

# Long-Term Development of Employee Well-Being: A Latent Transition Approach

Anne Mäkikangas<sup>1</sup> · Wilmar Schaufeli<sup>2,3</sup> · Esko Leskinen<sup>4</sup> ·  
Ulla Kinnunen<sup>5</sup> · Katriina Hyvönen<sup>1</sup> · Taru Feldt<sup>1</sup>

Published online: 24 November 2015  
© Springer Science+Business Media Dordrecht 2015

**Abstract** The long-term development of employee well-being is still poorly understood. Consequently, in this three-wave 10-year longitudinal study among Finnish managers ( $n = 402$ ) the development of employee well-being was examined in detail. Specifically, the long-term development of job-related affective well-being was investigated at the intra-individual level, simultaneously taking into account positive and negative indicators of well-being, the level of well-being, and the direction of change. Further, the issue how (changes in) job resources and employee well-being were related across time was examined. By applying a novel person-centered methodology, factor mixture modeling and latent transition analysis, the results revealed that the development of favorable job-related affective well-being was eight times more probable than that of unfavorable development across the 10-year study period. Job resources predicted a high level of job-related well-being and, also, job resources increased along with favorable changes in well-being. Overall, the findings contribute to knowledge in the area of positive occupational health psychology by offering a detailed picture of the level of job-related affective well-being and its development over time.

**Keywords** Job-related affective well-being · Latent transition analysis · Longitudinal · Job resources

---

✉ Anne Mäkikangas  
anne.makikangas@jyu.fi

<sup>1</sup> Department of Psychology, University of Jyväskylä, P.O. Box 35, 40014 Jyväskylä, Finland

<sup>2</sup> Department of Psychology, Utrecht University, Utrecht, The Netherlands

<sup>3</sup> Department of Psychology, KU Leuven, Leuven, Belgium

<sup>4</sup> Department of Mathematics and Statistics, University of Jyväskylä, Jyväskylä, Finland

<sup>5</sup> School of Social Sciences and Humanities, University of Tampere, Tampere, Finland

## 1 Introduction

The long-term development of employee well-being is a poorly understood phenomenon due to methodological gaps in the previous research (Kelloway and Francis 2013). A recent review (Mäkikangas et al. *in press*) showed that longitudinal studies on employee well-being thus far have been mainly based on short-term follow-ups and negative indicators of well-being. Moreover, these studies are methodologically restricted, as they capture only the rank-order stability or the overall variance of stability versus change. To help fill these gaps, the purpose of the present three-wave 10-year longitudinal study was to examine the long-term development of employee well-being in detail, and how this is related to (changes in) job resources over time.

Our study had three specific research targets. These were to investigate (1) well-being profiles over time, (2) employees' transitions across well-being profiles, and (3) the associations between job resources and well-being profiles, and between job resources and transitions between profiles. More knowledge on individual-specific well-being and its long-term development is needed in order to be able to sustain and improve employee well-being and hence extend occupational careers. The study uses a novel analytical method—Latent Transition Analysis (LTA)—which is designed to capture accurately multiform change and its probability (Collins and Lanza 2010). In this study, the development of employee well-being is approached on the viewpoint of the two theories, namely the set-point theory (Headey 2006, 2007) and the life-span theory (Baltes and Baltes 1990; Baltes et al. 1998), which are applied in the occupational health context.

### 1.1 Long-term Development of Job-Related Affective Well-Being

In this study, we conceptualize and measure employee well-being via job-related affective well-being, as proposed by Warr (1990, 1994). According to Warr's theoretical model, job-related affective states are classified into four quadrants that comprise unpleasant affective states of high or low activation, and pleasurable affective states of high or low activation. As subjective well-being is based more on the level of pleasure than on the level of arousal (Feldman 1995), we follow Watson and Tellegen's (1985) model positing that affective states are constituted by two dimensions; positive and negative. The two-factor structure (i.e., positive versus negative job-related affective well-being) of Warr's (1990) scale used in this study has previously been shown to be valid (Mäkikangas et al. 2007).

In the present study, we investigate the long-term development of job-related affective well-being by using updated versions of the set-point (Headey 2006, 2007) and life-span (Baltes and Baltes 1990; Baltes et al. 1998) theories. The original idea of set-point theory, i.e., the Dynamic Equilibrium model (Headey and Wearing 1989; Ormel and Schaufeli 1991) and the Homeostasis model (Cummins et al. 2002), are that each person has a stable, characteristic level of subjective well-being (a 'set-point') which is maintained by adaptive mechanisms. This set-point is determined by genetic predisposition, core personality traits (e.g., neuroticism), and enduring environmental conditions. Positive or negative changes in a person's life or work situation can temporarily disrupt this equilibrium or homeostasis, causing levels of well-being to fluctuate outside of their ordinary, habitual range (i.e., the set-point). However, in due time, individuals return to their usual, characteristic level of well-being through the deployment of adaptive mechanisms, which may be cognitive (e.g., positive relabeling) or behavioral (e.g., problem focused coping) in nature. As a

consequence of these adaptive mechanisms, levels of well-being remain relatively stable over time.

However, empirical findings have challenged the original assumptions of a rigidly stable characteristic level of well-being by showing that (a) some major life events could permanently change the set-point of subjective well-being; (b) the overall level of subjective well-being slightly increased over time; and (c) individual subjective well-being profiles showed heterogeneous developmental paths, although, among the vast majority, subjective well-being was found to be stable (see Headey 2006, 2007). In an attempt to meet these challenges, the updated version of the set-point theory of well-being comes very close to the propositions of the life-span theory emphasizing that development is an ongoing process throughout the life course (Baltes et al. 1998). Basically, development can occur in two directions, i.e., upward and downward, but most life-span theories emphasize the importance of maturation and growth, for instance, of personality and socioemotional development (Charles and Carstensen 2009; Isaacowitz and Blanchard-Fields 2012; Staudinger and Kunzmann 2005). It has been shown that, through self-regulatory processes and increasing maturity, individuals can better maintain and improve their general well-being (Charles and Carstensen 2009) and work-related well-being over time (Scheibe and Zacher 2013). However, studies taking a life-span perspective on employee well-being by covering longer time frames, such as a decade, are largely absent, as shown by a recent systematic review (Mäkikangas et al. [in press](#)).

According to the above-mentioned review, based on 40 longitudinal studies of employee affective well-being (Mäkikangas et al. [in press](#)), previous research has typically covered a time period of only 1.5–3 years, and adopted a negatively biased perspective towards well-being (that is, typically using only ill-being indicators). In addition, long-term development has been depicted mainly from the perspective of rank-order stability, thereby ignoring the other forms of stability, i.e., absolute and ipsative (see Caspi and Roberts 1999). Furthermore, the review revealed that the level of employee well-being was typically high and more volatile than stable over time. Interestingly, the studies with the longest follow-up time (i.e., 10 years) supported the prediction of the updated set-point and life-span theories of an overall favorable development of well-being over time (Baltes et al. 1998; Headey 2006, 2007). For example, Mäkikangas et al. (2011) reported that among the majority (86 %) of employees in their study well-being was at a high level and increased further across the 10-year follow-up, whereas well-being decreased in only a small minority (8 %). In addition, Wu and Griffin (2012) found increased job satisfaction over the last 5-years of their 9-year follow-up period.

In sum, there is a need for a deeper and more comprehensive understanding of the long-term development of job-related affective well-being. This study investigated the development of job-related affective well-being, first, by identifying individual profiles of well-being (i.e., profiles formed by positive and negative indicators), and second, by investigating employees' transitions between these profiles over time. By using LTA (Collins and Lanza 2010; see also Wang and Zhou 2013), we are able to model employees' typical and atypical well-being transitions and their directions over time. By adopting a person-centered approach (Bergman et al. 2003; Laursen and Hoff 2006) we are able to analyze stability and change at the intra-individual level. In addition, we take into account population heterogeneity in the level and change of employees' job-related affective well-being, as proposed in the set-point and life-span theories (Baltes et al. 1998; Headey 2006, 2007). On the basis of the theoretical considerations outlined above (Baltes et al. 1998; Headey 2006, 2007) and previous empirical evidence (for a review, see Mäkikangas et al. [in press](#)), we formulated the following hypotheses:

**Hypothesis 1** Employee profiles typically indicate a high level of job-related affective well-being at each measurement point.

