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Understanding the direct and indirect relations between motivation to participate, goal orientation and the use of self-regulation strategies during a formal training

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Abstract: The current study investigates the direct and indirect relations between motivation to participate, as measured by self-determination theory, goal orientation at the start of the training and use of self-regulation strategies during a formal training. In total, 717 employees completed a questionnaire that consisted of existing scales that were adapted and validated for the context of work-related learning. Results show a positive direct relation between autonomous motivation and a mastery-approach goal orientation, and the use of self-regulation strategies. A significant indirect relation of autonomous motivation through a mastery-approach goal orientation was also found. In addition, results pointed to a negative impact of work-avoidance goal orientation on the use of self-regulation strategies. The latter approach also fully mediated the relation between controlled motivation and a-motivation on the one hand and self-regulated learning on the other. These results point towards the complexity of the relation between motivational dimensions and quality of learning in work-related learning.

Keywords: Goal orientation • Self-determination theory • Self-regulation strategies • Work-related learning

Verständnis der direkten und indirekten Beziehungen zwischen Teilnahmemotivation, Zielorientierung und dem Gebrauch von Selbstregulierungsstrategien während einer formellen Fortbildung

Zusammenfassung: In der vorliegenden Studie werden direkte und indirekte Beziehungen zwischen der selbst- versus fremdbestimmten Motivation zur

Weiterbildungsteilnahme, Zielorientierungen zu Beginn der Weiterbildung und Nutzung von Selbstregulationsstrategien während der Weiterbildung untersucht. Insgesamt nahmen 717 Arbeitnehmer an der Studie teil. Die genannten Konstrukte wurden mithilfe etablierter Skalen erfasst, die für das Lernen im beruflichen Kontext adaptiert wurden. Die Ergebnisse zeigen einen positiven Zusammenhang zwischen selbstbestimmter Teilnahmemotivation, Lernzielorientierung und dem Einsatz von Selbstregulationsstrategien. Selbstbestimmte Teilnahmemotivation und Selbstregulationsstrategien zeigten darüber hinaus einen signifikanten über Lernzielorientierung vermittelten indirekten Zusammenhang. Die Ergebnisse weisen zudem auf einen negativen Einfluss von Arbeitsvermeidungszielorientierung auf den Einsatz von Selbstregulationsstrategien hin. Arbeitsvermeidungszielorientierung vermittelte auch den Effekt fremdbestimmter Teilnahmemotivation bzw. Amotivation auf den Einsatz von Selbstregulationsstrategien. Insgesamt weist die Studie damit auf eine hohe Komplexität der Zusammenhänge zwischen Motivation und Lernqualität im beruflichen Kontext hin.

Schlüsselwörter: Selbstbestimmungstheorie • Zielorientierung • Berufsbezogenes Lernen • Selbstregulationsstrategien

1. Introduction

International organizations such as OECD and the European Union agree that most developed countries are evolving towards a knowledge-based and service-based economy (Dumont and Istance 2010; European Union 1995). Within this economy, organizations have to continuously develop, adapt, innovate or even reinvent themselves to keep or improve their competitive position (Arguinis and Kraiger 2009; Gijbels et al. 2010). Consequently, the knowledge, skills and attitudes employees need to remain competent in their job are constantly changing. It seems that being able to adapt and continuously improve is becoming important for employees as well as the organisation they are working for (Grossman and Salas

2011).

This puts work-related learning at the forefront of the occupational landscape. In the current study we define work-related learning in line with Kyndt and Baert (2013, p. 275). They describe it as: 'The engagement in formal and informal learning activities, whereby employees and groups of employees acquire and/or improve competences that change individuals' present and future professional achievement and performance.' Our study, however, is solely concerned with the formal aspect of work-related learning. It is well known that formal training activities will not necessary result in the well-trained workforce that can make the difference for the knowledge intensive organisation (Quinones and Ehrestein 1997). One decisive factor in predicting training effectiveness is 'What trainees bring to the training setting' (Chiaburu and Marinova 2005; Salas and Cannon-Bowers 2001). Especially the motivation of training participants seems crucial (Chiaburu and Marinova 2005; Grossman and Salas 2011). Two motivational frameworks have received a lot of research-attention in this regard are goal orientation theory (Chiaburu and Marinova 2005; Ford et al. 1998; Salas and Cannon-Bowers 2001) and self-determination theory (Gorges et al. 2013; Kyndt et al. 2012; Vanthournout et al. 2014). It is surprising however that, although formal training has been investigated on a regular basis, the majority of this research focuses on the mere participation (Kyndt and Baert 2013). In contrast to the context of formal higher education (See for instance Baeten et al. 2010), less is known regarding the quality of learning that take place during these activities and the relation with pre-training motivation.

