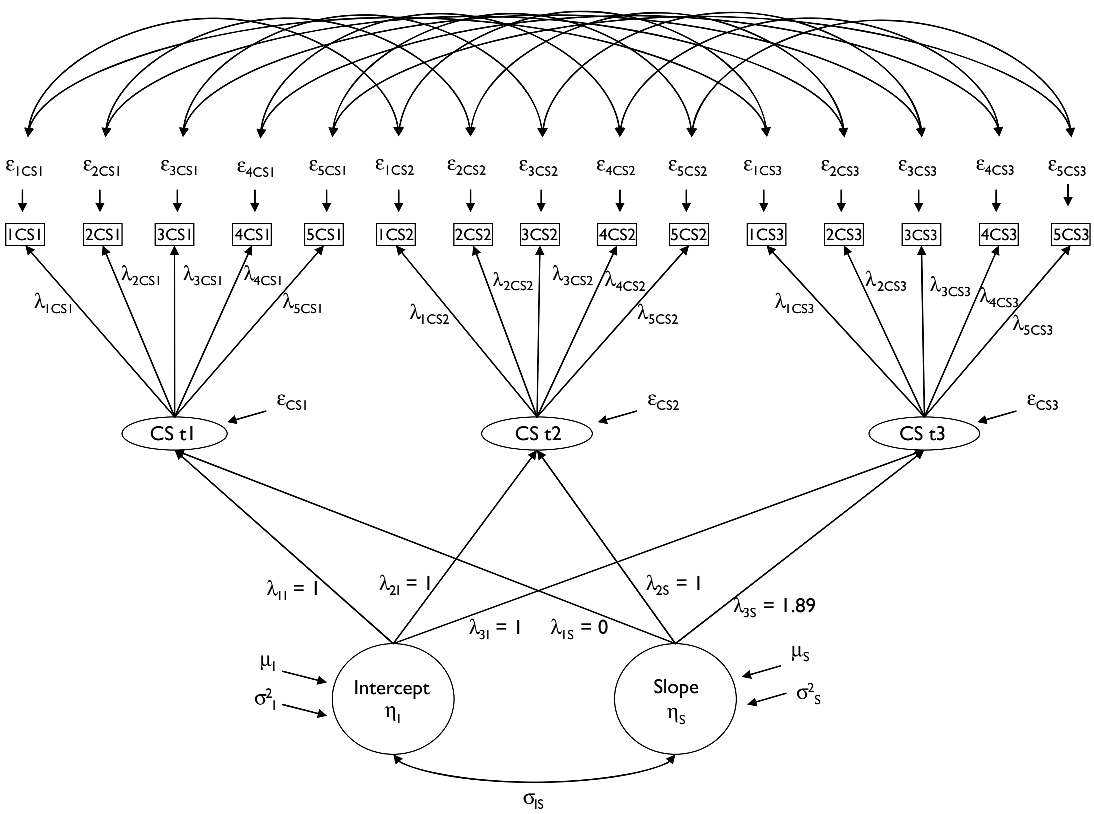


**Figure 1.** Analytical approach: longitudinal measurement invariance and multiple indicator latent growth modelling. *Note.* $N = 1{,}273$; $\sigma$ = correlations; $\sigma^2$ = variances; $\mu$ = means; $\lambda$ = factor loadings; $\varepsilon$ = error variances; 1CS1 … 5CS3 = intercepts of manifest variables; $\eta$ = growth parameters; full weak longitudinal invariance: $\lambda_{1CS1} = \lambda_{1CS2} = \lambda_{1CS3}$, $\lambda_{2CS1} = \lambda_{2CS2} = \lambda_{2CS3}$, $\lambda_{3CS1} = \lambda_{3CS2} = \lambda_{3CS3}$, $\lambda_{4CS1} = \lambda_{4CS2} = \lambda_{4CS3}$, $\lambda_{5CS1} = \lambda_{5CS2} = \lambda_{5CS3}$; full strong longitudinal invariance: 1CS1 = 1CS2 = 1CS3, 2CS1 = 2CS2 = 2CS3, 3CS1 = 3CS2 = 3CS3, 4CS1 = 4CS2 = 4CS3, 5CS1 = 5CS2 = 5CS3; full strict longitudinal invariance: $\varepsilon_{1CS1} = \varepsilon_{1CS2} = \varepsilon_{1CS3}$, $\varepsilon_{2CS1} = \varepsilon_{2CS2} = \varepsilon_{2CS3}$, $\varepsilon_{3CS1} = \varepsilon_{3CS2} = \varepsilon_{3CS3}$, $\varepsilon_{4CS1} = \varepsilon_{4CS2} = \varepsilon_{4CS3}$, $\varepsilon_{5CS1} = \varepsilon_{5CS2} = \varepsilon_{5CS3}$; $\varepsilon_{CS1} = \varepsilon_{CS2} = \varepsilon_{CS3}$; two-headed arrows between error variances represent correlations between error variances of the same indicators over time; factor loadings of the intercept are fixed to 1; factor loadings of the slope are fixed to 0, 1, and 1.89 and represent linear time.