**Hypothesis 2** Employees maintain the same job-related affective well-being profile over time.

**Hypothesis 3** Favorable changes in employees' job-related affective well-being are more likely than negative changes.

## 1.2 Job Resources as Facilitators of Job-Related Affective Well-Being

One of the basic premises of the Job Demands-Resources (JD-R) model (Bakker et al. 2014; Demerouti et al. 2001)—utilized in this study—is that job resources are crucial for employee well-being. According to the JD-R model, job resources are physical, psychological, social, or organizational aspects of the job that help the person to cope with job demands, increase learning and development as an employee, and are useful in achieving work-related goals (Bakker et al. 2014; Demerouti et al. 2001). In the present study, job control and supportive organizational climate were considered job resources which possess motivational potential. Job control refers both to autonomy (i.e., control over the individual's own scheduling and tasks) and to participation in the decision making process (i.e., control over the organizational-decision-making process) (Spector 1998). Supportive organizational climate is defined as an individual's perceptions of the quality of communication and social support in his/her work environment (see Mäkikangas et al. 2007).

Job control and supportive organizational climate are crucial job resources for the target group of the study, i.e., managers (Noblet et al. 2001), but these were also selected for theoretical reasons. First, according to the Self-Determination Theory (Ryan and Deci 2000), both of these job resources help to foster the human needs of autonomy and relatedness (see also Strauss and Parker 2014). Second, these two resources are seen as the main job characteristics in the traditional job stress models (e.g., Demand-Control-Support model; Karasek and Theorell 1990). Furthermore, both job resources have been widely studied and both are related to increased general psychological well-being and job-related well-being (e.g., job satisfaction) (for reviews, see de Lange et al. 2003; Häusser et al. 2010; Mauno et al. 2010; Parker et al. 2003; van der Doef and Maes 1999). The findings emerging from empirical longitudinal studies typically suggest that job resources and employee well-being are reciprocally related, thus mutually influencing each other (Mäkikangas et al. 2010; for a review, see Mäkikangas et al. 2013).

To further investigate the role of job control and supportive organizational climate, we examine how these two job resources are related to job-related affective well-being profiles longitudinally as well as cross-sectionally. In addition, we investigate their role in changes in job-related affective well-being over time, i.e., whether changes in job-related affective well-being co-vary with changes in job resources. Two hypotheses were posited on these relationships:

**Hypothesis 4** Job control and supportive organizational climate predict membership of the high job-related affective well-being profile.

**Hypothesis 5** An increase in job resources is associated with increasing levels of job-related affective well-being, and, vice versa, a decrease in job resources is associated with decreasing levels of well-being.

## 2 Method

### 2.1 Procedure

This research is based on a longitudinal study conducted in three waves over a 10-year period among Finnish managers (FINNMA-10). Data were collected in 1996 (T1), 1999 (T2), and 2006 (T3) (see Feldt et al. 2009; Mäkikangas et al. 2011). The original sample ( $n = 2000$ ) was drawn from the membership registers of two Finnish labor unions, the Union of Technical Employees and the Union of Professional Engineers, in 1996. The sample was drawn from those union members whose occupational title in their membership register indicated a managerial position. In addition, members who were unemployed, laid-off or retired were omitted from the study. After these procedures, a total of 21,000 eligible subjects remained in the membership register of the Union of Technical Employees (total membership in 1996 was 73,000), of whom 1000 were randomly selected for this study. Following the same procedure, 5000 members were left in the register of the Union of Professional Engineers (total membership in 1996 was 34,000), of whom 1000 were randomly selected for this study. Questionnaires were posted to subjects' home addresses at T1. The response rate was 64 % ( $n = 1035$ ) after omitting 389 subjects who did not meet the criterion of "working as a manager" (i.e., 325 subjects returned an unfilled questionnaire mentioning that they did not work in a managerial position, 22 were retired, 42 were unemployed).

The identity number had been torn off from three questionnaires returned at T1, and therefore at T2 questionnaires were sent to 1032 (of the 1035 T1) participants. The response rate at T2 was 70 % ( $n = 635$ ) after 118 participants who no longer fulfilled the study criteria were omitted from the sample (i.e., 73 participants were no longer in a managerial position and 42 participants had retired).

At T3, all the original study participants from T1 were included in the sample. Questionnaires were posted to 998 participants (out of 1035 at T1), as 37 participants could not be contacted owing to their address being withheld, a torn-off participant ID, or their decease during the study. The response rate at T3 was 78 % ( $n = 785$ ). The response rates at all three measurement times were good: 51 % ( $n = 529$ ) of the participants responded at all three measurement times, 35 % ( $n = 362$ ) responded on two occasions (either T1 and T2, or T1 and T3), and 14 % ( $n = 144$ ) responded only at T1.

### 2.2 Participants

The present study comprises all the participants who responded and were employed and filled in the job-related affective well-being questionnaire at all three measurement times ( $n = 402$ ). Participants were mainly men (95 %), and at T1 they were 24–59 years old ( $M = 41.9$  years;  $SD = 6.9$  years). At T1, the majority of the participants had a permanent employment contract (98 %) and 27 % worked in upper, 41 % in middle, and 32 % in lower management. The corresponding percentages at T3 were 26, 50 and 21 %. At T1, they worked mainly in the technical field, since 55 % of the participants had a degree in engineering, 31 % were technicians, and 5 % had graduated from a vocational college. Less than one percent of the participants had a higher university degree, while the remaining participants had some other type of vocational education (6 %), or no professional education (2 %). At T3, the participants had worked on average 16.3 ( $SD = 11.68$ ) years for the same employer and 9.8 ( $SD = 8.33$ ) years in the same job.

**Table 1** Correlations and reliabilities of the study variables ( $n = 402$ )

Variables	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Comfort T1	3.15	0.81	<b>.79</b>																
2. Comfort T2	3.35	0.91	.48	<b>.83</b>															
3. Comfort T3	3.61	0.96	.43	.41	<b>.85</b>														
4. Enthusiasm T1	3.78	0.84	.57	.39	.36	<b>.82</b>													
5. Enthusiasm T2	3.83	0.87	.40	.71	.34	.55	<b>.85</b>												
6. Enthusiasm T3	3.89	0.96	.40	.37	.73	.51	.45	<b>.87</b>											
7. Anxiety T1	3.06	0.84	-.43	-.37	-.34	-.18	-.21	-.25	<b>.73</b>										
8. Anxiety T2	2.95	0.85	-.23	-.51	-.31	-.12	-.31	-.22	.58	<b>.78</b>									
9. Anxiety T3	2.78	0.92	-.24	-.22	-.59	-.11	-.10	-.40	.50	.47	<b>.78</b>								
10. Depression T1	2.09	0.81	-.43	-.31	-.29	-.41	-.29	-.28	.62	.37	.35	<b>.83</b>							
11. Depression T2	1.98	0.86	-.26	-.56	-.28	-.26	-.49	-.25	.43	.70	.31	.52	<b>.85</b>						
12. Depression T3	1.87	0.81	-.24	-.22	-.57	-.24	-.20	-.56	.31	.32	.63	.40	.37	<b>.84</b>					
13. Job control T1	4.18	0.56	.25	.14	.23	.37	.26	.34	-.03	-.07	-.05	-.20	-.09	-.16	<b>.75</b>				
14. Job control T2	4.17	0.59	.20	.35	.21	.34	.47	.32	-.10	-.20	-.02	-.22	-.30	-.09	.56	<b>.80</b>			
15. Job control T3	4.26	0.62	.20	.18	.41	.30	.23	.55	-.13	-.10	-.18	-.20	-.09	-.38	.46	.44	<b>.81</b>		
16. Org. climate T1	3.23	0.85	.31	.19	.19	.32	.22	.23	-.27	-.18	-.17	-.32	-.18	-.16	.27	.24	.18	<b>.83</b>	
17. Org. climate T2	3.31	0.87	.27	.42	.25	.28	.44	.32	-.21	-.31	-.22	-.23	-.39	-.23	.19	.40	.23	.44	<b>.84</b>
18. Org. climate T3	3.60	0.86	.24	.18	.41	.20	.13	.43	-.18	-.15	-.30	-.23	-.10	-.32	.23	.25	.45	.32	.38

If  $r \geq 1.111$ ,  $p < .05$ ,  $r \geq 1.181$ ,  $p < .001$ . Org. climate = supportive organizational climate. Cronbach's alphas are presented at diagonal (bolded)

## 2.3 Measures

*Job-related affective well-being* was measured by Warr's (1990) 12-item scale in which participants evaluated the positive and negative feelings they had experienced in their current job during the past few weeks. Each of the four dimensions of the scale were measured by three adjectives: *comfort* (relaxed, contented, calm), *enthusiasm* (optimistic, enthusiastic, cheerful), *anxiety* (worried, tense, uneasy), and *depression* (depressed, gloomy, miserable). Responses were given on a frequency-based six-point scale (1 = never, 6 = all of the time).

