

The role of perceived need satisfaction at work for teachers' work-related learning goal  
orientation

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**Abstract**

In the present study, we investigate whether perceived satisfaction of the basic psychological needs for autonomy, competence, and relatedness in teachers' working environment at school predicts their work-related learning goal orientation. Structural equation modeling was used to test this hypothesis ( $N = 334$  German teachers). The expected relationship between perceived need satisfaction and teachers' work-related learning goal orientation could be shown and was not mediated by teachers' intrinsic work motivation. These results give room for speculation on new ways to foster teachers' work-related learning goal orientation via workplace modifications which address teachers' basic psychological needs.

*Keywords:* teacher motivation, goal orientation, psychological needs, work environment

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## 1. Introduction

Teachers face many achievement situations in their daily work lives, such as teaching difficult students, fulfilling the expectations of parents, and keeping up with the intended curriculum. While all teachers experience these situations, they differ in what goals they ultimately aim to achieve. These individual goal preferences are typically referred to as teachers' work-related achievement goal orientations (Author et al., 2011, Butler, 2007). In this article we focus on one specific work-related achievement goal orientation, namely teachers' work-related learning goal orientation. This can be conceptualized as the striving for professional development in work-related achievement situations. Hence, teachers with a high work-related learning goal orientation experience accomplishment when they are able to acquire new job related skills. Teachers' work-related learning goal orientation is positively associated with a wide range of beneficial outcome variables. For instance, students of teachers with a stronger work-related learning goal orientation view their teachers as more supportive (Butler & Shibaz, 2008). Furthermore, teachers reporting a higher work-related learning goal orientation also reported more instructional practices aiming at the development of learning goals in their students (Retelsdorf, Butler, Streblov, & Schiefele, 2010), more self-reflection regarding their own teaching practices (Runhaar, Sanders, & Yang, 2010) and a higher emphasis on comprehensive learning (Retelsdorf & Günther, 2011). These teachers also reported lower burn-out tendencies (Author et al., 2009; Parker, Martin, Colmar, & Liem, 2012), fewer sick days and a higher attendance at training workshops (Author et al., 2013). Lastly, teachers' work-related learning goal orientation is associated with a positive attitude towards seeking help from colleagues (Butler, 2007). These studies were conducted in Australia (Parker et al., 2012), Germany (Author et al., 2009; 2013; Retelsdorf et al., 2010; Retelsdorf & Günther, 2011), Israel (Butler, 2007; Butler & Shibaz, 2008) and the

Netherlands (Runhaar et al., 2010). Evidence for the importance of teachers' work-related learning goals was also found in Canada (Daniels, Frenzel, Stupnisky, Stewart & Perry, 2013), Finland (Malmberg, 2006, 2008), and Greece (Papaioannou & Christodoulidis, 2007). Thus, the beneficial effects of teachers' work-related learning goal orientation are generalizable to different Western educational systems. From the viewpoint of society and school boards, it might therefore be useful to know which methods and strategies may enhance teachers' work-related learning goal orientation. However, we know very little about which aspects of the working environment could be addressed to enhance the strength of teachers' work-related learning goal orientation. In this article, we investigate teachers' perception of their working environment as a possible influencing factor for their work-related learning goal orientation. More specifically, we will address the perceived satisfaction of the basic psychological needs for autonomy, competence and relatedness in teachers' working place. We assume that teachers are more likely to develop a work-related learning goal orientation when they feel their basic psychological needs are satisfied in their current working environment. This assumption is based on the theoretical framework of Self-Determination Theory.

## **2. Teachers' motivation through the lens of Self-Determination Theory**

Self-Determination Theory (SDT) serves as a theoretical lens for our reflections on teachers' work-related learning goal orientation. The theory centers on the human striving to satisfy the three basic psychological needs for autonomy, competence, and relatedness as well as the importance of need satisfaction for human motivation and well-being (Deci & Ryan, 1985; 2000) The need for *autonomy* is defined as the urge to be under control of one's own life decisions. Individuals experience autonomy when they come to believe that they are free to choose between different meaningful options regarding one's actions and goals (see Assor, Kaplan, & Roth, 2002; Deci & Ryan, 2002; Reeve, Nix, & Hamm, 2003). Research has shown that impairment of this need in teachers' working environment can lead to a decrease in teachers' intrinsic work motivation and also reduce support for student autonomy (Pelletier,

Séguin-Lévesque, & Legault, 2002; Reeve, 2009). The need for *competence* is defined as the urge to feel as though one's actions are effective (Arkes, 1978; Deci & Ryan, 2002; White, 1959). Teachers who perceive themselves as competent at their job are less stressed and report more enthusiasm for their job compared to teachers reporting a low degree of competence (Caprara, Barbaranelli, Steca, & Malone, 2006; Skaalvik & Skaalvik, 2010). Finally, the need for *relatedness* emphasizes the importance of social inclusion and feeling connected to other people (Baumeister & Leary, 1995; Deci & Ryan, 2000). Researchers have emphasized the importance of relatedness to colleagues for motivation and well-being at work (Baard, Deci, & Ryan, 2004).