In addition, although Mathieu and Martineau (1997) have suggested that the combination of various theoretical approaches could prove useful for advancing research and practice in the area of training and development, a significant part of the existing research adopts only a single motivational framework to tap into participants' motivation at the start of a training (e.g. Vanthournout et al. 2014). If we want to understand the complexity of how

motivational aspects are intertwined and together affect the quality of learning, it seems reasonable to incorporate multiple frameworks and explore their direct and indirect relations with learning behaviour.

To remedy this dearth, the current study investigates the link between participants' motivation to participate in a specific training, their goal orientation with regard to that specific training and their self-perceived use of self-regulation strategies as an operationalization of the quality of learning.

2. Theoretical background

Different motivational theories elucidate specific aspects of the relation between motivation and learning. Two frequently used motivational theories, self-determination theory (Deci and Ryan 2000) and goal orientation theory (Kaplan and Maehr 2007) seem especially promising in the context of work-related learning. Both theories have already provided valuable and unique insights in explaining individual differences in quality of learning across all levels of formal education (e.g. Cano and Berbén 2008; Niemic and Ryan 2009; Remedios and Richardson 2013). Moreover, these motivational frameworks have already been used separately in the context of work-related learning to target participants' pre-training motivation (Chiaburu and Marinova 2005; Vanthournout et al. 2014). We consequently believe that these frameworks might also be helpful in understanding individual differences in the quality of work-related learning.

2.1 Quality of learning: Use of self-regulatory learning strategies

Self-regulated learning pertains to learners' self-generated thoughts, feelings, strategies and

behaviours oriented towards attaining specific learning goals (Schunk and Zimmerman 1998). It is an umbrella term for various processes such as goal setting, metacognition and self-assessment, all of which influence the quality of the learning process (Loyens et al. 2008). Although various models of self-regulated learning exist, most contain a similar conceptual base of three components: the cognitive, the metacognitive and the motivational (Pintrich 2000; Sitzmann and Ely 2011).

Research within educational settings agrees that the degree to which students adopt self-regulation strategies is dependent on their motivational drives (Sierens et al. 2009; Vanthournout 2011) or the goals learners adopt (Pintrich 2000). Whilst self-regulated learning has been intensively researched in school and academic contexts, less is known about its' role in work-related learning (Schultz and Rossnagel 2010). We therefore wanted to investigate how motivation is related to the use learning strategies in the context of formal work-related learning. In our study, we chose to focus on the use of metacognitive learning strategies. These strategies entail learners' planning, monitoring and evaluation of their cognitive learning processes. Specific strategies are for instance setting goals, managing one's effort, adjusting cognitive resources allocation to content difficulty or adapting strategies based on an interim evaluation of the progress (Sitzmann and Ely 2011). We opted for these strategies for two reasons. First, we believe that the use of metacognitive strategies is less dependent on the content of the training. Second, based on earlier research (Sitzmann and Ely 2011), it is our conviction that the used of meta-cognitive learning strategies are a good indicator of the quality of the learning process in situations in which little external regulation of the learning process is present.

2.2 Motivation to participate

Self-determination theory (SDT) is a contemporary theory of human motivation that has been

used frequently and across various contexts (Deci and Ryan 2000). The SDT-model is multidimensional in the sense that it taps into individual differences in both the quality and the quantity of motivation (Vansteenkiste et al. 2004).

Regarding qualitative differences in the regulations that motivate behaviour, SDT distinguishes between autonomous motivation and controlled motivation. Individuals, who are autonomously motivated, engage in behaviour because they choose to do so. They find the activity interesting in its' own sense or perceive it to be relevant or valuable for achieving a more distant goal, such as their own work performance (Van den Broeck et al. 2008). Autonomously motivated people share the idea of volition and personal choice (Ryan and Deci 2000). Individuals who endorse a controlled motivational drive feel pressured to engage in behaviour. This pressure can stem from external sources such as receiving rewards or fulfilling the expectations of others, but can also result from internal feelings such as shame, fear or guilt. Individuals who are driven by controlled motivation share feelings of pressure and stress as a common denominator. SDT also incorporates a quantitative dimension of motivation through the notion of a-motivation (Vallerand et al. 1992). A-motivated individuals lack motivational drives for behaviour altogether. They are apathetic, feel helpless and perceive the behaviour as non-relevant.

