Work-related learning in the transition from higher education to work: The role of the development of self-efficacy and achievement goals

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Background. Work-related learning is particularly important at the start of graduates' careers. Preparing students for work-related learning is a chief aim of higher education, demonstrating its relevance when investigating the transition to work.

Aim. This study aimed to investigate the role of personal factors for work-related learning during the transition from higher education to work. This study took a longitudinal and person-centred approach by examining differences in work-related learning between different motivational profiles based on the conjoint development of self-efficacy and achievement goals.

Sample. Questionnaires were administered four times, starting in the beginning of students' final year of higher education until 4 months after graduation ($N = 814$).

Methods. In order to assess the development of the personal factors, different multi-indicator latent growth curve models were estimated. Afterwards, a multidimensional latent class growth analysis was used to identify latent profiles of participants with similar growth trajectories. Differences in work-related learning were investigated by a multivariate analysis of variance.

Results and Conclusions. The results revealed an average increase in self-efficacy, learning-goal, and performance-approach orientation, indicating that the transition to work triggers change in these personal factors. Performance-avoidance orientation decreased on average. Four distinct motivational profiles were discerned: strongly efficacious and approach-oriented, moderate efficacious and approach-oriented, moderate efficacious and learning-oriented, and undecided profile. Furthermore, differences were found concerning work-related learning, in which the strongly efficacious and approach-oriented profile reported more participation in formal and informal learning activities using personal sources, while the undecided profile showed least participation in the latter.

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The transition from higher education to work is an important period in the life of young adults (Koen, Klehe, & Van Vianen, 2012). Their entrance into a new context brings its own challenges (Le Maistre & Paré, 2004). Consequently, early-career employees are expected to develop new competences and deepen their current competences (Abbrandt Dahlgren, Hult, Dahlgren, Hård af Segerstad, & Johansson, 2006). This can be achieved through work-related learning, being employees' engagement in learning activities that leads to the improvement of their competences (Kyndt & Baert, 2013). As work-related learning is especially important for early-career employees (Brooks & Everett, 2008), the present study investigates work-related learning during the challenging period of the transition from education to work.

While many challenges in this transition are clearly situated in the period after graduation (e.g., finding employment, adapting to the new context), students are already preparing themselves for the transition to work during higher education (Grosemans, Coertjens, & Kyndt, 2017; Koen *et al.*, 2012; Nicholson, 1990). Analogously, preparing students for work-related learning is a main aim for higher education (e.g., Endedijk & Vermunt, 2013). Therefore, and in contrast to the majority of the existing studies on the transition from higher education to work, the current study approaches this transition as a dynamic period, spanning the period of higher education, the actual finding of a job, and the adjustment to this new environment (Grosemans *et al.*, 2017). More concretely, this study aims to get more insight into the transition to work by taking a dynamic approach and investigating how the development of personal factors within higher education contributes to work-related learning of early-career employees.

Theoretical background

Personal factors and work-related learning

Work-related learning is defined by Kyndt and Baert (2013) as 'the engagement in formal and informal learning activities both on and off the job, whereby employees and groups of employees acquire and/or improve competences that change individuals' present and future professional achievement and organisational performance' (p. 275). This definition approaches work-related learning in an integrative way, emphasizing both formal and informal learning activities. *Formal learning activities* are those activities that are more strictly organized, often within a fixed and limited time span, such as trainings (Eraut, 2000). *Informal learning activities* are typically activities that follow from working (Lohman, 2006). These activities are generally less restricted concerning learning time or objectives, such as discussing with colleagues or reflection (Noe & Wilk, 1993). Work-related learning is demonstrated to be particularly important for graduates embarking on their career, as the entrance to their new job comes along with many challenges that can trigger work-related learning (Brooks & Everett, 2008). While work-related learning of employees is a commonly investigated topic, little is known about work-related learning in the case of early-career employees (Hurtz & Williams, 2009). More specifically, Kyndt and Baert (2013) identified numerous antecedents of work-related learning in general, but the question remains as to how factors in higher education can prepare students for future work-related learning.

When focusing on antecedents of work-related learning within the transition from higher education to work, *personal factors* are particularly interesting. These factors can be transferred across contexts, in contrast to those factors inherently tied to contexts of either school or work. Self-efficacy and achievement goals are demonstrated to be

important personal factors for work-related learning: They are both related to how individuals regard, evaluate, and define their competence, and these perceptions have been found to predict performance and the capacity of learning new competences (Bandura, 1997; Noe & Wilk, 1993; Pajares, 1996; van Dinther, Dochy, & Segers, 2011).

Starting from the premise that personal factors can be transferred across contexts, it is important to note that self-efficacy and achievement goals are considered to be changing states (Fryer & Elliot, 2007). Change can be triggered when individuals need to regulate their goals, which is apparent in transition processes due to the entrance to a new environment (Haase, Heckhausen, & Köller, 2008). Although prior research devoted limited attention to the development of these personal factors in the context of the transition to work, their development in other transition processes was demonstrated (Anderman & Midgley, 2004; Friedel, Cortina, Turner, & Midgley, 2010). Combining that change in those personal factors is expected under changing circumstances and their importance for work-related learning, it is crucial to consider the development of self-efficacy and achievement goals during higher education when investigating these personal factors as predictors of work-related learning of early-career employees.

Achievement goals in the transition to work

The goal orientation framework of Elliot and McGregor (2001) is particularly relevant to the transition from education to work: Nurmi, Salmela-Aro, and Koivisto (2002) demonstrated that goal-setting and achievement of those goals are crucial during the transition to work. The different achievement goals were found to influence the career aspirations of young adults (Creed, Tilbury, Buys, & Crawford, 2011). In addition, this framework has proven its value in both the educational and the workplace context (Kyndt, Donche, Gijbels, & Van Petegem, 2014), which facilitates the examination of development of achievement goals in the transition to this new context.