To explain the relationship between teachers' basic psychological needs and their work-related learning goal orientation, it is important to understand how need satisfaction affects humans. First and foremost, need satisfaction is always a subjective experience. Previous studies have shown that perceived need satisfaction is sensitive to environmental cues such as choice (Assor et al., 2002; Katz & Assor, 2007), feedback (Deci, Koestner, & Ryan, 2001; Vallerand & Reid, 1984), interpersonal signs of affection (Baumeister & Leary, 1995), or ostracism (Williams, 2009). However, the effects of these environmental cues always depend on the personal interpretation of them (Deci & Ryan, 1985, 2002). This makes self-reported perceived need satisfaction a more accurate predictor of human motivation and well-being than objective need support (Broeck, Vansteenkiste, Witte, Soenens, & Lens, 2010; Gagné & Deci, 2005; Sheldon & Hilpert, 2012). Hence, we will focus on teachers' perceived need satisfaction in order to gauge its importance at their workplace. Another important aspect of the mechanism behind need satisfaction is the interdependence of the different basic psychological needs. Deci and Ryan (2000) pointed out that none of the basic psychological needs can be compensated. All three needs are assumed to be equally important for healthy human functioning. Hence, the effect of need satisfaction can only be fully experienced when all three are satisfied. While it might still be interesting to investigate unique effects of the

different needs (e.g., Reis, Sheldon, Gable, Roscoe, & Ryan, 2000), researchers have often aggregated them into one construct labeled *need satisfaction* in order to properly address their shared effect on human motivation (Deci et al., 2001; Niemiec, Ryan, & Deci, 2009). This approach was also applied to research on need satisfaction at work (Gagné & Deci, 2005) and, specifically, in the teaching profession (Hanfstingl, Andreitz, Müller, & Thomas, 2011). In our research, we will address the shared influence of the three basic psychological needs as well as their unique impact. While the shared influence shows the importance of perceived need satisfaction in general, the differential effects by perceived autonomy, perceived competence and perceived relatedness help to uncover the individual importance of each basic psychological need.

Perceived need satisfaction has mainly been investigated in terms of its positive influence on healthy functioning (Reis et al., 2000; Ryan, Huta, & Deci, 2008) and the development of intrinsic motivation (Deci & Ryan, 1985; 2000; for more details see section 2.2). However, we are more interested in the importance of perceived need satisfaction for goal setting. More specifically, we want to uncover possible relations between perceived need satisfaction at the workplace and the development of teachers' work-related learning goal orientation. SDT provides a broad conceptualization of goals into which teachers' work-related learning goals can easily be incorporated. This also provides some interesting implications on possible associations with perceived need satisfaction. However, there has been little to no research bridging the gap between goal conceptualizations in SDT and achievement goals to date.

### **2.1. Teachers' work-related learning goal orientation as preference for intrinsic goals**

SDT differentiates goals according to their content into extrinsic and intrinsic goals (Deci & Ryan, 2000; Kasser & Ryan, 1996). *Extrinsic goals* are defined as the striving for extrinsic motivators, such as fame or money. *Intrinsic goals* conversely are defined as the striving for motivators with intrinsic worth. Typical contents of intrinsic goals are affiliation,

personal growth, health, and freedom. Intrinsic goals and teachers' work related learning goals share some interesting similarities. We will now elaborate on the definition of teachers' work-related learning goal orientation to make it comparable to an orientation on intrinsic goals.

Teachers' work-related learning goal orientation is an achievement goal orientation defined on the basis of three components: aggregation level, goal content and goal valence. First, the aggregation level describes how broadly the associated achievement goal is conceptualized. While the term "achievement goals" is oftentimes used to refer to goals that only affect human motivation and behavior in specific situations, achievement goal orientations describe more stable preferences for a specific kind of achievement goals (Kaplan & Maehr, 2007). This preference influences the process of goal setting in a wide array of achievement related situations (generalized achievement goal orientations) or in a specific achievement related context (domain specific achievement goal orientations). Teachers' work-related achievement goal orientations can be described as domain specific goal orientations located between very specific situational goals and more generalized goal orientations. Second, teachers' work-related achievement goal orientations are characterized by content and are thereby often differentiated in work-related performance goal orientation and work-related learning goal orientation. The goal content is mainly defined by individuals' definition of job success (Butler, 2007). Teachers with a strong work-related learning goal orientation define job success as the acquisition of new job relevant skills and see their job as an opportunity for ongoing learning and professional development. Teachers with a strong work-related performance goal orientation primarily define success as the demonstration of competence and therefore strive to outperform others (Authors et al., 2011; Butler, 2007). Besides differentiation in goal content, achievement goals have also been differentiated regarding their valence, where achievement goals are separated into approach and avoidance goals (Elliot & Church, 1997; Elliot & Harackiewicz, 1996; Elliot & McGregor, 2001). Consequently, teachers' work-related learning goal orientation can either be characterized by an approach