The relationship between SDT and learning has been well established within the context of secondary and higher education (Baeten et al. 2008; Kyndt et al. 2011). Research has found autonomous learning to be related to deep learning (Kyndt et al. 2011; Sobral 2004; Vanthournout 2011) and higher scores on self-regulation (Donche and Van Petegem 2008). A negative relation between autonomous motivation and surface learning (Kyndt et al. 2011; Sobral 2004; Vansteenkiste et al. 2004) has also been demonstrated. Donche and Van Petegem (2008) found a positive link between controlled motivation and aspects of reproduction-oriented learning. In previous research, a-motivation was correlated negatively

with a deep learning and positively with a surface learning (Sobral 2004) or a lack of regulatory strategies (Donche and Van Petegem 2008).

Only a few studies have touched upon the issue of motivation for work-related learning and its' relation with quality of learning. Kyndt and colleagues (2012) reported that both controlled and autonomous motivation for work relate positively to deep approaches to learning at the workplace. Vanthournout and colleagues (2014) uncovered similar links. In addition, their results also demonstrated a negative relation of a-motivation with a deep approach to learning and a positive relation with a surface approach. In the current study, SDT is used as a framework for conceptualizing participants' reasons for participating in a professional development activity.

2.3 Goal orientation

The goal orientation framework (GO) describes differences in why and how people are trying to achieve various objectives (Anderman and Maehr 1994) and refers to variations in the overarching purposes of achievement behaviour (Kaplan and Maehr 2007). As such it provides a complementary viewpoint to SDT. Contemporary research within this theory has mainly focused on a two by two framework. One axis of the framework distinguishes between a mastery GO and performance GO. The other axis makes a distinction between an approach and an avoidance GO. Learners adopting a *mastery GO* are concentrating on learning or developing their competences (Ames 1992). Their primary focus is the learning task. Learners with a *performance GO* are mostly concerned with demonstrating their competences (Kaplan and Maehr 2007). They are not primarily focussed on the task but on managing how others perceive them during a learning task. Learners adopting an *approach GO* are focussed on achieving (positive) goals, while learners embracing an *avoidance GO* are set on avoiding (negative) goals (Elliot 1999). Combining the two dimensions results the aforementioned two

by two framework (Elliot and McGregor 2001).

Adopting a performance-avoidance GO is associated with the most negative outcomes, while findings on the relation between a performance-approach GO and learning are less unequivocal. Some research links it to less desirable outcomes such as rote learning or surface processing (Elliot 1999), while other research evidences a relation with positive outcomes, especially when test performances are included as outcome measures (e.g. Pintrich 2000). A mastery-approach GO is generally related to positive learning outcomes, such as more self-regulated learning (Pintrich 2000). The mastery-avoidance GO was only sparsely studied up until recently (Pintrich 2003). Existing research points to a mixed pattern of correlates, somewhat similar to the performance-approach GO (Ciani et al. 2011).

Recently goal theorists have expanded their scope and started exploring other aims than achievement goals (Kaplan and Maehr 2007). To capture the orientation of learners not aiming to achieve anything in particular, researchers conceived the notion of work-avoidance GO. Learners adopting this orientation aim to finish a learning activity with the investment of as little time or energy as possible (Skaalvik 1997). A work-avoidance GO is associated negatively with deep learning and test scores. The behavioural patterns of learners adopting this orientation and those adopting a performance-avoidance GO is very similar although the underlying cognitive-affective processes are different (Archer 1994).

As with SDT, few studies have explicitly targeted the link between GO and quality of learning in an organizational context, although the value of the latter framework for organizational psychology in general is recognized (e.g. Button et al. 1996). Existing studies generally confirm the relations mentioned above (Fisher and Ford 1998; Pintrich 2000). We found no research relating work-avoidance GO to quality of learning in the context of work-related learning.