The three orientations that are most frequently studied and are taken into account in this study are: learning-goal orientation, performance-approach orientation, and performance-avoidance orientation. Students with a high *learning-goal orientation* are focused on developing competences and performing tasks in order to learn new things (Elliot & McGregor, 2001). Students with a high *performance-approach orientation* are mainly directed towards demonstrating their competences and/or comparing them with those of others (Elliot & McGregor, 2001). Lastly, students with a high *performance-avoidance orientation* are trying to avoid tasks when they expect the consequences to be negative. In addition, it has been demonstrated that the different goal orientations can exist simultaneously (Pintrich, Conley, & Kempler, 2003). Barron and Harackiewicz (2001) argued that, when adopting a *multiple goal perspective*, the combination of goals can optimize results. Although this perspective was frequently criticized, empirical evidence for most criticisms is lacking (Senko, Hulleman, & Harackiewicz, 2011). Consequently, a multiple goal perspective provides the opportunity to get a deeper insight into how the different achievement goals and their interaction relate to proposed outcomes.

Prior research examined change in achievement goals in education (e.g., Shim, Ryan, & Anderson, 2008). Fryer and Elliot (2007) demonstrated that approach orientations (both learning and performance) decreased over time, while performance-avoidance orientation slightly increased over time. This finding was partly confirmed by Shim *et al.* (2008), who found a decline in all three achievement goals over the course of 1 year in middle school. Corker, Donnellan, and Bowles (2013) investigated students during their entire period in college and found a decline in learning-goal orientation and avoidance-approach

orientation, whereas performance-approach orientation remained stable. Lee, Wormington, Linnenbrink-Garcia, and Roseth (2017) demonstrated relative stability when investigating the different achievement goals in university students.

Concerning its effects on work-related learning, having a learning-goal orientation was shown to have a positive effect on participation in work-related learning activities (Hurtz & Williams, 2009; Noe & Wilk, 1993). To the best of our knowledge, the effects of performance-approach and performance-avoidance orientation on work-related learning have not been examined yet. In general, however, a performance-avoidance orientation is related to more negative outcomes, while a learning-goal orientation and a performance-approach orientation are typically associated with more positive outcomes (Creed *et al.*, 2011).

Self-efficacy in the transition to work

Self-efficacy refers to the 'belief in one's own capabilities to organize and execute the courses of action required to produce given attainments' (Bandura, 1997, p. 3). Self-efficacy is critical to increase preparedness for the transition to work (Akkermans, Nykänen, & Vuori, 2015). It has been argued that a higher self-efficacy during education can be related to positive career-related outcomes (Akkermans *et al.*, 2015; Bandura, 1997). On a more general level, self-efficacy has also been related to perseverance in taxing situations (Pajares, 1996), such as the transition from a familiar context to a new one. Research investigating the development of self-efficacy beliefs during (higher) education is scarce and does not provide a clear pattern. Although it is assumed that self-efficacy decreases during (higher) education, in line with the development pattern of the approach orientations (Friedel *et al.*, 2010), Gerhardt and Brown (2006) found a general increase in self-efficacy during university.

As to the role self-efficacy plays vis-à-vis work-related learning in general, previous research has confirmed its positive effect on work-related learning (Kyndt & Baert, 2013). However, while the positive effect of self-efficacy on formal learning was confirmed (Maurer, Weiss, & Barbeite, 2003; Noe & Wilk, 1993), no univocal results were found concerning informal learning. Whereas the study by Maurer *et al.* (2003) found no effect, a study of Schulz and Roßnagel (2010) confirmed the positive effect of self-efficacy on informal work-related learning for employees with diversified experience.

The interaction between achievement goals and self-efficacy

As stated earlier, self-efficacy and achievement goals are both important during the transition to work. It should be taken into account that they are closely related, since they are both focused on how students regard and define their own capabilities (Pajares, 1996). Despite their relatedness, they should be viewed as distinct constructs: While achievement goals are considered to be related to how individuals define their capability, self-efficacy is an estimation of the level of perceived capability (Bjørnebekk, Diseth, & Ulriksen, 2013). Their relatedness has frequently been investigated and was summarized in a meta-analysis: The correlation between self-efficacy and learning-goal orientation was moderate to strong, and the correlation between self-efficacy and performance-approach was low (Huang, 2016). Moreover, self-efficacy did not correlate with performance-avoidance orientation (Huang, 2016). Whereas the meta-analysis focused on cross-sectional correlations, the study of Gerhardt and Brown (2006) focused on the development of self-efficacy in university and found that achievement goals influence

the development of self-efficacy. Hence, the findings from the meta-analysis and this longitudinal study emphasize the need to examine the interaction between the different goal orientations and self-efficacy (Gerhardt & Brown, 2006; Huang, 2016).

Present study

The current study aims to investigate how the development of personal factors within higher education relates to work-related learning of early-career employees and, subsequently, to provide a first step in advancing theory on the transition to work. More specifically, it investigates the relation between the simultaneous development of achievement goals and self-efficacy and work-related learning beyond graduation. To achieve this goal, three research questions are proposed.

First, this study acknowledges the dynamic character of transitions by taking the development of achievement goals and self-efficacy during the transition to work into account. As it is expected that transitional processes can trigger change in personal factors, these developments are investigated. The first research question reads as follows:

RQ1: How do self-efficacy and achievement goals develop during the transition from higher education to work?

Second, the current study will account for the variance that exists at the individual level by taking a person-centred approach (Laursen & Hoff, 2006). Fryer and Elliot (2007) pointed towards differential trajectories in achievement goals, which will be taken into account. Moreover, the interaction between the variables will be captured by identifying different profiles (Wormington & Linnenbrink-Garcia, 2017). *Motivational profiles* will be discerned based on the simultaneous development of the achievement goals and self-efficacy. Therefore, the second research question is:

RQ2: Which different profiles can be found, based on the conjoint development of self-efficacy and achievement goals?