valence (ongoing professional development) or an avoidance valence (meeting requirements without losing existing professional skills). However, most research on teachers' work-related achievement goal orientations solely addresses teachers' learning approach goal orientation (Author et al., 2011; Butler, 2007). Typically the term *teachers' work-related learning goal orientation* is used synonymously with *teachers' work-related learning approach goal orientation*. In order to connect our research to the existing body of research, we also use the term *learning goals* to describe learning approach goals.

After having established this definition of teachers' work-related learning goal orientation, we will now point out the similarities between intrinsic goals and teachers' learning goals. The main similarity lies in the strong parallels between the content of both goal types. Personal growth is a key feature of both teachers' learning goals and intrinsic goals (Vansteenkiste, Lens, & Deci, 2006). However, intrinsic goals can be applied to all sorts of contexts and situations, while teachers' work-related learning goals are limited to work-related achievement situations. In the terminology of SDT, teachers' work-related learning goal orientation can therefore be defined as teachers' preference for intrinsic goals centering on professional development in achievement situations at work.

At this point we can finally elaborate on the relationship between perceived need satisfaction and teachers' work-related learning goal orientation. Intrinsic goals are assumed to be grounded in the striving to satisfy the basic psychological needs (Kasser & Ryan, 1996; Deci & Ryan, 2000; Vansteenkiste et al., 2006). Hence, individuals have to perceive opportunities for need satisfaction in a given environment in order to develop intrinsic goals. We assume that environments that are perceived as need satisfying meet this criterion because they have provided the basis for need satisfaction in the past. Therefore, teachers who experience need satisfaction in their current working environment might be more likely to develop a work-related learning goal orientation. Conversely, teachers who experience need thwarting in their current working environment might abandon possible learning goals and

refocus on external goals such as acquiring their next paycheck. The assumption of a possible relationship between perceived need satisfaction and teachers' work-related learning goals is supported by empirical research on achievement goal orientations in students.

## **2.2. Perceived need satisfaction and learning goals**

Due to lack of research on antecedents of teachers' work-related learning goal orientation, we will have to take a step back and look at research conducted with students. First of all, research conducted by Ames (1992) emphasizes that support for student autonomy enhances their learning goal orientation. Additionally, research on intrinsic goals has also shown that autonomy support strengthens the effect of intrinsic goal framing on outcome variables like depth of processing and task persistence (Vansteenkiste, Simons, Lens, Sheldon, & Deci, 2004). Furthermore, the need for competence can be addressed with the provision of supportive feedback focusing on personal improvement (Deci et al., 2001; Vallerand & Reid, 1984). Therefore, empirical evidence linking this kind of feedback in the classroom to the development of students' learning goal orientation (Ames, 1992; Meece, Anderman, & Anderman, 2006) supports the hypothesis that the need for competence plays an important role in the development of a learning goal orientation. To illustrate, Senko and Harackiewicz (2005) showed that thwarting the need for competence via negative feedback effectively reduces learning goals. The need for relatedness is actually the most challenging basic psychological need with regard to the provision of empirical proof for its relationship to learning goals. Theorists have pointed out the importance of this need for the development of intrinsic goals (Deci & Ryan, 2000; Vansteenkiste et al., 2006), but have not investigated the assumed relationship between the two constructs. However, research on learning supportive classroom structures points out that a collaborative atmosphere is an important foundation for the development of students' learning goals (Ames, 1992; Meece et al., 2006). Furthermore, need thwarting via social ostracism directly leads to a stronger striving to outperform others

(i.e., performance goals; Jamieson, Harkins, & Williams, 2010), possibly at the cost of learning goals.

Based on the abovementioned empirical studies, we assume that each of the basic psychological needs plays an important role for the development of a learning goal orientation. The empirical evidence is strongest for the importance of perceived competence, while perceived relatedness has inspired less research in the field of goal setting. However, due to the interdependence of basic psychological needs, we can assume that all basic psychological needs are jointly important for the development of a learning goal orientation. This leads us to the conclusion that teachers' perception of need satisfaction at work should predict the strength of their work-related learning goal orientation.