2.4 Relations between SDT and GO

Not that much is known about the link between GO and SDT, though research-interest is rising (Ciani et al. 2011; Gorges et al. 2013; Vansteenkiste et al. 2014). Scholars have pointed out a conceptual overlap between the two frameworks (Gorges et al. 2013), drawing links between mastery-approach goals and autonomous motivation and between performance goals and controlled motivation (Deci and Ryan 2000; Gorges et al. 2013). A number of empirical studies seem to validate this claim. Research demonstrated that a mastery GO is related to dimensions of autonomous motivation (Barkoukis et al. 2007; Brunel 1999; Gorges et al. 2013; Standage and Treasure 2002; Standage et al. 2003) and negatively to controlled motivation (Barkoukis et al. 2007) or a-motivation (Standage et al. 2003). Most of the previous work has also found a positive correlation between a performance GO and controlled motivation (Brunel 1999; Gorges et al. 2013; Ntoumanis 2001) or a-motivation (Brunel 1999; Standage and Treasure 2002).

Regarding the temporal or causal relation between the two frameworks, some scholars assert that both directions are feasible (e.g. Ciani et al. 2011) and to a degree depends on how the theoretical constructs are conceived in a particular study (e.g. Standage et al. 2003). In our study we followed the reasoning Vansteenkiste and colleagues (2014) make in their recent work. These authors state that different regulatory processes (reasons) can guide the adoption of specific types of goals (aims) and that similar motivational drives can lead to the adoption of various goal orientations. Although Vansteenkiste and colleagues assert that, theoretically, each GO can be regulated by all motives, they also agree that some achievement goals “tend to be regulated, on average, in a particular way” (Vansteenkiste et al. 2014, p. 160).

Empirical work on the combined impact of GO and SDT on the quality of learning is still in its infancy. Early results indicate that a controlled regulation of performance-approach GO leads to more negative outcomes (Gillet et al. 2014; Vansteenkiste et al. 2010), while the

autonomous regulation of mastery-approach GO leads to more favourable outcomes (Gaudreau 2012). The study by Gillet and colleagues (2014) seems to be the only one that has been set in an organizational context. The previous work took the perspective of the moderating role of motivational regulations on achievement goals. To our knowledge, no studies have taken the angle of the possible mediating role of achievement goals between motivational regulations and learning. Moreover, the combined impact of a-motivation and a work-avoidance GO has never been explored.

3. The present study

The current study aims at exploring the relationship between GO, SDT and the use of self-regulation strategies in work-related learning. SDT was used to measure participants' reasons to participate in a professional development activity. GO theory depicted the type of goals participants set for themselves at the start of this activity. The use of self-regulation strategies was used to indicate the quality of learning during the activity. The study investigated both direct and indirect relations. More specifically it explored the possible mediating role of GO between motivational regulations and the use self-regulation strategies. Three research questions and various hypotheses guided our work:

(1) Are motivational regulations related to the use of self-regulation strategies during a formal training? Based on theory and previous research, we expect:

- H1: A positive direct effect of autonomous motives to participate on the use of self-regulation strategies.
- H2: A negative direct effect of a lack of motivation on the use of self-regulation strategies.

- H3: A negative direct effect of controlled motives to participate on the use of self-regulation strategies.
- (2) Are goal orientations related to the use of self-regulation strategies during a formal training? Based on theory and previous research, we expect:
- H4: A positive direct effect of a mastery-approach GO on the use of self-regulation strategies.
 - H5: A negative direct effect of a performance-avoidance GO on the use of self-regulation strategies.
 - H6: A negative direct effect of a work-avoidance GO on the use of self-regulation strategies.
- (3) Does GO (partially) mediate the relationship between motivational regulations and the use of self-regulation strategies during a formal training? Based on theory and previous research, we expect:
- H7: A mastery-approach GO (partially) mediates the positive relation between autonomous motivation and the use of self-regulation strategies.
 - H8: A performance-avoidance GO (partially) mediates the negative relation between controlled motivation and the use of self-regulation strategies.

Theory and previous research suggest that the nature of the relation between a performance-approach GO or mastery-avoidance GO and learning is ambiguous (Ciani et al. 2011) and might depend on the design of the learning environment (e.g. Pintrich 2000). As the design of the training was not held stable in our study, no meaningful hypotheses could be formulated.