Taking motivational profiles into account makes it possible to approach the transition as a process (longitudinal approach) and to capture differences between individuals (person-centred approach). By relating these profiles to work-related learning, this study can take the specific character of the transition to work into account when examining the role of self-efficacy and achievement goals in work-related learning. Moreover, unlike previous studies (Hurtz & Williams, 2009) this study contributes to research on work-related learning by including a broad range of learning activities. As such, the final research question reads as follows:

RQ3: Do the identified motivational profiles differ in their level of participation in work-related learning?

Method

Design

A questionnaire was administered to final-year students across different disciplines at six higher education institutions in Belgium (one university and five university colleges). Students were invited to participate in the longitudinal research project in November 2015 (approximately 1 month after the start of their final year). The second wave of data collection was organized in February 2016 (at the start of the second semester of their final

year), followed by a third wave in July 2016, at the time of graduation. The fourth measurement was taken in November 2016, approximately 4 months after graduation.

The students were initially contacted via an email sent by their educational institution at the first, second, and third wave. From the first wave onwards, students were asked to provide contact details. These students were contacted directly in the second, third, and fourth wave. Every student with contact information was contacted at each wave, even those students who did not participate in all previous waves of data collection. In order to motivate students to participate in the study, a gift voucher was raffled off among the participants during each wave.

Participants

Across the four waves of data collection, 4,421 students participated in at least one wave of the research project. This study focuses on early-career employees, implying that it was important to have details on the employment status of the participants 4 months after graduation. At the fourth wave of data collection (4 months after graduation), 1,479 participants indicated whether they were working, seeking a job, or had continued studying. Only participants who were employed were included in the analyses ($N = 814$). The majority of participants were female (female: 75.43%; male: 24.57%). The mean age of the participants was 24.58 years ($SD = 4.66$).

Because only participants who had found work prior to the fourth wave of data collection were included, a backward selection of the sample was made: We started from the 814 participants who were employed and included their data of the four waves in all analyses. Therefore, the sample sizes (of included participants) at the first three waves are lower than at the fourth wave: In total, the first questionnaire was completed by 540 participants, the second by 557; and the third by 554. Complete data (i.e., participation across the four waves) were collected on 347 out of the 814 participants (42.63%). Furthermore, 205 participants completed the questionnaire three times (25.18%); 200 participated twice (24.57%); and 62 participated once (7.62%).¹

Data were not missing completely at random (MCAR) according to Little's MCAR test (Little's MCAR test: $\chi^2(97) = 139.40$; $p = .003$). Previous research has shown that relying solely on participants with complete data provides less accurate estimates compared to including missing data using the full information maximum likelihood estimation, especially when data are not MCAR (Allison, 2003; Enders & Bandalos, 2001). Therefore, data of all 814 participants were integrally included in the analyses, using the full information maximum likelihood estimator.

Instruments

To measure achievement goals, the scale of Kyndt *et al.* (2014) was used, consisting of 16 items: eight items measured learning-goal orientation, four measured performance-approach orientation, and four measured performance-avoidance orientation. To measure self-efficacy, the 8-item scale of Chen, Gully, and Eden (2001) was translated into Dutch. At the fourth wave of data collection, both instruments were adjusted to the

¹ In line with recommendations in methodological literature (e.g., Allison, 2003; Wothke, 2000), we opted to include all participants in the analyses, also the 62 participants who only completed the questionnaire at the fourth wave of data collection. However, the identification of profiles was repeated excluding these participants. This provided similar results, which are provided in Appendix B.

work context (e.g., 'students' was replaced by 'colleagues'). All items were measured on a 7-point Likert scale ranging from 1 ('Completely disagree') to 7 ('Completely agree'). Finally, participation in work-related learning activities was measured at the fourth wave of data collection (when graduates were employed) by the 13-item scale of Grosemans, Smet, Houben, De Cuyper, and Kyndt (2018) measuring participation in formal learning activities (e.g., trainings, seminars; four items), informal learning activities using personal sources (e.g., reflecting on tasks, discussing with colleagues; six items), and informal learning activities using environmental sources (e.g., watching visual materials, searching for information; three items). The items measured frequency of participation in different learning activities on a 7-point Likert scale ranging from 1 ('Never') to 7 ('On a daily basis'). Sample items and descriptive statistics are provided in Table 1.

Analyses

Preliminary analyses

First, it was assessed whether the structure of the instruments could be confirmed by means of confirmatory factor analyses (CFA) using maximum likelihood robust (MLR) estimation. Model fit was assessed by three indices: Comparative Fit Index (CFI), Tucker–Lewis Index (TLI), and Root Mean Square Error of Approximation (RMSEA). Two items of the scale of learning-goal orientation were removed due to low loadings (six items remained). Afterwards, the models showed an appropriate fit at each wave, as shown in Table 2. The work-related learning instrument ($N = 780$) at the fourth wave also showed a good fit (CFI = .95, TLI = .93, RMSEA = .06; $\chi^2(62) = 230.95$).

Subsequently, longitudinal measurement invariance (LMI) was checked (Coertjens, Donche, De Maeyer, Vanthournout, & Van Petegem, 2012). Configural invariance and metric invariance were achieved for all scales (see Appendix A). In order to achieve scalar invariance, one intercept of self-efficacy and one intercept of learning-goal orientation, respectively, were freed. For performance-approach orientation, two intercepts were freely estimated. Due to this partial LMI for those three scales, the intercept variances were modelled in the subsequent analyses (Coertjens *et al.*, 2012).