Apart from giving first evidence for the importance of need satisfaction as an antecedent of a learning goal orientation, research on students' learning goal orientation also raises an interesting question on the association between intrinsic motivation and a learning goal orientation. Some teaching strategies applied to strengthen students' learning goal orientation directly aim to enhance students' interest in the current task (Ames, 1992). This is important because interest has been established as a core dimension of intrinsic motivation (Deci, 1976), which is a direct consequence of perceived need satisfaction (Deci & Ryan, 1985; 2000). If intrinsic motivation fosters the development of a learning goal orientation as implied by the research on learning goal supportive classroom structures (Ames, 1992; Meece et al., 2006), it could also serve as a mediator for the relationship between need satisfaction and the strength of the learning goal orientation. This means that when investigating the relationship between perceived need satisfaction at work and teachers' work-related learning goal orientation, we also have to carefully consider the role of teachers' intrinsic work motivation – defined as teachers' motivation to engage in their job because they find it interesting and enjoyable (Malmberg, 2006; Roth, Assor, Kanat-Maymon, & Kaplan, 2007).

### **2.3. The role of teachers' intrinsic work motivation**

It is unclear whether intrinsic motivation should be seen as an antecedent or a consequence of learning goal orientation. Elliot and Harackiewicz (1996) argued that people with a strong learning goal orientation perceive achievement situations as challenges. As a response to this challenge, individuals with a high degree of learning goal orientation would invest cognitive resources and deeply engage in the task itself. Subsequently, they would be more likely to experience success, positive task related emotions and, consequently, intrinsic motivation. Related to this, Vansteenkiste et al. (2006) established intrinsic motivation as a potential mediator of the relationship between intrinsic goals and achievement related outcome variables.

While the aforementioned literature seems to support the view that intrinsic motivation is a consequence of a learning goal orientation as well as perceived need satisfaction, there is also empirical evidence that intrinsic motivation predicts a learning goal orientation (as implied by Ames, 1992; Meece et al., 2006). Ciani, Sheldon, Hilpert, and Easter (2011) argue and found that broader motives, such as students' intrinsic motivation for a certain subject, should influence smaller, more situated motives, such as students' learning goals in a certain course on this subject. This line of reasoning is valid if intrinsic motivation is actually conceptualized on a higher aggregation level than learning goals. However, both constructs can be applied to specific situations (situation-specific goals, task-related intrinsic motivation), a specific context (domain-specific goal orientations, intrinsic motivation for tasks in a certain domain), or in the case of goal orientation, on a more dispositional aggregation level (generalized goal orientations). Teachers' work related learning goal orientation and their intrinsic work motivation can both be described as domain-specific motivational variables, applicable for the working context of teachers. Hence, both variables share the same aggregation level. A study investigating the relationship between those two variables could help to uncover how they are related without capitalizing on differences in the

aggregation level. To illustrate, one teacher motivation study investigated the relationship between intrinsic motivation and learning goal orientation in two cross-sectional samples of teacher applicants (Malmberg, 2006). In the first sample, the (generalized) learning goal orientation of teacher applicants at the beginning of their studies predicted their intrinsic motivation for the teaching job they would later acquire. In light of the argumentation on construct aggregation applied by Ciani et al. (2011), these results might actually reflect different aggregation levels of the two constructs. In this case, a broader conceptualized learning goal orientation predicts a domain specific intrinsic motivation. However, in the second sample of students who were further into their studies than the first sample, the intrinsic job motivation predicted the degree of learning goal orientation regarding own professional development. Here both constructs shared the same aggregation level. While Malmberg (2006) concluded that both constructs might affect each other bidirectionally, this empirical evidence also supports the hypothesis that intrinsic motivation might stimulate the development of learning goals when conceptualized on the same aggregation level.

It remains unclear how the association between teachers' work-related learning goal orientation and their intrinsic work motivation can be disentangled. However, with the studies by Ciani et al. (2011) and Malmberg (2006) in mind, we have to take the possibility of intrinsic motivation causing the development of a learning goal orientation into account. This has consequences for the assumption of a direct relationship between teachers' perceived need satisfaction at work and teachers' work-related learning goal orientation. Teachers' intrinsic work motivation could indeed mediate the relationship between these two variables. Need satisfaction at work may provide teachers with a higher degree of intrinsic work motivation. This may eventually enhance their tendencies to form a work-related learning goal orientation. While we still believe that a direct effect of perceived need satisfaction at work on teachers' work-related learning goal orientation is plausible, the presented arguments make it

necessary to control this effect for a potential mediation by teachers' intrinsic work motivation.