*Job control* was measured by four items. Managers indicated on a 5-point scale (1 = not at all, 5 = very much) to what extent their current job offered (1) independence, (2) responsibility, (3) opportunities to use their own skills, and (4) control over their own work. Evidence from the present dataset on construct validity and factor loading invariance over the first two measurements has been provided earlier (see Feldt et al. 2004; Mäkikangas et al. 2007).

*Supportive organizational climate* was assessed with four items concerning the general social climate in the organization and assistance from colleagues (e.g., "Our workplace is dominated by an atmosphere of openness and solidarity", "We operate openly and constructively in our workplace") (see Feldt et al. 2004; Mäkikangas et al. 2007). Managers were asked to answer each item on a 5-point scale (1 = totally agree, 5 = totally disagree). The scale was reverse-scored, so that a higher score indicated a supportive organizational climate. Factor structure and factorial invariance over the first two measurements has previously been tested in the present dataset (see Feldt et al. 2004; Mäkikangas et al. 2007).

The means, standard deviations and correlations between the study variables, together with the reliability information, are given in Table 1.

## 2.4 Attrition Analyses

The persons included in the present study ( $n = 402$ ) were compared to those who participated only at T1 ( $n = 633$ ) in their background variables (gender, age, managerial level), job-related affective well-being (anxiety, depression, comfort, enthusiasm) and job resources (job control, supportive organizational climate). The study sample was representative of all the participants with respect to their levels of job-related affective well-being and job resources, as no significant differences were observed at T1 between the study participants and the T1-only participants in anxiety,  $t(1031) = 0.17$ ,  $p = .87$ , depression,  $t(1031) = -1.67$ ,  $p = .09$ , comfort,  $t(1031) = 0.59$ ,  $p = .55$ , enthusiasm,  $t(1031) = 1.23$ ,  $p = .22$ , job control,  $t(1033) = 1.47$ ,  $p = .23$ , or supportive organizational climate,  $t(1029) = 0.32$ ,  $p = .57$ . In addition, no gender differences were found,  $\chi^2(1) = 0.58$ ,  $p = .39$ . However, the present participants were significantly younger ( $M = 41.9$  years) than the T1-only participants ( $M = 45.2$  years):  $t(1029) = -0.62$ ,  $p < .001$ . This result is explained by the exclusion of retirees from the present sample. Also at T1, slightly more of the present than T1-only participants were working in middle management,  $\chi^2(2) = 7.95$ ,  $p < .05$ .

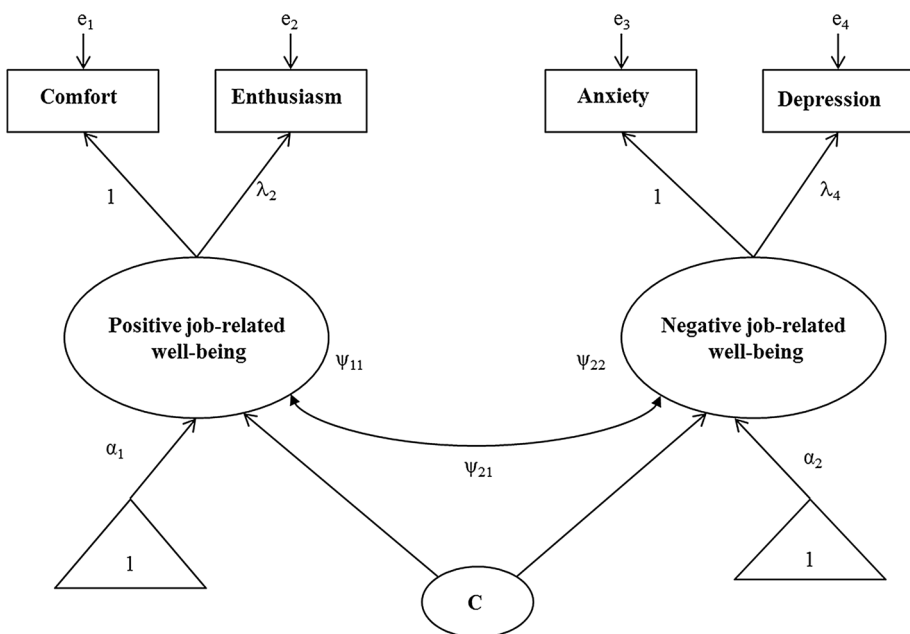
## 2.5 Statistical Analysis

The statistical analyses comprised five phases. In the *first phase*, confirmatory factor analysis (CFA) was used to test the two-factor structure of job-related affective well-being

at each of the three time points separately. The two-factor model comprised the latent factors of positive job-related affective well-being and negative job-related affective well-being. These factors were allowed to correlate (see Fig. 1). This two-factor factor model was based on the theory of affective states (Watson and Tellegen 1985). In addition, previous studies have shown that this two-factor model adequately describes the structure of the job-related affective well-being scale used in the present study (Mäkikangas et al. 2007). The CFA was performed using the Mplus statistical package (Version 6; Muthén and Muthén 1998–2010). The parameters of the models were estimated using maximum likelihood estimation with robust standard errors (MLR estimator; Muthén and Muthén 1998–2010).

The goodness-of-fit of the CFA model was evaluated using the  $\chi^2$  value (Bollen 1989). In addition, various alternative model fit indices were used: (a) the Root Mean Square Error of Approximation (RMSEA; Steiger 1990), for which values of .05 or less indicate a good fit, values .06–.08 an adequate fit, and values close to .10 a mediocre fit (Schermele-Engel et al. 2003); (b) the comparative fit index (CFI; Bentler 1990); and (c) the Tucker-Lewis index (TLI; Tucker and Lewis 1973), for which values above .95 indicate an acceptable fit (Schermele-Engel et al. 2003).

In the *second phase*, Factor Mixture Modelling (FMM), which explores unobserved heterogeneity in a population by establishing latent classes (Lubke and Muthén 2005; Muthén and Muthén 1998–2010), was used to identify subgroups of job-related affective well-being. FMM is a person-centered method that groups individuals into classes on the basis of empirically distinct patterns of mean levels of variables (in this case positive and negative job-related affective well-being factors) (Lubke and Muthén 2005) (see Fig. 1). In the present study, we applied FMM to test what kinds of job-related affective well-being



**Fig. 1** Estimated factor mixture model for job-related affective well-being. *Note:* C Categorical latent variable



profiles (i.e., latent classes) would emerge separately in each of the three measurement waves.

Various criteria were used to determine the adequate number of latent classes (Muthén 2003; Nylund et al. 2007): (a) the Akaike Information Criterion (AIC); (b) the Bayesian Information Criterion (BIC); (c) the adjusted Bayesian Information Criterion (aBIC); (d) the classification quality as determined by entropy values (entropy values range from 0 to 1, where values close to 1 indicate clear classification; Celeux and Soromenho 1996); (e) the Lo-Mendell-Rubin (LMR) test; (f) the Vuong-Lo-Mendel-Rubin (VLMR) test; (g) the Bootstrap Likelihood Ratio Test (BLRT); and (h) the usefulness and clarity of the latent classes in practice. The model with the smallest AIC, BIC and aBIC values is considered to be superior. The VLMR, LMR and BLRT tests compare solutions with different numbers of latent classes. For all of these tests, a  $p$  value of lower than .05 indicates that the solution with  $k$  classes fits the data better than the solution with  $k - 1$  classes.