measurement (Bollen & Curran, 2006). Factor loadings linking the slope factor to the latent career satisfaction construct represent the relative time spans between the three measurement points. The full analytical approach including longitudinal measurement invariance is depicted in Figure 1. For readers interested in more specific modelling details, we recommend Bollen and Curran (2006).

### *Treatment of missing data*

Regarding the treatment of missing data we decided to apply a *full information maximum likelihood* (FIML) *procedure*, because this procedure is based on the less restrictive assumption of data *missing at random* (MAR) compared to other procedures for treating missing data such as list-wise deletion, which are based on the assumption of *missing completely at random* (MCAR; Little & Rubin, 2002).

**Table 1.** Competing model fits for longitudinal measurement invariance tests

| Models | $\chi^2$ | *df* | $\Delta df$ | $\Delta\chi^2$ | CFI | TLI | RMSEA | SRMR |
|---|---|---|---|---|---|---|---|---|
| Configural model (baseline) | 187.09 | 72 | - | - | .99 | .98 | .03 | .03 |
| Weak invariance | 194.40 | 80 | 8 | 7.31 | .99 | .98 | .03 | .03 |
| Strong invariance | 234.48 | 90 | 18 | 47.39** | .98 | .98 | .04 | .03 |
| Partial strong invariance[a] | 205.80 | 86 | 14 | 18.71 | .99 | .98 | .03 | .03 |
| Strict invariance | 228.48 | 96 | 24 | 41.39* | .98 | .98 | .03 | .05 |
| Partial strict invariance[b] | 212.59 | 95 | 23 | 25.50 | .99 | .98 | .03 | .04 |
| Partial strict invariance plus equal factor variances | 214.45 | 97 | 25 | 27.36 | .99 | .98 | .03 | .04 |

*Note.* $N = 1{,}273$; all models are compared to the configural invariance model; model comparisons indicate full weak, partial strong, and partial strict longitudinal invariance; [a]invariance was relaxed on item 3 at all times, and on items 1 and 5 only at Time 3; [b]invariance was relaxed on item 4 at Time 3. $^{*}p < .05$ $^{**}p < .01$

## Results

### *Longitudinal measurement invariance*

Table 1 shows the results of the longitudinal invariance analysis. The baseline model (configural invariance) has a good model fit ($\chi^2 = 187.09$, $df = 72$, CFI (Comparative Fit Index) = .99, TLI (Tucker Lewis Index) = .98, RMSEA (Root Mean Square Error of Approximation) = .03, SRMR (Standardized Root Mean Square Residual) = .03) indicating that a one-factorial structure represents the data well across all times of measurement. We also tested the one-factorial structure of the CSS separately for every time point (Time 1: $\chi^2 = 18.78$, $df = 5$, CFI = .99, TLI = .98, RMSEA = .04, SRMR = .02; Time 2: $\chi^2 = 19.05$, $df = 5$, CFI = .98, TLI = .97, RMSEA = .05, SRMR = .02; Time 3: $\chi^2 = 16.84$, $df = 5$, CFI = .99, TLI = .98, RMSEA = .05, SRMR = .02). Results indicated a good fit of the one-factorial structure at every time point. In line with Schaubroeck and Green (1989), we interpret this finding as the absence of gamma change for the CSS. In the baseline model and in all comparison models correlations between error variances of corresponding factor indicators were freely estimated (see also Figure 2). The test of full weak invariance showed that the weak invariance model did not differ from the baseline model ($\Delta\chi^2[8] = 7.31$, ns). Therefore, full weak invariance of the CSS was confirmed. The full strong ($\Delta\chi^2[18] = 47.39, p < .01$) as well as the full strict ($\Delta\chi^2[24] = 41.39; p < .01$) invariance models yielded significantly worse $\chi^2$-values compared to the baseline model. Therefore, we used the backward method (relaxing factor loadings suggested by the modification indices) and relaxed the equality constraints of some factor indicators. In case of strong invariance, these relaxed constraints were related to item 3 (see Appendix) for all times of measurement and to items 1 and 5 for Time 3, indicating partial strong invariance ($\Delta\chi^2[14] = 18.71$, ns) for the CSS. Regarding strict invariance, the equality constraints related to item 4 had to be relaxed for Time 3, indicating partial strict invariance ($\Delta\chi^2[23] = 25.50$, ns) for the CSS. Finally, factor variances were the same over time ($\Delta\chi^2[25] = 27.36$, ns).