#### **2.4. Summary and hypotheses**

By adopting an SDT perspective on teacher motivation, we conclude that the perceived satisfaction of the basic psychological needs for autonomy, competence and relatedness in teachers' working context should be predictive for the strength of teachers' work-related learning goal orientation. More concretely, we expect perceived need satisfaction at work to positively predict teachers' work-related learning goal orientation. While this relationship might be partly mediated by intrinsic work motivation, we assume that intrinsic motivation cannot fully explain the predicted direct effect of perceived need satisfaction at work on teachers' work-related learning goal orientation. In the following study, we will test the assumed direct effect of perceived need satisfaction at work on teachers' work-related learning goal orientation in three steps, ranging from weak to strong empirical evidence for the relevance of teachers' basic psychological needs. In step 1, we will test that the shared effect of all three needs (perceived need satisfaction) predicts teachers' work-related learning goal orientation (Hypothesis 1). In step 2, we will investigate that this direct effect still occurs after controlling for teachers' intrinsic work motivation (Hypothesis 2). Even though we have no clarity on the exact causal mechanism behind the relationship between teachers' intrinsic work motivation and their work-related learning goal orientation, we will include intrinsic work motivation as a potential mediator of the relationship between teachers' need satisfaction at work and teachers' work-related learning goal orientation. This approach delivers a conservative test for our assumed association between teachers' perceived need satisfaction at work and their work-related learning goal orientation. In the third and final step, we will investigate whether – beyond the shared impact of perceived need satisfaction - differential effects of perceived need satisfaction for autonomy (Hypothesis 3a), competence (Hypothesis 3b) and relatedness (Hypothesis 3c) on the strength of teachers'

work-related learning goal orientation can be observed. The occurrence of such differential effects would make a strong point for the unique importance of each basic psychological need for teachers' work-related learning goal orientation.

### 3. Method

We conducted a quantitative cross-sectional survey study to address our research question. In the following section, we will describe our sample, the scales used to assess the relevant variables, and our analysis procedures.

#### 3.1. Sample

We questioned German teachers in an online survey. The survey was distributed via online newsgroups and mailing lists for people working in the teaching profession. Participants were assured that their responses would remain confidential and would be used for scientific purposes only. Among all participants, 10 vouchers worth €15 each from a well-known online marketplace were raffled. A total of 334 participants completed the survey, 65.7% of which were female, with a mean age of 42.1 years ( $SD = 11.2$ ). Their teaching experience ranged from 0 to 41 years ( $M = 13.3$ ,  $SD = 11.5$ ) and they were employed in all tracks of the German school system. Elementary school teachers made up 11.1% of the sample but the majority of teachers (73.7 %) worked in secondary schools [Insert Footnote 1]. Most of these teachers (45.8%) worked in academic track secondary schools (i.e., *Gymnasium*), preparing students for university. Additionally, 4.2% of the teachers worked in lower track secondary schools (i.e., *Hauptschule*), 8.1% in intermediate track secondary schools (i.e., *Realschule*) and 10.5% worked in comprehensive schools, which combine all three tracks (i.e., *Gesamtschule*). Also, 5.1% of the teachers worked in special schools for physically and mentally handicapped students (i.e., *Sonderschule*). Besides those teachers working in primary or secondary education, there was a minority (10.7%) working in vocational schools (i.e., *Berufsschule*), which are part of tertiary education. The last 4.5% of the questioned teachers reported to work in another school type.

### 3.2. Measures

**3.2.1. Need satisfaction at work.** *Perceived need satisfaction* was measured with the German version of the *balanced measure of psychological needs (BPMN)*; Sheldon & Schöler, 2011). The questionnaire consists of three subscales, one for every basic psychological need, using a 5-point Likert-type scale ranging from 1 (*no agreement*) to 5 (*strong agreement*). Each subscale consists of six items. Three items are positively and three negatively worded. Sheldon and Hilpert (2012) pointed out that the items therefore included variance of three content factors (perceived autonomy, perceived competence, perceived relatedness) as well as two methodological factors, due to the item wording (*need satisfaction* and *need dissatisfaction*). The items were slightly altered to properly address the working conditions at school. For instance, the original item "I am free to do things my own way" from the subscale *perceived autonomy* was changed to "During my everyday work as a teacher, I am free to do things my own way." An example for *perceived competence* is "During my everyday work as a teacher, I successfully complete difficult tasks and projects." *Perceived relatedness* was assessed with items such as "During my everyday work as a teacher, I feel close and connected with colleagues who are important to me." Our adapted scale was pretested with a sample of 129 teachers in training. Convergent validity was verified by associations between the subscales for perceived autonomy, perceived competence and perceived relatedness and the corresponding subscales of the basic psychological needs at work scale (*BPNS*; Gagné, 2003 translated by Hanfstingl et al., 2011) [Insert Footnote 2]. All subscales had acceptable internal consistencies [Insert Footnote 3] in the pretest ( $\alpha_{Autonomy} = .78$ ,  $\alpha_{Competence} = .74$ ,  $\alpha_{Relatedness} = .81$ ) as well as in the main study (see Table 1).