In the *third phase*, Latent Transition Analysis (LTA) was used to investigate the stage-sequential, longitudinal developmental patterns of job-related affective well-being. LTA models patterns of stability and change in a discrete latent variable over time (Collins and Lanza 2010; Muthén and Muthén 1998–2010). In the present study, the latent classes obtained on the basis of FMM were used in the LTA. Membership of latent classes is dynamic, and thus participants may transition between classes over time (Collins and Lanza 2010). At each time point, LTA estimates the proportion of individuals in each class and the probability of being in a particular latent status class at Time T, which is conditional on latent status class membership at Time T-1 (Collins and Lanza 2010). The transition probabilities range between 0 (no transitions have occurred) and 1 (all members of one class transitioned to another class). Transition patterns are presented as a transition probability table, in which a row represents the initial status, consisting of the conditional probabilities of belonging to a certain latent status class at a later time. The sum of the elements in each row is one, i.e., 100 %. Probabilities for favorable and unfavorable transition patterns were also ascertained by calculating odd ratios for them. This was done in order to highlight and compare typical and atypical transitions.

In the *fourth phase*, logistic regression analyses were used to examine the extent to which job resources (i.e., job control and supportive organizational climate) predicted membership of the job-related affective well-being classes. Finally, in the *fifth phase*, the possible mean level changes in job resources were investigated in each mover transition pattern across both time periods (from Time 1 to Time 2, and Time 2 to Time 3) by using repeated measures analysis of variance. The FMM, LTA and logistic regression analyses were performed using the Mplus statistical package (Version 6; Muthén and Muthén 1998–2010). Repeated measures analysis of variance was performed by using IBM SPSS Statistics.

### 3 Results

#### 3.1 The Structure of Job-Related Affective Well-Being

Table 2 presents the results of the CFA for the two-factor structure of job-related affective well-being. As shown, the estimated model fitted well to the data at all three measurements. Thus, the model separating positive (i.e., comfort and enthusiasm) and negative

**Table 2** Estimation results of parameters and goodness-of-fit indices for the two-factor structure of affective well-being ( $n = 402$ ) (standard error in parenthesis)

Estimated two-factor model	Parameters				Goodness-of-fit indices						
	Mean $\alpha_1$	Mean $\alpha_2$	Cov $\psi_{21}$	Var $\psi_{11}$	Var $\psi_{22}$	$\chi^2$	df	p value	CFI	TLI	SRMR
Time 1	3.15 (.04)	3.06 (.04)	-.30 (.04)	.64 (.04)	.46 (.06)	3.188	1	.074	.995	.973	.022
Time 2	3.35 (.05)	2.95 (.04)	-.39 (.04)	.81 (.05)	.47 (.06)	3.635	1	.057	.996	.978	.020
Time 3	3.61 (.05)	2.78 (.05)	-.52 (.05)	.91 (.05)	.56 (.06)	1.857	1	.173	.999	.992	.012

Factor 1 = Positive job-related affective well-being; Factor 2 = Negative job-related affective well-being

(i.e., anxiety and depression) job-related affective states adequately described the underlying structure of the employees' affective states. The results of the CFA showed further a trend for an increase over time in the association between Positive and Negative job-related affective well-being factors (see Table 2). In addition, the mean level of the Positive job-related affective well-being factor increased while the mean level of the Negative job-related affective well-being factor decreased over time (see Table 2).

### 3.2 Factor Mixture Model for Job-Related Affective Well-Being

Table 3 presents the fit indices for the solutions with different numbers of latent classes for the job-related affective well-being factors found in the FMM analyses. As shown, all the tests, together with the BIC and aBIC, supported a two-class solution at Time 1 and Time 2; this solution was therefore selected for further analysis. However, at Time 3, the fit indices were not in clear agreement on the number of classes. Further inspection, however, indicated that the difference between the two- and three-class solutions was negligible. More specifically, in the three-class solution, the largest class split into two subclasses with identical well-being profiles that differed only slightly in mean levels (i.e., high levels of positive and low levels of negative job-related affective well-being). Hence, the two-class solution was chosen for the subsequent LTA analyses at Time 3 as well, as it was meaningful in relation to the interpretability and applicability of the class solution. Also, the entropy values supported this class solution (see Table 3). Thus, on every measurement occasion, two classes best captured the heterogeneity of job-related affective well-being.

Table 4 shows the results of the two-class solution in more detail at all three time points. The majority of the employees belonged to Class 1 (78–96 % depending on the time point),

**Table 3** Fit indices for factor mixture models of job-related affective well-being with different numbers of latent classes

Number of latent classes	AIC	BIC	aBIC	Entropy	VLMR <i>p</i> value	LMR <i>p</i> value	BLRT <i>p</i> value	Latent class proportions
<i>Time 1</i>								
1	3476	3528	3487	–	–	–	–	402
2	3454	3518	3467	.70	.059	.066	.001	313/89
3	3452	3528	3468	.57	.249	.263	.158	223/131/48
<i>Time 2</i>								
1	3402	3454	3413	–	–	–	–	402
2	3345	3409	3358	.93	.004	.005	.001	385/17
3	3342	3418	3358	.59	.607	.624	.167	186/191/25
<i>Time 3</i>								
1	3513	3565	3521	–	–	–	–	402
2	3472	3536	3485	.88	.064	.073	.001	373/29
3	3439	3515	3455	.73	.004	.006	.001	187/186/29

*AIC* Akaike information criterion, *BIC* Bayesian information criterion, *aBIC* adjusted Bayesian information criterion, *VLMR* Vuong-Lo-Mendell-Rubin test, *LMR* Lo-Mendell-Rubin test, *BLRT* Bootstrap-likelihood-ratio test

**Table 4** Estimated mean profiles for the factor mixture models in different latent classes for job-related affective well-being (standard error in parenthesis)

	Factor 1 Mean	Factor 2 Mean
<i>Time 1</i>		
Class 1 ( <i>n</i> = 313)	3.256 (.049)	2.735 (.069)
Class 2 ( <i>n</i> = 89)	2.807 (.105)	4.106 (.095)
<i>Time 2</i>		
Class 1 ( <i>n</i> = 385)	3.421 (.057)	2.845 (.053)
Class 2 ( <i>n</i> = 17)	2.164 (.182)	4.714 (.453)
<i>Time 3</i>		
Class 1 ( <i>n</i> = 373)	3.713 (.065)	2.632 (.070)
Class 2 ( <i>n</i> = 29)	2.413 (.197)	4.425 (.318)

Factor 1 = Positive job-related affective well-being; Factor 2 = Negative job-related affective well-being

which was characterized by high levels of positive and low levels of negative job-related affective states. Hence, the class was labeled “High job-related affective well-being”. In the second latent class, the relation between positive and negative affective states was reversed, as the employees in this class reported relatively high levels of anxiety and depression, and simultaneously low levels of comfort and anxiety. Hence, Class 2 was referred to as “Low job-related affective well-being”, and included 22 % of the participants at Time 1, and 4 and 7 % of the participants at Times 2 and 3, respectively. As the majority of the employees belonged to the profile indicating high job-related affective well-being, Hypothesis 1 was supported.

### 3.3 Latent Transition Analysis

Latent transition analysis was performed in two steps: first by modeling the transitions from T1 to T2, and next by modeling the transitions from T2 to T3. The entropy values for both LTA models were high, at .86 (T1 → T2) and .94 (T2 → T3), respectively, indicating good classification quality for both models. The transition probabilities for both time intervals are presented in Table 5. As shown, about 95 % of the participants belonging to Class 1 (“High job-related affective well-being”) remained in that class throughout the study period. Thus, Hypothesis 2, expecting high maintenance of the well-being profile, was supported. The probability of remaining in Class 2 (“Low job-related affective well-being”) was substantially lower, varying from 28 to 31 % depending on the time point (see Table 5). The mean level profiles of these stayer transition patterns are shown in Fig. 2. As can be seen from this figure, among the stayers in Class 1 (i.e., “High level of job-related affective well-being”), the mean levels of job-related affective well-being indicators developed in a slightly favorable direction over time. That is, positive well-being increased, and negative well-being decreased.