Investigating the development of self-efficacy and achievement goals

In order to examine the development trajectories of self-efficacy and achievement goals, its change was examined. Multi-indicator latent growth curve models with initial levels (i.e., intercepts) and slopes as latent constructs were used. Three models were estimated for each scale: a linear model, a quadratic model, and a free time scores model. As the data were gathered at unequal time intervals, unequal time scores were used to estimate the model. For the free time scores model, the two middle scores were freely estimated (Coertjens, Donche, De Maeyer, van Daal, & Van Petegem, 2017). To examine which model fitted the data best, the Akaike information criterion (AIC) and Bayesian information criterion (BIC) were used as well as a model comparison based on the chi-square test with Satorra–Bentler scaling (Muthén & Muthén, 2015; Satorra & Bentler, 2010).

Identifying latent growth profiles

The second research question concerned the estimation of latent profiles based on participants' growth trajectories of self-efficacy and achievement goals. Therefore, the different growth trajectories of the variables were combined in a multi-indicator parallel

Table 2. Model fit of the confirmatory factor analyses at each wave

Wave	CFI	TLI	RMSEA – 90% CI	χ^2 (df)
Wave 1	.92	.91	.053 (0.047; 0.059)	508.88 (203)
Wave 2	.93	.92	.051 (0.046; 0.057)	501.75 (203)
Wave 3	.92	.91	.056 (0.050; .0062)	555.51 (203)
Wave 4	.94	.93	.051 (0.046; 0.055)	627.57 (203)

process growth curve model (Wickrama, Lee, O’Neal, & Lorenz, 2016). Afterwards, a multidimensional latent class growth analysis (LCGA) was used to identify latent profiles of participants with similar growth trajectories for both self-efficacy and achievement goals (Jung & Wickrama, 2008). Different models (one to six profiles) were compared. The comparison of the models was guided by their BIC in which smaller values indicate better model fit (Grimm, Ram, & Estabrook, 2016), the Vuong–Lo–Mendell–Rubin likelihood ratio test (LMR) and the bootstrap likelihood ratio test (BLRT), being reliable tests for making a decision on the number of profiles (Nylund, Asparouhov, & Muthen, 2007). Furthermore, in order to decide on the final model the entropy was taken into account (Jung & Wickrama, 2008).

Examining differences in work-related learning

Lastly, we checked whether these profiles identified differed in their (level of) participation in work-related learning activities. Therefore, a multivariate analysis of variance (MANOVA) was conducted using Pillai’s trace test statistic, which is a positive-valued statistic. Pillai’s trace was selected, because of its robustness to model violations (Olson, 1976).

The MANOVA was performed using SPSS software (version 24); all other analyses were conducted using Mplus software (version 7.1.4).²

Results

Development of self-efficacy and achievement goals

Self-efficacy

Both the linear and the quadratic latent growth models revealed a good fit. However, the estimate of the quadratic term was not significant ($q = -.01$, $SE = .08$, $p = .905$), indicating that this was not the best model for capturing the data. The free time scores model was not significantly better than the linear model based on the AIC, the BIC, and the chi-square test, $\Delta\chi^2(2) = 2.29$, $p = .360$. As the most parsimonious model is generally preferred (Jacobucci, 2009), it was concluded that the *linear model* fitted the data best. This model indicated that students’ self-efficacy on average followed a linear increasing trend during the final year and the transition to work (see Table 3). The loglikelihood ratio chi-squared test with Satorra–Bentler correction indicated the significance of the variance of the slope, demonstrating that students differed in their growth over time. Furthermore,

² The Mplus syntax files and corresponding dataset are available via https://osf.io/b253h/?view_only=c900e9317a234b40ade1902c369aaa84

Table 3. Intercepts and slopes of the selected growth models

	Intercept			Slope				
	Mean Estimate	Variance		Mean Estimate (SE)	Variance		Covariance	
		Estimate (SE)	$\Delta \chi^2$ (df)		Estimate (SE)	$\Delta \chi^2$ (df)	Estimate (SE)	$\Delta \chi^2$ (df)
Self-efficacy								
Linear	0	0.262 (0.032)	214.34 (2); $p < .001$	0.212*** (0.024)	0.083 (0.036)	29.74 (2); $p < .001$	-0.100 (0.024)	27.06 (1); $p < .001$
Learning-goal orientation								
Linear	0	0.436 (0.045)	198.69 (2); $p < .001$	0.246*** (0.032)	0.185 (0.058)	40.17 (2); $p < .001$	-0.172 (0.037)	68.89 (1); $p < .001$
Performance-approach orientation								
Free time scores	0	0.563 (0.063)	157.68 (2); $p < .001$	0.938*** (0.056)	0	-	0	-
Performance-avoidance orientation								
Linear	0	0.844 (0.078)	275.30 (2); $p < .001$	-0.133** (0.044)	0.322 (0.115)	9.45 (2); $p = .009$	-0.139 (0.070)	4.11 (1); $p = .043$

Notes. The mean of the intercept is fixed to zero in latent growth curve models in which the measurement model is taken into account (Muthén & Muthén, 2015). ** $p < .01$; *** $p < .001$.

the covariance between intercept and slope was significant and negative, demonstrating that a higher increase is found for students with a lower starting point of self-efficacy.

Learning-goal orientation

The *linear model* was selected as optimal model, based on the chi-square test, compared to quadratic: $\Delta\chi^2(1) = 3.32$, $p = .068$; compared to free times scores: $\Delta\chi^2(2) = 5.35$, $p = .069$, and the BIC values. Based on the significant slope, it was concluded that students on average follow a positive linear trend in learning-goal orientation. The variance of the slope was also significant, providing evidence for differential growth. Moreover, the covariance was significant and negative, indicating that students with a lower starting point of learning-goal orientation experienced a higher increase during (preparation for) the transition to work.