**3.2.2. Work-related learning goal orientation.** We used the nine-item corresponding subscale from the *goal orientation questionnaire for teachers* (Author et al., 2011) to assess teachers' work-related learning goal orientation. Previous studies have shown that the utilization of a 5-point Likert-type scale often leads to ceiling effects in samples of teachers

(Author et al., 2011, 2013). We hoped to avoid these ceiling effects by extending the scale range to a 7-point Likert-type scale with scale limits from 1 (*total disagreement*) to 7 (*total agreement*). The nine items of the questionnaire form three subscales addressing teachers' *pedagogical learning goal orientation*, *pedagogical content learning goal orientation*, and *content-related learning goal orientation*. An example item for addressing the pedagogical learning goal orientation is "In my vocation, I aspire to improve my pedagogical knowledge and competence," (the items of the scale are completely depicted by Author et al., 2011). Since we were not interested in the subscales but rather in the overall work-related learning goal orientation, we conducted a reliability analysis with all nine items according to the recommendation by Author et al. (2011). This analysis provided a good internal consistency ( $\alpha = .88$ ) and thereby an argument for the extraction of a general factor.

**3.2.3. Intrinsic work motivation.** The strength of *intrinsic work motivation* was assessed with the corresponding subscale of the *teachers' motivation scale* (Müller, Hanfstingl, & Andreitz, 2009). The scale consisted of five items. All items were positively worded and used the same 5-point Likert-type scaling as the *balanced measure of psychological needs*. A sample item for this subscale is "I engage in my job as a teacher because I find my job very exciting." The scale showed an acceptable internal consistency in our sample ( $\alpha = .79$ ).

### 3.3. Analyses

We analyzed our data in two steps to answer our research questions. In a first step, we conducted preliminary analyses to assess the multivariate normality of our data. In this step, we also tested if the zero-order-correlation between the perceived satisfaction of teachers' basic psychological needs at work and their work-related learning goal orientation was significant and pointed in the right direction. In a second step, we tested the robustness of the association using structural equation models. We thereby conducted analyses in ascending strictness, ranging from liberal to more conservative approaches to assess the relationship

between teachers' basic psychological needs and their work-related learning goal orientation. In this section, we will first describe the subsequent analyses steps in detail and then provide an overview on the standards used for the evaluation of the conducted structural equation models.

### **3.3.1. Procedures**

In the preliminary analyses we checked if anomalies occurred in our data. We primarily focused on aberrations from the univariate normal distribution of the obtained scales. This test was important because univariate normality of all used subscales is a required prerequisite for the assumption of multivariate normality (Looney, 1995). Furthermore, the degree of multivariate normality has implications for the decision on the adequate model estimator for structural equation modeling: Multivariate Normality is an important prerequisite for the use of the maximum likelihood estimator (ML), which is typically applied in SEM analyses with Mplus. On the contrary, in cases of non-normality the more robust maximum likelihood estimator with mean- and variance-adjusted chi-square test statistics (MLMV) has to be applied. Consequently, the univariate normality was assessed with the Komolgorov-Smirnov test for normality (Lilliefors, 1967). When non-normality occurred, the skewness of the scale was used to indicate the degree of non-normality. In our preliminary analyses, we also took a first look at the zero-order-correlations between all variables to see if the assumed relationship between teachers' need satisfaction at work and their their work-related learning goal orientation was plausible.

Following the order of the hypotheses in section 2.4, three structural equation models were conducted with Mplus Version 7 (Muthén, & Muthén, 1998-2012). In the first model, we addressed the assumed direct effect of perceived need satisfaction on teachers' work-related learning goal orientation in a simple model solely focusing on this relationship. All included constructs were modeled as latent factors. We used item parceling to minimize methodological invariance. As mentioned above, Sheldon and Hilpert (2012) showed that the

scales of the *balanced measure of basic psychological needs* incorporated variance of two methodological factors due to the item wording. While these method factors might be interesting for different research questions, we wanted to strictly focus on the content factors (perceived autonomy, perceived competence and perceived relatedness). Thus, we restrict the methodological invariance by aggregating two item parcels for each content factor: one consisting of positively worded items and the other consisting of negatively worded items. Also, we parceled the three subscales of the goal orientation questionnaire for teachers, because we were only interested in work-related learning goal orientation in general and did not wish to include a two-level factorial structure in our analyses. In our first model, we focused solely on the shared effect of the perceived satisfaction of teachers' basic psychological needs on teachers' work-related learning goal orientation. We therefore modeled one latent second-order factor representing perceived need satisfaction at work indicated by the first-order factors for perceived autonomy, perceived competence and perceived relatedness. From a methodological viewpoint, this approach guaranteed that the expected collinearity of the three indicators would not lead to misspecification of singular beta-weights and misconceptions of their relative importance (Grewal, Cote, & Baumgartner, 2004).

In the second model, we added intrinsic motivation to our analyses as a potential mediator of the direct effect from teachers' perceived need satisfaction at work on their work-related learning goal orientation. In this step we wanted to show that the direct relationship between perceived need satisfaction at work and teachers' work-related learning goal orientation persists, even after controlling for the potential mediation by intrinsic work motivation. Since we wanted to compare the mediational model with the base model, it was important to ensure invariance of factor loadings, which we achieved by fixing the unstandardized factor loadings to the values of the base model. Intrinsic motivation was also modeled on a latent level.