The mover transition probabilities showed that employees who initially belonged to Class 2 (“Low job-related affective well-being”) typically transitioned to Class 1 (“High job-related affective well-being”) over time (see Table 5). The probabilities for this favorable development varied between 69 and 72 %. In contrast, the probability of the reverse, unfavorable developmental pattern, i.e., transitioning from Class 1 (“High job-related affective well-being”) to Class 2 (“Low job-related affective well-being”), was about 5 %. Thus, Hypothesis 3, which posited the favorable development of well-being

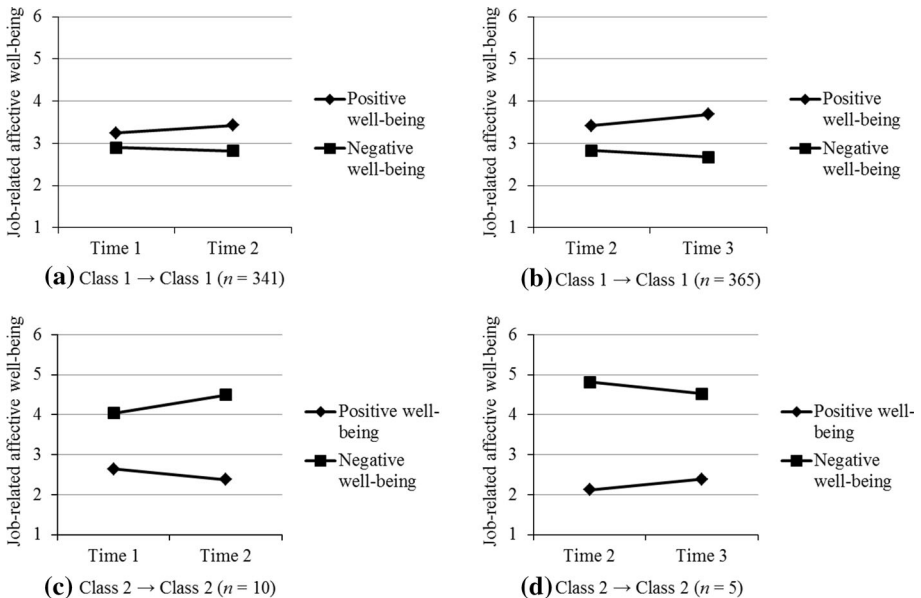
**Table 5** Transition probabilities and frequencies (in parenthesis) (*n* = 402)

		Time 2		
		Class 1	Class 2	Total
Time 1				
Class 1		.957 (341)	.043 (14)	1.00 (355)
Class 2		.722 (37)	.278 (10)	1.00 (47)
		Time 3		
		Class 1	Class 2	Total
Time 2				
Class 1		.946 (365)	.054 (19)	1.00 (384)
Class 2		.691 (13)	.309 (5)	1.00 (18)

Class 1 = High job-related affective well-being; Class 2 = Low job-related affective well-being

over time, was supported. The mean level profiles of the transition patterns of movers are presented in Fig. 3. These patterns show that both transition rates manifested themselves clearly in terms of mean-level changes over time. That is, those who shifted towards high well-being showed a clear increase in positive and a decrease in negative job-related affective states. The reverse mean-level change pattern was observed among those who transitioned towards poorer well-being.

In addition to estimating transition probabilities, favorable versus unfavorable development was compared by using odds ratios. The odd ratios for favorable development (meaning either remaining in the “High job-related affective well-being” class or transitioning to it) were 7.91 from T1 to T2 and 8.60 from T2 to T3. Overall, these odd ratios indicate that favorable development patterns were more likely than unfavorable developmental patterns.



**Fig. 2** Mean level profiles of latent stayer transition patterns

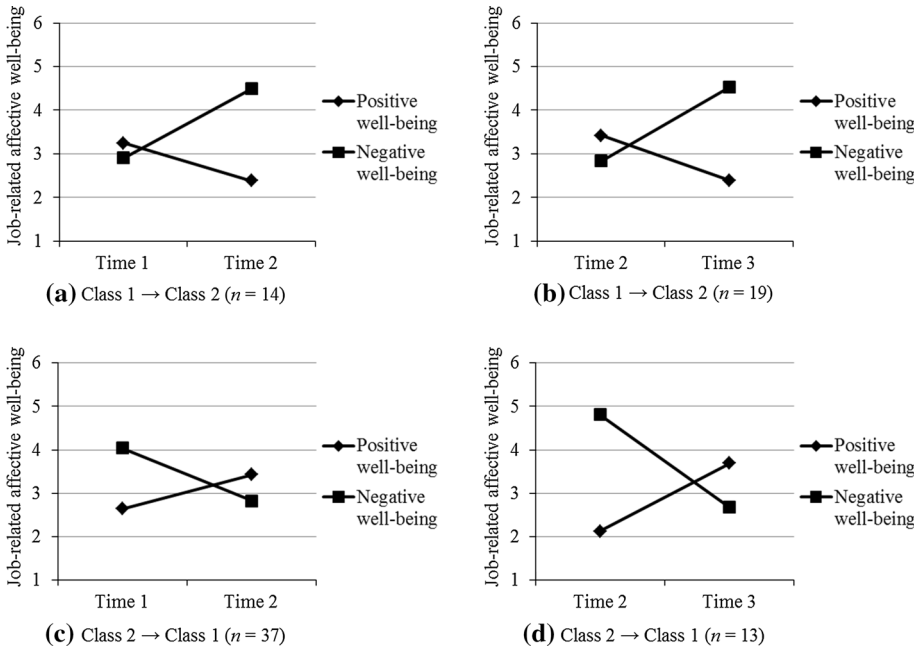


Fig. 3 Mean level profiles of latent mover transition patterns

### 3.4 Job Resources and Job-Related Affective Well-Being Classes

Logistic regression analyses were performed to investigate whether job resources predicted the membership of the latent job-related affective well-being classes (see Table 6). The results showed that both job control and supportive organizational climate increased the probability of belonging to the “High job-related affective well-being” class at each measurement time. Thus, Hypothesis 4 was supported. The positive associations between job resources and belongingness of favorable job-related affective well-being class strengthened over time. In addition, job resources predicted the membership of “High job-related affective well-being” class over time in 5 out of 6 cases (see Table 6).

The role of job resources in the changes in job-related affective well-being was further investigated by focusing on employees who transitioned to the other class over time (see Fig. 3). Using repeated measures analysis of variance, possible mean level changes in job control and supportive organizational climate within each *mover* transition class were analyzed. The results revealed that those who transitioned from the low to the high job-related affective class showed a statistically significant increase in job control:  $F(1,36) = 4.617, p = .038$  Time 1–Time 2, and  $F(1,12) = 18.84, p < .001$  Time 2–Time 3. The average mean levels increased from 3.93 to 4.14 during the first time period and from 3.46 to 4.33 during the second period. Similar findings were obtained for supportive organizational climate:  $F(1,33) = 16.06, p < .001$  Time 1–Time 2 ( $M = 2.58$  Time 1,  $M = 3.38$  Time 2), and  $F(1,11) = 17.09, p < .01$  Time 2–Time 3 ( $M = 2.41$  Time 2,  $M = 3.9$  Time 3).

Among those who transitioned from Class 1 to Class 2 over time, i.e., towards lower well-being, the changes from Time 1 to Time 2 in the mean levels of job control and

**Table 6** Job resources as predictors of job-related affective well-being classes: logistic regression analysis results

	Class 1 versus Class 2 Time 1		Class 1 versus Class 2 Time 2			Class 1 versus Class 2 Time 3		
	$\beta$ (s.e.)	<i>p</i> value	$\beta$ (s.e.)	<i>p</i> value	OR (95 % CI)	$\beta$ (s.e.)	<i>p</i> value	OR (95 % CI)
Job control T1	1.15 (.53)	.029	.80 (.56)	.154	2.22 (.89–5.56)	1.24 (.15)	<.001	3.46 (1.51–7.94)
Org. climate T1	1.28 (.49)	.009	.63 (.28)	.023	1.87 (1.19–2.14)	.65 (.27)	.016	1.91 (1.23–2.98)
Job control T2			1.48 (.07)	<.001	4.41 (2.60–7.46)	.95 (.24)	<.001	2.59 (1.75–3.83)
Org. climate T2			1.26 (.29)	<.001	3.53 (2.21–5.65)	.84 (.10)	<.001	1.31 (1.57–3.39)
Job control T3						1.90 (.28)	<.001	6.66 (4.20–10.56)
Org. climate T3						1.28 (.22)	<.001	3.59 (2.51–5.15)

Org. climate = supportive organizational climate. Class 1 = High job-related affective well-being; Class 2 = Low job-related affective well-being

supportive organizational climate were not significant:  $F(1,13) = .90$ ,  $p = .36$  and  $F(1,13) = .349$ ,  $p = .08$ , respectively. From Time 2 to Time 3, changes in the mean level of supportive organizational climate were not detected either:  $F(1,17) = 2.38$ ,  $p = .14$ . However, the level of job control decreased significantly from Time 2 to Time 3:  $F(1,18) = 5.84$ ,  $p = .03$ . Inspection of the mean levels revealed that although the changes were largely non-significant, the mean level of job resources tended to decrease over time among employees with unfavorable transitions. Hypothesis 5, positing that the changes in job-related affective well-being and job resources were connected, was partially supported.