Performance-approach orientation

Whereas the linear model showed a good fit, the quadratic model fitted the data better, $\Delta\chi^2(2) = 126.34$, $p < .001$. Due to a negative (but insignificant) residual variance of the latent factor at the fourth wave, the variance of the slope was fixed to zero in order to correctly estimate the free time scores model, based on the suggestion of Muthén (2007). Consequently, the quadratic and free times scores model have equal degrees of freedom, implying that these models could not be compared. However, based on the fit indices and BIC value, the *free time scores model* was selected as best model for performance-approach orientation. The results showed that no significant increase could be found for the first semester of the final year of higher education. Additionally, no change occurred during the second semester. The largest increase (95% of the total increase) occurred after graduation. As the variance of the slope had to be fixed to zero, the slope variance and covariance could not be examined.

Performance-avoidance orientation

The linear, quadratic, and free time scores models yielded a good fit. However, the estimate of the quadratic term was not significant ($q = .14$, $SE = .15$, $p = .344$). The free time scores model did not provide a better fit than the linear model based on the fit indices and the non-significant chi-square test ($\Delta\chi^2(2) = 2.03$, $p = .363$). Hence, the *linear model* was selected as best model for performance-avoidance orientation. Based on the negative and significant slope, it was concluded that performance-avoidance orientation on average decreases during the students' final year of higher education until the first 4 months after graduation. Furthermore, the variance of the slope was significant, demonstrating that students differed concerning their growth trajectory. The covariance between intercept and slope was negative and significant, indicating that students with a lower starting point experienced a higher increase in performance-avoidance orientation.

Identification of different latent growth profiles

First, a parallel process growth curve model was estimated, based on the selected growth trajectories per variable. In this model, the variance of the slope of learning-goal orientation showed a small negative but insignificant residual variance and was therefore fixed to zero. The fit of this model was appropriate (CFI = .90, TLI = .90, RMSEA = .03)

Table 4. Goodness of fit for the different models

Number of profiles	BIC	Entropy	LMR	
			Value (Δ parameters)	p
1	139060.78	—	—	—
2	137811.42	.746	−68572.01 (9)	<.001
3	137260.44	.778	−67917.17 (9)	.036
4	136845.79	.788	−67611.52 (9)	.034
5	136678.92	.771	−67374.04 (9)	.677
6	136511.04	.786	−67268.07 (9)	.257

and was used as a starting point for the multidimensional latent class growth model (LCGA).

Second, LCGAs (with one to six profiles) were estimated. According to the BIC values, model fit improvements could be observed for up to six profiles, although according to the LMR test the four-profile model fitted the data best (see Table 4). Moreover, the BLRT comparing the four-profile model with the three-profile model indicated that the four-profile model was preferred ($p < .001$). As the entropy of the four-profile model was acceptable ($>.60$; Wickrama *et al.*, 2016), this model was selected as the final model.

The growth trajectories of all profiles are depicted in Figure 1, and the parameters are shown in Table 5. Generally, it can be concluded that the main differences between the profiles can be found in the starting values, while the differences in the slopes are limited. Concerning the slopes, all four profiles demonstrate the growth patterns that were found earlier for self-efficacy and performance-approach

Profile 1: Strongly efficacious and approach-oriented

Profile 2: Moderate efficacious and approach-oriented

Profile 3: Moderate efficacious and learning-oriented

Profile 4: Undecided motivational orientation

—x— Self-efficacy —■— Learning-goal orientation —▲— Performance-approach orientation —◆— Performance-avoidance orientation

Figure 1. Growth trajectories for multidimensional latent profiles.

Table 5. Results of the final LCGA with four latent profiles

Growth parameters (95% CI)	Profile 1 (N = 143)	Profile 2 (N = 339)	Profile 3 (N = 194)	Profile 4 (N = 138)
Self-efficacy				
Intercept	1.268*** (1.062; 1.474)	0.685*** (0.518; 0.853)	0.658*** (0.453; 0.863)	0.000
Slope	0.112* (0.018; 0.206)	0.249*** (0.155; 0.343)	0.181*** (0.083; 0.278)	0.254** (0.095; 0.412)
Learning-goal orientation				
Intercept	1.415*** (1.180; 1.650)	0.608*** (0.370; 0.847)	0.753*** (0.446; 1.060)	0.000
Slope	0.218*** (0.105; 0.331)	0.340*** (0.212; 0.468)	0.125 (−0.064; 0.313)	0.197 (−0.023; 0.417)
Performance-approach orientation				
Intercept	0.556** (0.157; 0.954)	0.613*** (0.282; 0.944)	−0.725** (−1.201; −0.247)	0.000
Slope	0.875*** (0.656; 1.094)	0.844*** (0.717; 0.971)	0.974*** (0.771; 1.178)	0.910*** (0.716; 1.104)
Performance-avoidance orientation				
Intercept	−1.595*** (−2.002; −1.188)	−0.127 (−0.596; 0.342)	−1.482*** (−1.867; −1.097)	0.000
Slope	−0.286** (−0.494; −0.079)	−0.217*** (−0.376; −0.059)	−0.071 (−0.264; 0.121)	0.095 (−0.138; 0.328)

Notes. In a LCGA, the intercepts of the last profile are fixed to zero.

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

Table 6. Means of work-related learning activities for motivational profiles

	Profile 1 (N = 137; 17.56%)	Profile 2 (N = 324; 41.54%)	Profile 3 (N = 189; 24.23%)	Profile 4 (N = 130; 16.67%)
Formal learning				
M (SD)	2.66 (1.18)	2.36 (1.08) ^a	2.40 (0.98)	2.34 (1.10)
Informal learning – personal sources				
M (SD)	5.34 (1.14)	4.99 (1.17) ^a	5.23 (1.03)	4.88 (0.99) ^{b,c}
Informal learning – environmental sources				
M (SD)	4.49 (1.56)	4.11 (1.46)	4.22 (1.42)	4.05 (1.54)

Notes. ^aProfile 2 significantly different from profile 1.