In the third and last model, we tested if unique influences of the different predictors could be observed, which go beyond their shared influence represented in the second-order factor perceived need satisfaction at work. Therefore, we again ensured factorial invariance by fixing the unstandardized factor loadings to the values of the base model, but this time we also modeled the unique variances of all basic psychological needs not explained by the second-order factor *perceived need satisfaction*. We fixed covariances between the different factors representing unique variance to zero in order to ensure that the factors were perfectly orthogonal to each other. Our method therefore used a similar approach as relative weight analysis (Breland & Donovan, 2005; Johnson, 2000), which is used to approximate the differential impact of correlated predictors in multiple regressions. In a nutshell, relative weight analysis creates a new set of uncorrelated predictors, which are maximally correlated with the corresponding original predictors. In a second step, the criterion is regressed on the new predictors. The resulting standardized regression weights reflect the relative weight of the predictive variable and are thus combined with the original regression weights to assess the predictors' importance in the equation. In comparison to relative weight analysis, our method only accounts for unique variance and gives no information on the contribution of a variable to the shared variance of a predictor set. It should be noted that the specified paths will only reach significance if there are any associations beyond the shared influence of the predictors. This makes the method a conservative approach for testing the differential influence of exogenous variables.

### **3.3.2. Evaluation of model fit**

The model fit of all estimated structural equation models is reported according to the recommendation of Hu and Bentler (1999), using not only the  $\chi^2$ -test for model fit, but also a combination of certain misfit (*SRMR*, *RMSEA*) and fit indices (*CFI*). The suggested rules of thumb for cut-off values by Schermelleh-Engel, Moosbrugger, and Müller (2003) were applied to evaluate the goodness of fit of the conducted models. According to these

guidelines, we distinguished between an acceptable model fit ( $SRMR \leq .10$ ,  $RMSEA \leq .08$ ,  $CFI \geq .95$ ) and a good model fit ( $SRMR \leq .05$ ,  $RMSEA \leq .05$ ,  $CFI \geq .97$ ). Furthermore, Mplus delivers modification indices indicating possible reasons for model misfit. We used these indices to detect possible residual correlations between indicators of the latent variables. We freed such residual correlations when necessary in order to sustain a good model fit. We neither relocated indicators between latent variables, nor adjusted the hypothesized structural model. Therefore, we ensured a clear approach of deductive hypothesis testing.

## 4. Results

We will follow the aforementioned analysis steps to describe the results of our study. Therefore, we start with the preliminary analyses, followed by the structural equation modeling to test the assumed relationship between teachers' perceived need satisfaction and teachers' work-related learning goal orientation.

### 4.1. Preliminary analyses

The mean scores and standard deviations as well as the zero order correlations of all used scales are shown in Table 1. We first want to focus on the normality of the scales in question and then on their zero-order correlations for an initial view of the obtained data.

--- Insert Table 1 about here ---

#### 4.1.1. Univariate normality

The obtained scales significantly deviated from univariate normality ( $p < .001$  in all Kolmogorov–Smirnov tests). The most severe deviation was observed for the scale measuring teachers' work-related learning goal orientation ( $skewness = -1.14$ ). This shows that the teachers in our sample were more likely to report a high than a low work-related learning goal orientation, which is rather typical for the self-reported work-related learning goal orientation in samples of teachers (Author et al., 2011). Similar high skewness was observed for intrinsic work motivation ( $skewness = -1.10$ ). All items measuring intrinsic work motivation showed severe skewness with at least 96% of the participants choosing one of the upper three out of

five categories. This ceiling effect of intrinsic motivation indicates that the teachers in our sample reported to be mostly intrinsically motivated for their job. While their deviation from the normal distribution was still significant, the scales measuring perceived autonomy (*skewness* = -0.25), perceived competence (*skewness* = -0.64) and perceived relatedness (*skewness* = -0.70) deviated less strongly than the previously accounted scales. The observed pattern indicated that the assumption of multivariate normality had to be rejected. As a response, the maximum likelihood estimator with mean- and variance-adjusted chi-square test statistics (MLMV) was applied in the later conducted structural equation models, because it is superior to the standard maximum likelihood estimator (ML) in cases of non-normal data.

#### **4.1.2. Zero-order correlations**

A look at the zero-order correlations reveals that perceived autonomy, perceived competence and perceived relatedness positively correlate with teachers' work-related learning goal orientation. This provides a first hint at the importance of need satisfaction for teachers' work-related learning goal orientation. However, intrinsic work motivation was also associated with all other constructs. Hence, a mediation of the relationship between perceived need satisfaction and teachers' work-related learning goal orientation was still possible and had to be ruled out in the later analyses. The correlation matrix also shows collinearity between perceived autonomy, competence, and relatedness. It was expected that the collinearity between the predictors would increase when dealing with the constructs on a latent level due to the suppression of unsystematic variance. Therefore our preliminary analyses support the later applied approach to include a second order factor representing perceived need satisfaction to avoid problems of model misspecification outlined by Grewal et al. (2004).