## 4 Discussion

This study yielded new knowledge about employee well-being transitions and their direction over a period spanning one decade. The main findings indicate that the majority of the participants experienced higher levels of positive than negative job-related affective well-being states and that employee well-being typically developed in a positive direction over the 10-year time period. Favorable employee well-being development over time was eight times more probable than unfavorable development.

### 4.1 Favorable Transitions Typical

With the help of LTA, we were able—for the first time—to investigate changes in profiles of employee well-being over a long period at the intra-individual level. We found, first, that employees typically maintained the same profile and ratio of job-related affective well-being over time. In particular, employees in the favorable well-being class (“High job-related affective well-being”) at the first time point tended to remain in the same class throughout the 10-year study period. This class showed a .95 stability rate. Moreover, inspection of mean levels among this high well-being class revealed that well-being tended to develop in a favorable direction over time, i.e., the mean level of positive well-being slightly increased and that of negative well-being decreased.

In addition to the observed continuity in job-related affective well-being, discontinuity was also found among a minority of the participants, that is, among 13 % over a 3-year time span and among 8 % over a 7-year time span. In practice, these transitions meant that the level as well as the ratio of job-related affective well-being changed: for example, in the favorable transition, positive well-being states became more predominant, while negative states simultaneously declined. Favorable changes in well-being were more the rule than unfavorable changes: the probabilities of a favorable transition over time were 69–72 %, whereas the probabilities of an unfavorable transition were only 4–5 %. Furthermore, more transitions occurred during the first time span, which was shorter (i.e., 3 years), than in the second time span, which lasted 7 years. However, the direction of the transitions was independent of the length of the follow-up time.

Overall, the study findings showed that over a 10-year study period, remaining in, or gravitating to, the more favorable employee well-being group was about eight times more likely than remaining in, or gravitating to, the unfavorable well-being group. This positive development in employee well-being can be explained by the updated set-point theory (Headey 2006, 2007) and life-span theory (Baltes et al. 1998), as these theories not only take diversity in developmental paths into account, but also highlight positive development over time. The majority of the study participants remained in the same high well-being



class throughout and simultaneously showed a slight positive development in mean level change. Thus, this finding agrees with the long-term development of well-being assumed by the set-point (Headey 2006, 2007) and life-span (Baltes et al. 1998) theories. In addition, heterogeneous developmental paths were also found, as in approximately one in ten of the participants considerable changes in well-being were evident. This finding was expected on the basis of the set-point theory, which assumes that while among the majority well-being is stable over time, a minority also exists among whom drastic and permanent well-being changes will occur (Headey 2006, 2007).

According to a recent review (Mäkikangas et al. *in press*), employee well-being stabilizes with aging in both rank-order and absolute stability. The positive development over time detected in the present study might, at least partly, be explained by age-related maturation (Baltes and Baltes 1990). It has been shown that, through self-regulatory processes and with increasing maturity, individuals can better maintain and improve their general well-being (Charles and Carstensen 2009) and work-related well-being over time (Scheibe and Zacher 2013). In addition, older employees with more work experience might be better adjusted to cope with various stressors (Mauno et al. 2013), i.e., reactivity to different stressors differs as a function of age (Scheibe and Zacher 2013).

The same kind of maturation and growth found in the present study has also been found in personality development, where an individual's growth toward maturity is manifested by their becoming increasingly emotionally stable, productive, and involved in society (Caspi et al. 2005; McCrae and Costa 2006). The level hypothesis, i.e., that individuals with a high level of positive personality traits tend to maintain their high level of well-being (Antonovsky 1987; see also Feldt et al. 2011), could also be a useful theoretical underpinning when seeking to explain the long-term development of employee well-being. According to the level hypothesis, among those with a low level of positive personality traits, stability of well-being is also lower (Antonovsky 1987; see also Feldt et al. 2011). This disparity is assumed to arise from generalized resistance resources: high level resource individuals with better and flexible coping strategies are more capable of bringing these into play when facing various life stressors (Antonovsky 1987). Thus, these individuals are able to better protect and also increase various resources (see also Brockner 1983; Hobfoll 1989). The level hypothesis could therefore explain why large changes in the mean levels of well-being were more evident among participants with a low rather than with a high level of job-related affective well-being.

Job resources and job-related affective well-being and changes in these were positively related, which agrees with existing findings (for reviews, see de Lange et al. 2003; Häusser et al. 2010; Mauno et al. 2010; Parker et al. 2003; van der Doef and Maes 1999). Thus, as expected, high levels of job control and supportive organizational climate were typically found in the high job-related affective well-being class. Moreover, these job resources simultaneously increased with favorable well-being transitions whereas, as the additional analysis showed, managerial levels and promotions were not related to the well-being classes or transition patterns. However, although a decline in well-being was accompanied by a slight but non-significant decrease in job resources, this was not explained by job resources: instead, job resources better explained positive than negative well-being development. It might be that as well-being increased, the participants were able to better utilize the motivational potential of their job resources. Altogether, consistent with the JD-R model and research findings (Bakker et al. 2014; Demerouti et al. 2001), the above finding offers evidence that both job control and supportive organizational climate are important for the experience of employee well-being.

## 4.2 Limitations

This study has some limitations that are important to bear in mind when interpreting the findings. First, the sample was selected for the purpose of answering the main study question on job-related affective well-being, and therefore all participants were employed on each measurement occasion. This selection may, however, have biased the findings on the development of job-related well-being in a more positive direction, although the attrition analysis did not reveal evidence of the healthy worker effect. Second, the present sample of managers consisted mostly of men employed in technical fields, which limits the generalizability of the results. Hence, the long-term development of employee well-being should also be investigated with samples drawn from a wider variety of occupations and industries. This is important, as the job-related well-being of managers has been found to be at a high level (Kinnunen et al. 2008; Mäkikangas et al. 2012), and therefore comparisons with other occupational status groups are also needed. Third, although the favorable well-being development found here was in accordance with particular theories (Baltes et al. 1998; Headey 2006, 2007), the present findings may also reflect employee well-being development during economic growth in welfare countries where the state plays an active role in supporting its citizens. Therefore, cross-cultural and country comparisons during different economic times are needed to further validate the current findings in other settings. Fourth, although the sample was heterogeneous in age, we were not able to investigate well-being development within specific age cohorts, which would provide more comprehensive knowledge on well-being over different stages of the career. Fourth, the present study focused on identifying latent classes of employee well-being and uncovering transitions between them over time. However, further research is needed to assess the relevance of various career events (e.g., job change, unemployment) and other potential factors that impact well-being (e.g., diseases) for transitions in well-being. Finally, it has to be remembered that the results relating to job resources and job-related affective well-being do not imply causal relations; they only show parallel changes in job resources and job-related well-being.

## 5 Conclusions

We consider the present investigation an important empirical attempt to analyze the development of employee well-being as a complex phenomenon, simultaneously taking into account *positive* and *negative* indicators of well-being, and the *direction* and *level* of well-being at the intra-individual level. On the basis of the main results, the following three conclusions can be drawn: *First*, employee well-being typically remains at the same (high) level over time; *second*, favorable well-being development is eight times more probable than unfavorable well-being development; and *third*, job resources are an essential factor in the generation of high levels of employee well-being. Thus, these findings contribute to knowledge in the area of positive occupational health psychology. Furthermore, the set-point (Headey 2006, 2007) and life-span (Baltes et al. 1998) theories, in combination with the level hypothesis (Antonovsky 1987), proved to be an appropriate theoretical explanation for long-term development also in the occupational health context.