^bProfile 4 significantly different from profile 3.

^cProfile 4 significantly different from profile 1.

orientation (i.e., linear increase). Limited differences in slopes are found for learning-goal orientation and performance-avoidance orientation. When focusing on the profiles separately, the first is referred to as the '*strongly efficacious and approach-oriented profile*', because students in this profile are characterized by high starting values on both performance-approach orientation and learning-goal orientation. This is coupled with high starting values of self-efficacy. Furthermore, these students show a significant increase in performance-approach orientation, learning-goal orientation, and self-efficacy during their final year and the transition. Simultaneously, they show a low initial value of performance-avoidance orientation and a significant decreasing trend for the latter.

Students in the second profile experience a similar growth trajectory as students in the first profile (i.e., no differences in the slope estimates were found compared to the first profile). However, they differ from students in the first profile in their lower starting values for self-efficacy and learning-goal orientation, and higher starting values for performance-avoidance orientation. Therefore, this profile is named the '*moderate efficacious and approach-oriented profile*'.

In contrast to the growth patterns in the first two profiles, the third profile and fourth profile are both characterized by a stable learning-goal orientation and performance-avoidance orientation. The third profile is referred to as the '*moderate efficacious and learning-oriented profile*', as moderate starting values of learning-goal orientation and self-efficacy can be found, with significant increasing self-efficacy during the transition. Furthermore, students in this profile showed low starting values of both performance-approach and performance-avoidance orientation. However, their performance-approach orientation increased significantly during the transition.

The last profile is labelled the '*undecided motivational profile*', as students in this profile show a constantly low learning-goal orientation and a constantly high performance-avoidance orientation. On top of this, moderate but significant increasing values for performance-approach orientation are found in combination with low but significant increasing values for self-efficacy.

Differences in work-related learning

To investigate whether the participation in work-related learning activities differed for the four identified profiles (based on profile membership as a result of the LCGA), a MANOVA

was performed. The results showed significant differences between the motivational profiles using Pillai's trace, $V = .03$, $F(9, 774) = 2.56$, $p = .006$. The follow-up univariate analyses of variance (ANOVAs) revealed significant albeit small effects for formal learning activities, $F(3, 776) = 2.80$, $p = .039$, $\eta^2 = .01$, and for informal learning activities using personal sources, $F(3, 776) = 5.72$, $p = .001$, $\eta^2 = .02$. The ANOVA for informal learning activities using environmental sources tended to demonstrated differences, although the p -value was slightly above the alpha level, $F(3, 776) = 2.56$, $p = .054$, $\eta^2 = .01$. A Bonferroni post-hoc test was conducted to investigate the differences between the profiles (see Table 6). The '*strongly efficacious and approach-oriented profile*' reported significantly more formal learning activities and informal learning activities using personal sources than the '*moderate efficacious and approach-oriented profile*' and more informal learning activities using personal sources than the '*undecided motivational profile*'. Furthermore, early-career employees in this '*undecided profile*' showed less informal learning activities using personal sources than those in the '*moderate efficacious and learning-oriented profile*'.

Conclusion and discussion

The present study investigated the role of self-efficacy and achievement goals in work-related learning of early-career employees with specific attention to the dynamic character of the transition to work. Although achievement goals are frequently investigated as stable constructs in the transition to work (Tuominen-Soini, Salmela-Aro, & Niemivirta, 2011), in this study both self-efficacy and learning-goal orientation increased on average. Concerning learning-goal orientation, this is surprising when compared to general tendencies in education: Prior research investigating the development of learning-goal orientation demonstrated that in general, it decreased or remained stable (Corker *et al.*, 2013; Fryer & Elliot, 2007; Shim *et al.*, 2008). Consequently, these results contribute to research on achievement goals by taking the final year of higher education and the first months at work into account. The results suggested that, in contrast to general development, the preparation for the transition to work triggers change in self-efficacy and learning-goal orientation. For performance-avoidance orientation, in line with prior research (Shim *et al.*, 2008), a decrease was found during the preparation for the transition to work and the first months at work.

For performance-approach orientation, a free time scores model was retained, in which 95% of the change occurred between graduation and 4 months after graduation, in the period when most graduates started their employment. This implies that performance-approach orientation remained stable during the final year of higher education, in line with prior research (Corker *et al.*, 2013). Hence, change was triggered due to the switch in context, with performance-approach orientation gaining importance in the working context. Prior research on other transitions (e.g., from secondary to higher education) has indeed shown that performance-approach orientation played a more prominent role compared to learning-goal orientation (Barron & Harackiewicz, 2001). An additional explanation for this phenomenon is that early-career employees are frequently concerned with making a good impression and, to this end, aim to demonstrate their competences (e.g., Le Maistre & Paré, 2004). Moreover, higher education graduates are confronted with a competitive job market and their jobs are often oriented towards performance rather than towards learning (e.g., Tomlinson, 2012), which could explain the relative importance of performance-approach orientation in this specific transition process.