4. Method

4.1 Respondents

Participants in this study were 718 employees from four organizations: an ICT-firm, an institute for higher education, a training institute, and a socio-economic non-profit organisation. Male ($n = 357$) and female ($n = 360$) respondents were equally represented. On average the participants were 46 years old ($SD = 9.47$) and had 22 years of working experience ($SD = 10.06$).

4.2 Instrument

Participants' motives to participate in a formal training were explored using an adapted version of the Self Regulation Questionnaire (Ryan and Connell 1989) for autonomous and controlled motivation. An adapted version of a scale from the Academic Motivation Scale (Vallerand et al. 1992) was used to measure a-motivation. The resulting instrument contained eighteen items. All items were scored on a five point likert scale ranging from 'totally agree' to 'totally disagree'. A confirmatory factor analysis confirmed the factor structure. An acceptable fit was achieved after allowing three co-variances ($CFI=0.908$; $RMSEA=0.061$; $SRMR=0.067$). Cronbach alpha-values indicated that reliabilities were also acceptable (See Table 1).

Participants' goals at the start of a formal training were assessed using two instruments. An inventory designed by Elliot and McGregor (2001) was administered to measure employees' goals. The instrument contained twelve items, measuring the two by two framework of GO. In addition, employees' work-avoidance GO was measured using three items from a questionnaire developed by Meece et al. (1988). All items were scored on a five point likert scale ranging from 'totally agree' to 'totally disagree'. Confirmatory factor

analysis demonstrated an acceptable fit for the five-factor model (CFI=0.927; RMSEA=0.058; SRMR=0.056). Reliabilities were also deemed acceptable.

Use of regulation strategies during formal training was measured using an adapted version of the regulation strategies scale from the Motivated Strategies for Learning Questionnaire (Pintrich et al. 1991). The scale contained twelve items. Items probed into the use of metacognitive regulation strategies such as orienting, monitoring, evaluating and effort management. All items were scored on a five point likert scale ranging from ‘totally agree’ to ‘totally disagree’. The scale demonstrated an acceptable fit, after allowing three co-variances (CFI=0.928; RMSEA=0.064; SRMR=0.045). The reliability of the scale was also acceptable.

Table 1 about here

Table 1: Constructs, descriptives, reliabilities and sample items

The questionnaire was administered online. In the introduction to the questionnaire participants received a general definition of what was understood as a ‘formal training’ and several elucidating examples of such activities. They were requested to complete the instrument keeping a single training in mind. To explicitly focus participants’ attention, they were asked to indicate the type of training they were keeping in mind (i.e. a workshop, a conference, a course, a MOOC, ...) at the start of the questionnaire. Constructs were thus measured retrospectively and context-specifically, although the specific context for each participant differed.

4.3 Analyses

A stepwise approach was taken in analysing the data, focussing first on direct effects between

the separate variables. This was done using correlational analyses and multiple regressions. Afterwards, results from these analyses were combined. Path analysis was carried out to analyse the complex models and investigate indirect effects.

For the correlations, we conducted out Bonferroni-corrections, adapting the significance level more stringently according to the number of pairwise comparisons, to minimize chances of Type I-errors (Abdi 2007). Effect-sizes were computed in addition to significance levels. For correlational analyses an R-value of .20, .30 and .50 were used as cut-off points for a small, moderate and large effect. Similarly, an η^2 value of minimally .01, .06 and .14 constituted a small, moderate and large effect in the regression analyses (Cohen 1988).

Subsequently, the combined effects of SDT and GO and indirect relations were investigated. We first constructed a path-model containing all significant relations from the previous analyses. Robust Maximum Likelihood was used as an estimator for the model, as this estimator is good at handling skewness in data Likelihood (Knight 2000). Non-significant effects were deleted to construct a parsimonious model. Indicators for model-fit were consulted to assess the quality of the model. A value of .90 and .95 on the comparative fit index (CFI) was used as an indication for an acceptable and good model respectively. For the Root Mean Square Error of Approximation (RMSEA) and the Standardised Root Mean Square Residual (SRMR) values up to .08 were deemed acceptable, while values below .05 were considered as an indication of a well-fitting model (Hu and Bentler 1999). All analyses were carried out with the R software for statistical computing (R development core team 2012).