Summarizing, as we found support for a one-factorial structure with equal factor variances across all time points as well as full weak, partial strong, and partial strict

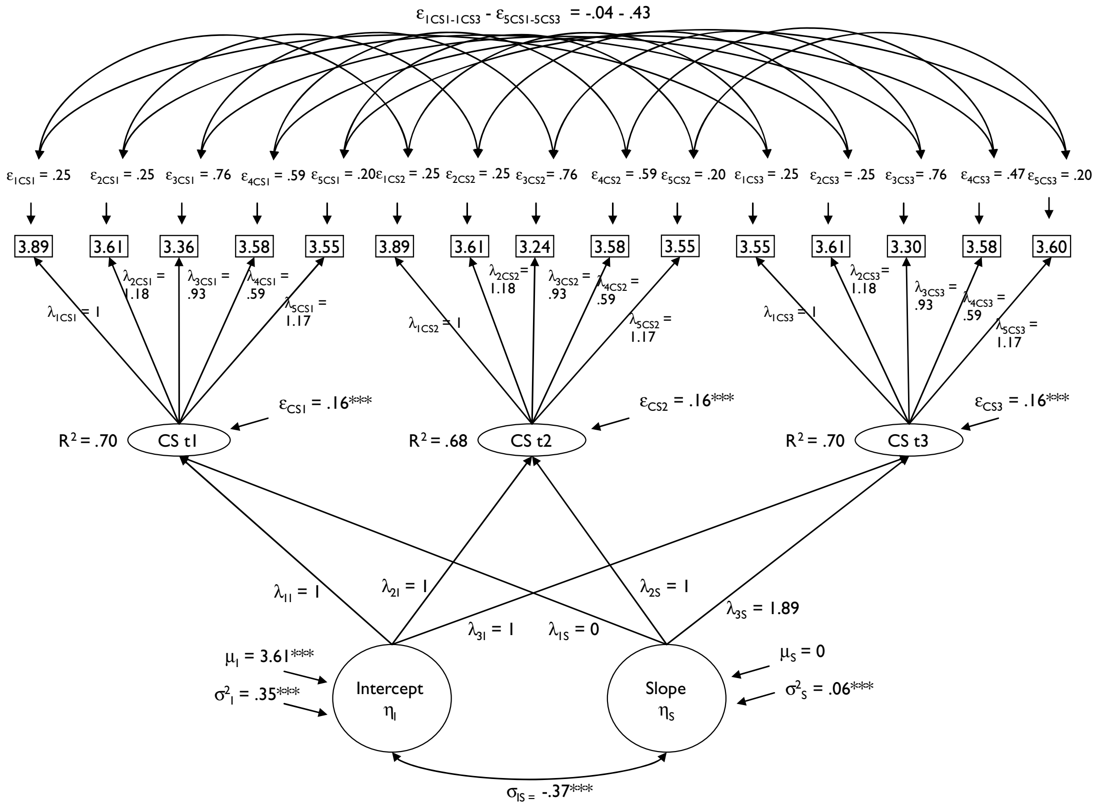


**Figure 2.** Empirical results: longitudinal measurement invariance and multiple indicator latent growth modelling. *Note.* $N = 1{,}273$; $^{***}p < .001$; for all factor loadings (unstandardized estimates displayed) $p < .001$; $\sigma$ = correlations; $\sigma^2$ = variances; $\mu$ = means; $\lambda$ = factor loadings; $\varepsilon$ = error variances; $\eta$ = growth parameters; numbers in rectangular fields represent values of the intercepts of manifest variables; two-headed arrows between error variances represent correlations between error variances of the same indicators over time; factor loadings of the intercept are fixed to 1; factor loadings of the slope are fixed to 0, 1, and 1.89 and represent linear time.

longitudinal invariance, the psychometric preconditions for longitudinal comparisons of CSS mean levels are given (cf. Chan, 1998).