The second research question entailed the identification of latent profiles based on the growth trajectories of self-efficacy and achievement goals. Four distinct motivational profiles were detected, indicating that individuals vary in their development in these personal factors during (preparation for) the transition to work (Creed *et al.*, 2011). The results demonstrated that profiles differ in the degree to which they endorse the different aspects of the motivational profiles: Whereas, for example, the '*strongly efficacious and approach-oriented profile*' clearly reported high scores on both learning-goal and performance-approach orientation, the '*moderate efficacious and learning-oriented profile*' also reported high values on learning-goal orientation, but rather low values on performance-approach orientation. True differences between the motivational profiles were mainly found in the starting values (i.e., values at the start of the final year of higher education). As such, students' achievement goals and self-efficacy established in higher education play an important role in their subsequent transition process, underpinning the theory that preparation is crucial in transition processes (Nicholson, 1990). Accordingly, it would be interesting to investigate how higher education could foster self-efficacy and achievement goals in students in the process of moving towards work (Pintrich *et al.*, 2003).

Concerning the third research question, differences were found in participation in work-related learning activities between the profiles. Lowest levels of participation in informal learning using personal sources were found for the '*undecided motivational model*'. Graduates in the latter profile reported significantly lower levels than the '*moderate efficacious and learning-oriented profile*', suggesting that especially learning-goal orientation and self-efficacy are important for work-related learning, in line with prior research (Kyndt & Baert, 2013). The '*strongly efficacious and approach-oriented profile*' showed most participation in work-related learning. This result is in favour of the *interactive goal effect*, implying that the combination of approach orientations enhances a positive outcome (Barron & Harackiewicz, 2001): Most work-related learning takes place when high levels of learning-goal and performance-approach orientation are combined.

Despite the interesting theoretical findings, effect sizes for the ANOVAs were rather small. This could be attributed to the fact that the transition to work is a process in which major changes occur: It is likely that other variables contribute to work-related learning, such as career competences (Kyndt & Baert, 2013; Noe & Wilk, 1993) or anxiety (Maurer *et al.*, 2003), which could be examined in future research. Although not the focus of the current study, prior research indicated that some contextual factors are of importance for work-related learning, for example work domains or sector (Kyndt & Baert, 2013). While this study did not take these factors into account, the used instrument measuring work-related learning was validated in a heterogeneous sample and measurement invariance was demonstrated across sectors (Grosemans *et al.*, 2018). Besides including additional personal factors, future research could take contextual aspects of the first job into account when investigating work-related learning of early-career employees.

Despite its value, it has to be acknowledged that this study comes with a number of limitations. First, this study focused on early-career employees. Therefore, only those graduates who had found work 4 months after graduation were included in the analyses. However, it could be argued that graduates with a stronger motivational profile found a job more easily and that finding a job influenced their achievement goals at the last wave of data collection (Elliot & McGregor, 2001). As such, the results should not be generalized to all graduates in the transition from higher education to work. It would be interesting for future research to investigate the motivational profiles of unemployed graduates or to

include a larger time span (i.e., collecting data at a moment when more graduates found work).

A second limitation refers to the measurement of achievement goals. The items in the used measurement instrument are encompassing a goal and a motive simultaneously (Hulleman, Schrager, Bodmann, & Harackiewicz, 2010). Despite the value of this type of measurement, it is 'difficult to know exactly which aspect of the achievement goal should be considered responsible for any hypothesized or observed effects' (Elliot & Thrash, 2001, p. 141). Therefore, it would be interesting to replicate the findings including measures for both achievement goals and motives to pursue these goals (Sommet & Elliot, 2017).

Third, all measures included in this study relied on self-reported estimations of the individuals, raising the question of self-report bias (Spector, 1994). Nonetheless, according to Spector (1994) self-report measures are an acceptable way of retrieving information on achievement goals and self-efficacy. To measure work-related learning, however, future research could alleviate concerns about potential bias by adding measures completed by other individuals such as colleagues or supervisors (Simmering, Colquitt, Noe, & Porter, 2003).

A final limitation concerns a common limitation in longitudinal research: missing data. Despite the effort that was made to maximize participation during the four waves, not every respondent participated every wave. Furthermore, because of the focus on early-career employees, we could only include those participants that provided information on their employment status. However, missing data techniques were applied in order to limit the bias (Enders & Bandalos, 2001). In total, 814 participants were included in the analyses and complete data were available for 42.63% of those participants, providing a sample that was large enough to apply missing data techniques and to draw conclusions.

The present study contributes to theory on transition processes by investigating profiles of students longitudinally during the transition to work. The results indicate that self-efficacy, learning-goal, and performance-approach orientation increase and performance-avoidance orientation decreases, suggesting that the preparation for the transition triggers change in these personal factors. Furthermore, distinct motivational profiles were identified, providing evidence that personal factors and their development vary across individuals. Moreover, the interactive effect of goal orientations on work-related learning activities was illustrated. As such, this study contributed to research on the transition to work by focusing on personal factors and relating motivational profiles of students to differences in outcomes after graduation. Hence, this study shows the value of adopting a longitudinal person-centred approach in studying transition processes.

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Appendix A: Longitudinal measurement invariance