5. Results

5.1 The relation between motivation to participate and goal orientation

The Bonferroni-correction for fifteen pairwise comparisons lowered the cut-off value for significant relations to .003. Correlational analyses (Table 2) indicated a moderate, positive correlation of autonomous motivation with a mastery-approach GO and a negative, moderate correlation with a work-avoidance GO. Scores on controlled motivation were weakly and positively related to a mastery-avoidance GO, a performance-approach GO and a work-avoidance GO. A moderate, positive link with performance-avoidance GO was found. A-motivation was negatively and weakly related to a mastery-approach GO. A significant, positive correlation was observed to a mastery-avoidance GO, a performance-avoidance GO and work-avoidance goal orientation. The latter relation was moderate, while the first two were weak.

Table 2 about here

Table 2: correlations between motives to participate and goal orientations

Results of the multiple regression analyses (Table 3) indicated that a mastery-approach GO was positively and moderately predicted by autonomous motivation. Scores on a mastery-avoidance GO and performance-approach GO were each significantly and positively predicted by scores on controlled motivation, although the effects were only small. Additionally, controlled motivation moderately predicted scores on the performance-avoidance GO. Lastly, scores on work-avoidance GO were significantly predicted by all motivational regulations. For controlled motivation and a-motivation the effect was positive, for autonomous motivation it was negative. All effects were small.

Table 3 about here

Table 3: GLM with motives to participate as predictor and goal orientations as dependents

5.2 The relation between motivation to participate and the use of self-regulation strategies

The Bonferroni-correction for three pairwise comparisons lowered the cut-off value for significant relations to .017. Correlational analyses indicated a moderate, positive correlation of autonomous motivation with use of regulation strategies ($r=.32$, $p<0.001$). Controlled motivation was not significantly related ($r=-.08$, $p=.04$) while a-motivation was negatively and weakly linked to the use of these strategies ($r=-.21$, $p<0.001$). A multiple regression analysis (Table 4) demonstrated that only autonomous motivation was a significant predictor of the use of self-regulation strategies. The effect was positive and moderate.

Table 4 about here

Table 4: Linear regression with motives to participate as predictor and use of self-regulation strategies as dependent

5.3 The relation between goal orientations and the use of self-regulation strategies

The Bonferroni-correction for five pairwise comparisons lowered the cut-off value for significant effects to .01. Correlational analyses indicated a strong, positive correlation of a mastery-approach GO with use of regulation strategies ($r=.51$, $p<0.001$). A weak positive

correlation with performance-avoidance GO was also observed ($r=.10$, $p=0.009$). Finally, a work-avoidance GO was negatively and moderately linked to the use of self-regulation strategies ($r=-.33$, $p<0.001$). A mastery-avoidance GO ($r=.06$, $p=.10$) and performance-approach GO ($r=.06$, $p=.10$) were not significantly correlated.

A multiple regression analysis (Table 5) indicated two significant predictors. Scores on a mastery-approach GO, positively and strongly predicted of the use of self-regulation strategies. In addition, scores on a work-avoidance GO proved to be a negative and weak predictor.

Table 5 about here

Table 5: Linear regression with goal orientations as predictor and use of self-regulation strategies as dependent

5.4 Direct and indirect effects of motivation on the use of self-regulation strategies

An overall model was constructed based on the significant relations from the previous analyses. Both motivational regulations and goal orientations were combined as direct predictors of the use of self-regulation strategies. The estimates and amount of explained variance in the endogenous variables of this model are included in Table 6. Results demonstrate that all significant relations from the previous analyses remained significant. Next, the indirect effects of motivation to participate on self-regulation through goal orientations were examined. Four such effects were feasible. All these effects also proved significant.

Table 6 about here

Table 6: path model investigating direct and indirect effects between motivation to learn, goal orientations and use of self-regulation strategies

The final model demonstrates that the use of self-regulation strategies is directly predicted by autonomous motivation, mastery-approach GO and work-avoidance GO. In addition, an indirect effect of autonomous motivation via both of these goal orientations was observed. Controlled motivation and a-motivation each have a significant indirect effect on the use of self-regulation strategies through their relation with work-avoidance GO. Finally, it is interesting to note that a controlled motivation to participate also has an impact on the remaining goal orientations, but this does not relate to differences in the use of self-regulation strategies. The total model explains about 30% of the variance in the outcome variable.

The quality of the overall model was insufficient however (CFI=.83, RMSEA=.13, SRMR=.09). Including a covariance between the mastery-approach GO and work-avoidance GO and between a mastery-avoidance GO and a work-avoidance GO increased the model-fit to an acceptable or even a marginally good level (CFI=.96, RMSEA=.07, SRMR=.05).