The unstandardized factor loadings of the final model ranged from .48 to .88, all $p$s $< .001$; the intercepts ranged from 3.24 to 3.89, all $p$s $< .001$; the error variances of the manifest variables ranged from .20 to .76, all $p$s $< .001$; and the correlations between error terms ranged from $-.04$ to .43, $p$s ranged from .31 to $< .001$ (cf. Figure 2). The test–retest correlations between the latent constructs were of moderate size ($r_{t1t2} = .62$; $r_{t2t3} = .64$; $r_{t1t3} = .47$, all $p$s $< .001$).

### *Multiple indicator latent growth modelling (MLGM)*

Results can be seen in Figure 2. Linear trajectories fit the data well ($\chi^2 = 215.16$, $df = 97$, CFI = .99, TLI = .98, RMSEA = .03, SRMR = .04). Mean ($\mu_I = 3.61$, $p < .001$) and variance ($\sigma_I^2 = .35$, $p < .001$) of the intercept and variance ($\sigma_S^2 = .06$, $p < .001$) of the slope were significant.[1] The slope mean did not significantly differ from zero

[1] *To estimate the mean of the intercept in a multiple indicator latent growth model, we applied a procedure described by Bollen and Curran (2006). We constraint the factor loading of a strong invariant item to 1 and fixed the intercept of this item to zero at every time point. Overall model fit and other growth parameters were not influenced by this approach.*

($\Delta\chi^2[1] = -2.05$, ns). In other words, the initial values in career satisfaction differed significantly from zero and participants differed significantly in their initial values. The significant variance of the slope parameter indicates that there was also variability between intra-individual growth rates. Some respondents became more satisfied with their career over time, some became less satisfied and some did not change at all resulting in no growth at the group level over a time span of 5 years. A significant negative correlation between intercept and slope ($\sigma_{IS} = -.37, p < .001$) indicates that the higher the initial career satisfaction value, the more it decreased over the 5-year time period.

## Discussion

In this study, we analysed longitudinal measurement invariance of the CSS and modelled intra-individual changes in professionals' career satisfaction as one important indicator of subjective career success in a time interval of 5 years.

### *Theoretical implications*

#### *Longitudinal measurement invariance*

Because we did not find any evidence for gamma change, we conclude that our participants did not redefine or reconceptualize their understanding of career satisfaction over the here analysed 5-year time period.

Since we found full weak invariance of the CSS over time, the intervals of the scale can be regarded as calibrated in the same way (Chan, 1998). This means that the different aspects of career satisfaction as conceptualized by the different items of the CSS (e.g., income, goal attainment, overall success) have the same relative importance over a 5-year time span.

Regarding strong invariance, we found partial strong invariance over time. The finding that item 3 ('I am satisfied with the progress I have made towards meeting my income goals') is the only variant item across all time points is especially noteworthy. Technically, differences in intercepts can occur because of an upward or downward measurement bias in the domain tapped by the specific item (Steenkamp & Baumgartner, 1998). Applied to our study, the differences in intercepts on item 3 mean that even when participants were equally satisfied with their career over time, they gave higher ratings at Time 1 compared to Time 2 and Time 3, and higher ratings at Time 3 compared to Time 2 when answering the item regarding satisfaction with meeting their income goals. An explanation for this finding could be that a stable interpretation of items regarding income over an extended time span may be especially implausible. For example, if life circumstances change (e.g., due to parenthood, marriage, illness) answering questions about income and satisfaction with income might change, too.

We only know one other study that was concerned with measurement invariance of the CSS. Hofmans *et al.* (2008) found that men and women tend to interpret the CSS differently. It might be that the meaning of career satisfaction varies more across gender than across time.

Summarizing, the psychometric properties of the CSS for measuring mean changes in career satisfaction are good and our findings reveal that – apart from the income satisfaction item – there is no beta change. This means that – at least for the time analysed here, that is, for professionals in a time span from 7 to 12 years after graduation – the measurement continuum underlying the construct of career satisfaction is relatively stable over time.