Scale	Model	χ^2 (df)	CFI	RMSEA – 90% CI	BIC	Model comparison	$\Delta\chi^2$ (Δ df)	p	Δ CFI
Self-efficacy	Model 1 (configural invariance)	820.350 (410)	.958	.035 (0.032; 0.039)	43417.304				
	Model 2 (equal loadings)	855.081 (431)	.957	.035 (0.031; 0.038)	43324.681	Model 1 versus Model 2 (metric invariance)	35.518 (21)	.025	–.001
	Model 3a (+ equal intercepts)	965.841 (452)	.947	.037 (0.034; 0.040)	43307.629	Model 2 versus Model 3a (scalar invariance)	126.249 (21)	<.001	–.010
	Model 3b (+ equal intercepts ^a)	942.395 (451)	.950	.037 (0.033; 0.040)	43286.717	Model 2 versus Model 3b (scalar invariance)	97.998 (20)	<.001	–.007
	Model 1 (configural invariance)	462.676 (210)	.943	.038 (0.034; 0.043)	34167.226				
Learning-goal orientation	Model 2 (equal loadings)	486.971 (225)	.941	.038 (0.033; 0.042)	34095.416	Model 1 versus Model 2 (metric invariance)	24.652 (15)	.055	–.002
	Model 3a (+ equal intercepts)	551.038 (240)	.930	.040 (0.036; 0.044)	34062.570	Model 2 versus Model 3a (scalar invariance)	65.470 (15)	<.001	–.011
	Model 3b (+ equal intercepts ^b)	534.364 (239)	.933	.039 (0.035; 0.043)	34051.354	Model 2 versus Model 3b (partial invariance)	50.910 (14)	<.001	–.008
	Model 1 (configural invariance)	132.545 (74)	.985	.031 (0.022; 0.040)	29410.554				
	Model 2 (equal loadings)	167.593 (83)	.978	.035 (0.028; 0.043)	29388.857	Model 1 versus Model 2 (metric invariance)	35.651 (9)	<.001	–.007
Performance- approach orientation	Model 3a (+ equal intercepts)	333.104 (92)	.938	.057 (0.050; 0.063)	29511.183	Model 2 versus Model 3a (scalar invariance)	176.741 (9)	<.001	–.041
	Model 3b (+ equal intercepts ^c)	220.333 (91)	.967	.042 (0.035; 0.049)	29391.935	Model 2 versus Model 3b (partial invariance)	56.605 (8)	<.001	–.011
	Model 3c (+ equal intercepts ^d)	187.053 (90)	.975	.036 (0.029; 0.044)	29361.848	Model 2 versus Model 3c (partial invariance)	20.091 (7)	.005	–.003

Continued

Appendix A. (Continued)

Scale	Model	χ^2 (df)	CFI	RMSEA – 90% CI	BIC	Model comparison	$\Delta\chi^2$ (Δdf)	p	ΔCFI
Performance-avoidance orientation	Model 1 (configural invariance)	131.455 (74)	.985	.031 (0.022; 0.039)	29778.710				
	Model 2 (equal loadings)	146.532 (83)	.983	.031 (0.022; 0.039)	29734.191	Model 1 versus Model 2 (metric invariance)	14.964 (9)	.092	-.002
	Model 3 (+ equal intercepts)	178.976 (92)	.977	.034 (0.027; 0.041)	29709.473	Model 2 versus Model 3 (scalar invariance)	34.850 (9)	<.001	-.006

Notes. ^aExcept one intercept at wave 4 ('I will be able to achieve most of the goal that I have set for myself').

^bExcept one intercept at wave 4 ('I will try my best to improve my achievements from the past').

^cExcept one intercept at wave 4 ('I like showing that I am performing better than other students').

^dExcept two intercepts at wave 4 ('I like showing that I am performing better than other students' and 'I prefer working on projects in which I can show my competences to others').

Appendix B: Comparison of estimates (and 95% confidence intervals) of intercepts and slopes in LCGA

	Profile 1		Profile 2		Profile 3		Profile 4	
	All (N = 143)	Excluding 62 (N = 121)	All (N = 339)	Excluding 62 (N = 310)	All (N = 194)	Excluding 62 (N = 187)	All (N = 138)	Excluding 62 (N = 134)
SE								
Intercept	1.268 (1.062; 1.474)	1.251 (1.042; 1.459)	0.685 (0.518; 0.853)	0.680 (0.513; 0.846)	0.658 (0.453; 0.853)	0.649 (0.442; 0.856)	0.000	0.000
Slope	0.112 (0.018; 0.206)	0.115 (0.019; 0.211)	0.249 (0.155; 0.343)	0.244 (0.150; 0.337)	0.181 (0.083; 0.278)	0.181 (0.084; 0.278)	0.254 (0.095; 0.412)	0.254 (0.097; 0.412)
LgO								
Intercept	1.145 (1.180; 1.650)	1.418 (1.181; 1.656)	0.608 (0.370; 0.847)	0.613 (0.370; 0.855)	0.753 (0.446; 1.060)	0.753 (0.443; 1.064)	0.000	0.000
Slope	0.218 (0.105; 0.331)	0.195 (0.081; 0.309)	0.340 (0.212; 0.468)	0.324 (0.195; 0.453)	0.125 (-0.064; 0.313)	0.124 (-0.063; 0.311)	0.197 (-0.023; 0.417)	0.198 (-0.026; 0.422)
PAP								
Intercept	0.556 (0.157; 0.954)	0.555 (0.141; 0.970)	0.613 (0.282; 0.944)	0.616 (0.270; 0.962)	-0.725 (-1.201; -0.247)	-0.729 (-1.226; -0.233)	0.000	0.000
Slope	0.875 (0.656; 1.094)	0.807 (0.587; 1.026)	0.844 (0.717; 0.971)	0.839 (0.712; 0.966)	0.927 (0.771; 1.178)	0.961 (0.755; 1.167)	0.910 (0.716; 1.104)	0.904 (0.706; 1.120)
PAV								
Intercept	-1.595 (-2.002; -1.188)	-1.592 (-2.006; -1.179)	-0.127 (-0.596; 0.342)	-0.129 (-0.612; 0.354)	-1.482 (-1.867; -1.097)	-1.473 (-1.864; -1.082)	0.000	0.000
Slope	-0.286 (-0.494; -0.079)	-0.292 (-0.504; -0.079)	-0.217 (-0.376; -0.059)	-0.208 (-0.365; -0.050)	-0.071 (-0.264; 0.121)	-0.076 (-0.271; 0.118)	0.095 (-0.138; 0.328)	0.084 (-0.150; 0.317)

Notes. SE = self-efficacy; LgO = learning-goal orientation; PAP = performance-approach orientation; PAV = performance-avoidance orientation. In a LCGA, the intercepts of the last profile are fixed to zero.