6. Conclusions

The current study investigated the direct and indirect relationships between employees' motives to participate in a formal training, the goals they set for themselves at the start of that activity and their perceived use of self-regulation strategies during that activity. Our results confirmed the hypothesized positive relation between autonomous motivation and the use of self-regulation strategies (*hypothesis 1*). Moreover, when looking at the link

between GO and quality of learning, two additional hypotheses could be validated: the positive link between a mastery-approach GO and the use of self-regulation strategies (*hypothesis 4*) and the negative relation between a work-avoidance GO and the latter variable (*hypothesis 6*). In addition, results also demonstrated that autonomous motivation was indirectly related to the use of self-regulation strategies through the adoption of a mastery-approach GO (*hypothesis 7*). The combination of these results provides evidence for the claim that also in the context of formal work-related learning high quality motivation is related to high quality learning (e.g. Kyndt et al. 2012). This assertion provides important handholds for the training policies of HR-departments.

An unexpected finding in our study was the important mediating role work-avoidance GO played in our model. Although both controlled motivation and a-motivation did not exert a direct effect on the use of self-regulation strategies, as was hypothesized (*hypothesis 2 & 3*), they were indirectly linked through the adoption of a work-avoidance GO. Otherwise put, employees who feel pressured to participate in a training, or who lack motivation for that training altogether tend to aim for doing as little as possible during that training. This in turn negatively affects their use of self-regulation strategies. This link seems to provide a mechanism by which significant direct relations in earlier research (e.g. Sobral 2004) might be explained. These results plead for further research to also take motivational constructs into account that describe motivational problems. Incorporating such measures may provide a more complete insight of the motivational processes that affect the quality of work-related learning. In addition, for HR-practice, findings point towards the negative consequences of pressuring employees to participate in formal training activities, or forcing them to participate in training of which they do not see the benefits.

Our study did not find a significant direct relation between a mastery-avoidance GO, a performance-approach GO or a performance-avoidance GO on the one hand and the use of

self-regulations strategies on the other hand. Neither could it discern any indirect relation through performance goal orientations as hypothesized (*hypothesis 8*). The lack of effect of the first two types of orientations might be due to the nature of our study. Participants were free to take any recent formal professional development activity in mind when filling in the questionnaire. So it is feasible that that the content as well as the instructional methods used during the envisioned professional development activity differed among participants. As both a performance-approach GO and a mastery-avoidance GO were found to be linked differentially to outcomes in different contexts (Ciani et al. 2011; Pintrich 2000), it is not unthinkable that this mechanism clouded any clear relations in the current study. A study set in the context of a single professional development activity might therefore yield more unequivocal results. Why the negative link between a performance-avoidance GO and the use of self-regulation strategies failed to materialize is uncertain. Previous research is quite clear on that relationship (e.g. Kaplan and Maehr 2007). A possible explanation might be the lower consistency of the performance-avoidance GO scale. More research is definitely needed on the topic.

The current study faces some limitations that hamper the impact and generalizability of our study. First, data were gathered in a cross-sectional design using inventories. This design implies the risk of common method bias inflating the relations between variables. In addition, no causal attributions can be made based on these results. Second, although participants were asked to think of a single formal learning activity, no such activity was imposed. Consequently, participants completed the questionnaire with possibly very differently activities in mind. This might have affected the strength of relations in our study. A data-collection linked to a specific learning activity might yield additional insights.

Nevertheless, we feel that our results provide sufficient ground for conducting further research. It has demonstrated the complexity of the relation between motivation and quality of

learning in the context of work-related learning by elucidating direct as well as indirect relations. Indirectly, although it was not the focus of the study, it also provided additional evidence for the claim that people's goal orientations might be fuelled by different motivational regulations (Vansteenkiste et al. 2014). In our data especially, scores on work-avoidance GO were linked to all three types of motivational regulations. Finally, the study provided indications of the added value of also incorporating dimensions that indicate problems with motivation. Given the fact that in work-related learning some of the factors that externally regulate the quality of the learning process in educational settings are not present (e.g. formal assessment), understanding why and how employee factors affect learning and learning outcomes seem of primordial importance (Gegenfurtner and Vauras 2012).

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