*Multiple indicator latent growth modelling*

According to a taxonomy on different developmental processes provided by Stoolmiller (1994) the developmental pattern we found would be described as the *no mean growth model*. There was a mean level stability of career satisfaction over time, that is, absence of alpha change, but the individual growth trajectories varied to a high extent. The reasons for these differences in intra-individual growth are beyond the scope of the present analysis and should be addressed in future research.

Further, we found that respondents with relatively high initial career satisfaction became less satisfied over time. This finding may on the one hand be interpreted methodologically as a regression towards the mean. On the other hand, it could also imply that people with very high satisfaction at the beginning of their careers are at a higher risk of experiencing a drop in satisfaction compared to people with initially more 'average' levels of satisfaction. Research on unrealistic optimism, for instance, has shown that unrealistically high optimistic expectations ('unrealistic optimism') can have adverse effects on a within-person level (Dillard, Midboe, & Klein, 2009).

According to the *temporal features of a single attribute phenomenon* (cf. Roe, 2008) the *onset* of our analysed phenomenon was 7 years after career entry, a time at which all participants should be able to give a first valid assessment of their career satisfaction. The *duration* was a time period of 5 years in our participants' early career phase. There were no *dynamics* on the mean level within this 5-year time period; however, for the study of career satisfaction the *offset* of the phenomenon was by no means reached in our sample. Ideally, studies should track the phenomenon of career satisfaction until or even beyond retirement.

In summary, our analyses have shown a stable construct of career satisfaction over a 5-year time period. However, our analyses have also shown that despite the absence of alpha change on the group level, intra-individual growth trajectories may vary considerably. Therefore, our findings suggest that a closer inspection of intra-individual growth patterns of career satisfaction is warranted.

### *Practical implications*

From a practical perspective the finding that persons with initially high career satisfaction scores show a steeper decline over time is noteworthy. It may be that very high enthusiasm at the beginning of one's career will lead to disappointment after a while; whereas an initially more 'modest' satisfaction may lead to a more realistic view of one's career. Although persons with initially very high satisfaction scores do not necessarily have the lowest satisfaction levels at the end of the here analysed period, counsellors, and personnel developers should be aware of possible dissatisfaction due to initially too high satisfaction scores. One solution might be to prepare the clients to deal with a potential subjective decline experience in a positive way. Furthermore, special career development tools covering this topic could be developed in order to motivate 'over-satisfiers' over time.

Another important conclusion from this study is that the CSS can be used as an outcome measure in career intervention programmes (cf. Raabe *et al.*, 2007). Shifts in career satisfaction in such programmes may be attributable to true quantitative changes and not to qualitative shifts in the meaning of the construct (cf. de Jonge *et al.*, 2008).

Finally, the applied researcher might consider the possibility to adapt the CSS. Our results suggest that the income satisfaction item might be especially inconclusive for the analysis of alpha change. Therefore, longitudinal mean investigations focusing heavily on satisfaction with income should account for this fact.

### *Limitations, future research, and conclusion*

Three critical issues should be mentioned. First, one might question our use of the backward method as being explorative, yet it is an accepted instrument for identifying partial invariance (Wu *et al.*, 2009). Nevertheless, future research should replicate our findings in a confirmatory fashion. Second, we analysed a specific time span from 7 to 12 years after career entry. Future research should test whether our findings on the stability of career satisfaction can be replicated for other career periods (i.e., later career stages, elderly workers) and also assess career satisfaction more frequently (Roe, 2008). Finally, predictors for different intra-individual change trajectories such as specific field of employment, gender, personality, or job loss/career interruptions should be analysed in the future.

In summary, our study suggests that (a) the CSS is reliable for measuring quantitative individual changes over a time span of 5 years, (b) that career satisfaction as an important facet of subjective career success is a relatively stable construct within the careers of professionals in a time span from 7 to 12 years after graduation, and (c) that individual differences in initial values contribute to intra-individual changes so that persons with higher initial career satisfaction have a steeper decline over time.

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## Appendix

(1) I am satisfied with the success I have achieved in my career.
(2) I am satisfied with the progress I have made towards meeting my overall career goals.
(3) I am satisfied with the progress I have made towards meeting my goals for income.
(4) I am satisfied with the progress I have made towards meeting my goals for advancement.
(5) I am satisfied with the progress I have made towards meeting my goals for the development of new skills.