**Acknowledgments** The FINNMA-10 research project was financed by the Finnish Work Environment Fund (Grant No. 105363). This study was supported by a grant from the Academy of Finland to Anne Mäkikangas (Grant No. 258882).

## References

- Antonovsky, A. (1987). *Unraveling the mystery of health. How people manage stress and stay well*. San Francisco: Jossey-Bass.
- Bakker, A., Demerouti, E., & Sanz-Vergel, A. I. (2014). Burnout and work engagement: The JD-R approach. *Annual Review of Organizational Psychology and Organizational Behavior, 1*, 389–411. doi:[10.1146/annurev-orgpsych-031413-091235](https://doi.org/10.1146/annurev-orgpsych-031413-091235).
- Baltes, P. B., & Baltes, M. M. (1990). Psychological perspectives on successful aging: the model of selective optimization with compensation. In P. B. Baltes & M. M. Baltes (Eds.), *Successful aging: Perspectives from the behavioral sciences* (pp. 1–34). New York: Cambridge University Press. doi:[10.1017/CBO9780511665684](https://doi.org/10.1017/CBO9780511665684).
- Baltes, P. B., Lindenberger, U., & Staudinger, U. M. (1998). Life-span theory in developmental psychology. In W. Damon & R. M. Lerner (Eds.), *Handbook of child psychology—Volume 1: Theoretical models of human development* (5th ed., pp. 1029–1143). Hoboken: Wiley.
- Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin, 107*, 238–246. doi:[10.1037/0033-2909.107.2.238](https://doi.org/10.1037/0033-2909.107.2.238).
- Bergman, L. R., Magnusson, D., & El-Khoury, B. M. (2003). *Studying individual development in an interindividual context: A person-oriented approach*. Mahwah: Lawrence Erlbaum Associates, Publishers.
- Bollen, K. A. (1989). *Structural equations with latent variables*. New York: Wiley.
- Brockner, J. (1983). Low self-esteem and behavioral plasticity: Some implications. In L. Wheeler & P. R. Shaver (Eds.), *Review of personality and social psychology* (Vol. 4, pp. 237–271). Beverly Hills, CA: Sage.
- Caspi, A., & Roberts, B. W. (1999). Personality change and continuity across the life course. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality theory and research* (Vol. 2, pp. 300–326). New York: Guilford Press.
- Caspi, A., Roberts, B. W., & Shiner, R. L. (2005). Personality development: Stability and change. *Annual Review of Psychology, 56*, 453–484. doi:[10.1146/annurev.psych.55.090902.141913](https://doi.org/10.1146/annurev.psych.55.090902.141913).
- Celeux, G., & Soromenho, G. (1996). An entropy criterion for assessing the number of clusters in a mixture model. *Journal of Classification, 13*, 195–212. doi:[10.1007/BF01246098](https://doi.org/10.1007/BF01246098).
- Charles, S. T., & Carstensen, L. L. (2009). Social and emotional aging. *Annual Review of Psychology, 61*, 383–409. doi:[10.1146/annurev.psych.093008.100448](https://doi.org/10.1146/annurev.psych.093008.100448).
- Collins, L. M., & Lanza, S. T. (2010). *Latent class and latent transition analysis: With applications in the social, behavioral, and health sciences*. New York: Wiley.
- Cummins, R. A., Gullone, E., & Lau, A. L. D. (2002). A model of subjective well being homeostasis: The role of personality. In E. Gullone & R. A. Cummins (Eds.), *The universality of subjective wellbeing indicators: Social indicators research series* (pp. 7–46). Dordrecht: Kluwer. doi:[10.1007/978-94-010-0271-4\\_3](https://doi.org/10.1007/978-94-010-0271-4_3).
- de Lange, A., Taris, T., Kompier, M., Houtman, I., & Bongers, P. (2003). “The very best of the millennium”: Longitudinal research and the Demand-Control-(Support) model. *Journal of Occupational Health Psychology, 8*, 282–305. doi:[10.1037/1076-8998.8.4.282](https://doi.org/10.1037/1076-8998.8.4.282).
- Demerouti, E., Bakker, A. B., Nachreiner, F., & Schaufeli, W. B. (2001). The job demands-resources model of burnout. *Journal of Applied Psychology, 86*, 499–512. doi:[10.1037/0021-9010.86.3.499](https://doi.org/10.1037/0021-9010.86.3.499).
- Feldman, L. A. (1995). Variations in the circumplex structure of mood. *Personality and Social Psychology Bulletin, 21*, 806–817. doi:[10.1177/0146167295218003](https://doi.org/10.1177/0146167295218003).
- Feldt, T., Hyvönen, K., Mäkkikangas, A., Kinnunen, U., & Kokko, K. (2009). Development trajectories of Finnish managers’ work ability over a 10-year follow-up periods. *Scandinavian Journal of Work, Environment & Health, 35*, 37–47. doi:[10.5271/sjweh.1301](https://doi.org/10.5271/sjweh.1301).
- Feldt, T., Kivimäki, M., Rantala, A., & Tolvanen, A. (2004). Sense of coherence and work characteristics: A cross-lagged structural equation model among managers. *Journal of Occupational and Organizational Psychology, 77*, 323–342. doi:[10.1348/0963179041752655](https://doi.org/10.1348/0963179041752655).
- Feldt, T., Leskinen, E., Koskenvuo, M., Suominen, S., Vahtera, J., & Kivimäki, M. (2011). Development of sense of coherence in adulthood: A person-centered approach. The population-based HeSSup cohort study. *Quality of Life Research, 20*, 69–79. doi:[10.1007/s11136-010-9720-7](https://doi.org/10.1007/s11136-010-9720-7).
- Häusser, J. A., Mojzisch, A., Niesel, M., & Schulz-Hardt, S. (2010). Ten years on: A review of recent research on the Job Demand-Control (-Support) model and psychological well-being. *Work & Stress, 24*, 1–35. doi:[10.1080/02678371003683747](https://doi.org/10.1080/02678371003683747).
- Headey, B. W. (2006). *Happiness: revising set point theory and dynamic equilibrium theory to account for long term change*. DIW discussion Paper no. 607. Berlin: DIW.

- Headey, B. W. (2007). *The set-point theory of well-being needs replacing—On the brink of a scientific revolution?* DIW Discussion Paper No. 753. Berlin: DIW.
- Headey, B. W., & Wearing, A. (1989). Personality, life events, and subjective well-being: Toward a dynamic equilibrium model. *Journal of Personality and Social Psychology*, *57*, 731–739. doi:[10.1037/0022-3514.57.4.731](https://doi.org/10.1037/0022-3514.57.4.731).
- Hobfoll, S. E. (1989). Conservation of Resources. A new attempt at conceptualizing stress. *American Psychologist*, *44*, 513–524. doi:[10.1037//0003-066X.44.3.513](https://doi.org/10.1037//0003-066X.44.3.513).
- Isaacowitz, D. M., & Blanchard-Fields, F. (2012). Linking process and outcome in the study of emotion and aging. *Perspectives on Psychological Science*, *7*, 3–16. doi:[10.1177/1745691611424750](https://doi.org/10.1177/1745691611424750).
- Karasek, R. A., & Theorell, T. (1990). *Healthy work: Stress, productivity, and the reconstruction of working life*. New York: Basic Books.
- Kelloway, E. K., & Francis, L. (2013). Longitudinal research and data analysis. In L. E. Tetrick, M. Wang, & R. R. Sinclair (Eds.), *Research methods in occupational health psychology: Measurement, design, and data analysis* (pp. 374–393). New York: Routledge.
- Kinnunen, U., Feldt, T., & Mäkikangas, A. (2008). Testing the effort-reward imbalance model among Finnish managers: The role of perceived organizational support. *Journal of Occupational Health Psychology*, *13*, 114–127. doi:[10.1037/1076-8998.13.2.114](https://doi.org/10.1037/1076-8998.13.2.114).
- Laursen, B., & Hoff, E. (2006). Person-centered and variable-centered approaches to longitudinal data. *Merrill-Palmer Quarterly*, *52*, 377–389. doi:[10.1353/mpq.2006.0029](https://doi.org/10.1353/mpq.2006.0029).
- Lubke, G. H., & Muthén, B. O. (2005). Investigating population heterogeneity with factor mixture models. *Psychological Methods*, *10*, 21–39. doi:[10.1037/1082-989X.10.1.21](https://doi.org/10.1037/1082-989X.10.1.21).
- Mäkikangas, A., Bakker, A. B., Aunola, K., & Demerouti, E. (2010). Job resources and flow at work: Modelling the relationship via latent growth curve and mixture model methodology. *Journal of Occupational and Organizational Psychology*, *83*, 795–814. doi:[10.1348/096317909X476333](https://doi.org/10.1348/096317909X476333).
- Mäkikangas, A., Feldt, T., & Kinnunen, U. (2007). Warr's scale of job-related affective well-being: A longitudinal examination of its structure and relationships with work characteristics. *Work and Stress*, *21*, 197–219. doi:[10.1080/02678370701662151](https://doi.org/10.1080/02678370701662151).
- Mäkikangas, A., Feldt, T., Kinnunen, U., & Mauno, S. (2013). Does personality matter? A review of individual differences in occupational well-being. In A. B. Bakker (Ed.), *Advances in positive organizational psychology—Volume 1* (pp. 107–143). Emerald: Bingley. doi:[10.1108/S2046-410X\(2013\)0000001008](https://doi.org/10.1108/S2046-410X(2013)0000001008).
- Mäkikangas, A., Feldt, T., Kinnunen, U., & Tolvanen, A. (2012). Do low burnout and high work engagement always go hand in hand? Investigation of the energy and identification dimensions in longitudinal data. *Anxiety, Stress & Coping*, *25*, 93–116. doi:[10.1080/10615806.2011.565411](https://doi.org/10.1080/10615806.2011.565411).
- Mäkikangas, A., Hyvönen, K., Leskinen, E., Kinnunen, U., & Feldt, T. (2011). A person-centred approach to investigating the developmental trajectories of job-related affective well-being: A 10-year follow-up. *Journal of Occupational and Organizational Psychology*, *84*, 327–346. doi:[10.1111/j.2044-8325.2011.02025.x](https://doi.org/10.1111/j.2044-8325.2011.02025.x).
- Mäkikangas, A., Kinnunen, U., Feldt, T., & Schaufeli, W. (in press). The longitudinal development of employee well-being: A systematic review. *Work & Stress*.
- Mauno, S., Kinnunen, U., Mäkikangas, A., & Feldt, T. (2010). Job demands and resources as antecedents of work engagement: A qualitative review and directions for future research. In S. Albrecht (Ed.), *The handbook of employee engagement: Perspectives, issues, research and practice* (pp. 111–128). Cheltenham: Edward Elgar and Associates. doi:[10.4337/9781849806374.00016](https://doi.org/10.4337/9781849806374.00016).
- Mauno, S., Ruokolainen, M., & Kinnunen, U. (2013). Does aging make employees more resilient to job stress? Age as a moderator in the job stressor well-being relationship in three Finnish occupational samples. *Aging and Mental Health*, *17*, 411–422. doi:[10.1080/13607863.2012.747077](https://doi.org/10.1080/13607863.2012.747077).
- McCrae, R. R., & Costa, P. T. (2006). *Personality in adulthood. A five-factor theory perspective*. New York: The Guildford Press.
- Muthén, B. O. (2003). Statistical and substantive checking in growth mixture modeling: Comment on Bauer and Curran. *Psychological Methods*, *8*, 369–377. doi:[10.1037/1082-989X.8.3.369](https://doi.org/10.1037/1082-989X.8.3.369).
- Muthén, L. K., & Muthén, B. O. (1998–2010). *Mplus user's guide* (6th edn). Los Angeles: Muthén & Muthén.
- Noblet, A., Rodwell, J., & McWilliams, J. (2001). The job strain model is enough for managers: No augmentation needed. *Journal of Managerial Psychology*, *16*, 635–649. doi:[10.1108/EUM000000000006304](https://doi.org/10.1108/EUM000000000006304).
- Nylund, K. L., Asparouhov, T., & Muthén, B. O. (2007). Deciding on the number of classes in latent class analysis and growth mixture modeling: A Monte Carlo simulation study. *Structural Equation Modeling*, *14*, 535–569. doi:[10.1080/10705510701575396](https://doi.org/10.1080/10705510701575396).

- Ormel, J., & Schaufeli, W. B. (1991). Stability and change in psychological distress and their relationship with self-esteem and locus of control: A dynamic equilibrium model. *Journal of Personality and Social Psychology*, *60*, 288–299. doi:[10.1037//0022-3514.60.2.288](https://doi.org/10.1037//0022-3514.60.2.288).
- Parker, C. P., Baltes, B. B., Young, S. A., Huff, J. W., Altmann, R. A., LaCost, H. A., & Roberts, J. E. (2003). Relationships between psychological climate perceptions and work outcomes: A meta-analytic review. *Journal of Organizational Behavior*, *24*, 389–416. doi:[10.1002/job.198](https://doi.org/10.1002/job.198).
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, *55*, 68–78. doi:[10.1037/0003-066X.55.1.68](https://doi.org/10.1037/0003-066X.55.1.68).
- Scheibe, S., & Zacher, H. (2013). A lifespan perspective on emotion regulation, stress, and well-being in the workplace. In P. L. Perrewé, C. C. Rosen, & J. Halbesleben (Eds.), *The role of emotion and emotion regulation in job stress and well-being* (pp. 163–194). Bingley: Emerald Group Publishing.
- Schermelleh-Engel, K., Moosbrugger, H., & Müller, H. (2003). Evaluating the fit of structural equation models: Tests of significance and descriptive goodness-of-fit measures. *Methods of Psychological Research Online*, *8*, 23–74.
- Spector, T. E. (1998). A control theory of the job stress process. In C. L. Cooper (Ed.), *Theories of organizational stress* (pp. 153–169). Oxford: Oxford University Press.
- Staudinger, U., & Kunzmann, U. (2005). Positive adult personality development. Adjustment and/or growth? *European Psychologist*, *10*, 320–329. doi:[10.1027/1016-9040.10.4.320](https://doi.org/10.1027/1016-9040.10.4.320).
- Steiger, J. H. (1990). Structural model evaluation and modification: An interval estimation approach. *Multivariate Behavioral Research*, *25*, 173–180. doi:[10.1207/s15327906mbr2502\\_4](https://doi.org/10.1207/s15327906mbr2502_4).
- Strauss, K., & Parker, S. K. (2014). Effective and sustained proactivity in the workplace: A self-determination theory perspective. In M. Gagné (Ed.), *The Oxford handbook of work engagement, motivation, and self-determination theory* (pp. 50–71). Oxford: Oxford University Press.
- Tucker, L. R., & Lewis, C. (1973). A reliability coefficients for maximum likelihood factor analysis. *Psychometrika*, *38*, 1–10. doi:[10.1007/BF02291170](https://doi.org/10.1007/BF02291170).
- van der Doef, M., & Maes, S. (1999). The Job Demand-Control (-Support) model and psychological well-being: A review of 20 years of empirical research. *Work & Stress*, *13*, 87–114. doi:[10.1080/026783799296084](https://doi.org/10.1080/026783799296084).
- Wang, M., & Zhou, L. (2013). Latent class procedures: Recent development and applications. In J. M. Corina & R. S. Landis (Eds.), *Modern research methods for the study of behavior in organizations* (pp. 137–160). New York: Routledge.
- Warr, P. (1990). The measurement of well-being and other aspects of mental health. *Journal of Occupational Psychology*, *63*, 193–210. doi:[10.1111/j.2044-8325.1990.tb00521.x](https://doi.org/10.1111/j.2044-8325.1990.tb00521.x).
- Warr, P. (1994). A conceptual framework for the study of work and mental health. *Work & Stress*, *8*, 84–97. doi:[10.1080/02678379408259982](https://doi.org/10.1080/02678379408259982).
- Watson, D., & Tellegen, A. (1985). Toward a consensual structure of mood. *Psychological Bulletin*, *98*, 219–235. doi:[10.1037//0033-2909.98.2.219](https://doi.org/10.1037//0033-2909.98.2.219).
- Wu, C.-H., & Griffin, M. A. (2012). Longitudinal relationships between core self-evaluations and job satisfaction. *Journal of Applied Psychology*, *97*, 331–342. doi:[10.1037/a0025673](https://doi.org/10.1037/a0025673).