#### **4.2. Structural Equation Modeling**

In the next step of our analyses, we conducted a simple model assessing the relationship between the second order factor "perceived need satisfaction" as predictor and work-related learning goal orientation as criterion. Our model achieved a good fit ( $\chi^2$  (23; n =

334) = 42.09,  $p < .001$ ,  $SRMR = .05$ ,  $RMSEA = .05$ ,  $CFI = .97$ ). The obtained modification indices suggested to free covariance between the three item parcels, reflecting dissatisfaction of the basic psychological needs. We freed the three residual correlations between the item parcels in question ( $r = .18 - .23$ ) to control for the remaining methodological invariance. Subsequently, the fit indices improved and the model fitted the data very well ( $\chi^2 (20; n = 334) = 27.37$ ,  $p = .251$ ,  $SRMR = .04$ ,  $RMSEA = .03$ ,  $CFI = .99$ ). The path coefficients are shown in Figure 1. The figure shows that the direct effect of perceived need satisfaction on teachers' work-related learning goal orientation occurred and proved to be quite substantial in our first simple model ( $R^2 = .20$ ). The obtained association between the two constructs points in a positive direction as predicted.

--- Insert Figure 1 about here ---

After the inclusion of intrinsic work motivation as a potential mediator of the relationship between perceived need satisfaction at work and teachers' work-related learning goal orientation, the model fit dropped ( $\chi^2 (75; n = 334) = 146.23$ ,  $p < .001$ ,  $SRMR = .06$ ,  $RMSEA = .05$ ,  $CFI = .92$ ). We then included two residual correlations ( $r = .30$  and  $r = -.21$ ) between items of the scale measuring intrinsic work motivation. This improved the model fit to an acceptable level ( $\chi^2 (73; n = 334) = 124.51$ ,  $p < .001$ ,  $SRMR = .06$ ,  $RMSEA = .05$ ,  $CFI = .94$ ). While this might still not be considered a good model fit, the fit statistics nevertheless suggests that it is acceptable to consider the path coefficients. As Figure 2 shows, perceived need satisfaction at work is predictive for intrinsic work motivation as well as work-related learning goal orientation. However, while the direct effect of intrinsic work motivation on work-related learning goal orientation did point in the right direction, it did not reach significance ( $\beta = .17$ ,  $p = .079$ ).

--- Insert Figure 2 about here ---

In the last step, we investigated the unique effects of perceived autonomy, competence and relatedness beyond their shared influence on teachers' work-related learning goal orientation. Therefore, we extracted the unique variance of the three predictors on a latent level and used the new variables representing the unique variance as predictors for teachers' work-related learning goal orientation (as described in section 3.3.1.). The model showed a very good fit to the data ( $\chi^2(25; n = 334) = 24.85, p = .471, SRMR = .04, RMSEA = .00, CFI = 1.00$ ). Figure 3 shows that perceived autonomy, perceived competence and perceived relatedness have differential predictive power regarding teachers' work-related learning goal orientation. All observed path coefficients were positive as expected. While the explained variance cannot easily be compared to the base model due to the suppression of variance, it is important to note that it reaches significance ( $R^2 = .68, p = .026$ ). Thus, the three predictors can individually account for a substantial amount of variance even when their shared variance is not included in the equation.

--- Insert Figure 3 about here ---

## 5. Discussion

In the presented study, we investigated the relationship between teachers' perceived need satisfaction at school and their work-related learning goal orientation. We were able to show that perceived need satisfaction at work is predictive for teachers' work-related learning goal orientation and explains a substantial amount of variance on that criterion. As expected, the path between the two variables pointed in a positive direction. This relationship was robust even after the inclusion of intrinsic work motivation as a possible mediator. Contrary to our expectations, no direct effect of intrinsic work motivation on teachers' work-related

learning goal orientation occurred. This lack of a direct effect is rather surprising because previous studies have often found an association between learning goal orientations and intrinsic motivation (Elliot & Church, 1997; Harackiewicz et al., 1997). In our opinion, two possible reasons might be responsible for the absence of the relationship. First of all, associations between intrinsic motivation and learning goal orientation found in previous studies could indeed reflect the shared influence of need satisfaction on both constructs. Therefore, the association would be a spurious correlation reflecting the influence of an unassessed variable. This explanation could be applicable for correlative research on the relationship between the two variables. However, it would not be applicable for experimental research. A second explanation could be that the variance reduction in teachers' intrinsic work motivation, which occurred because of strong ceiling effects, limited the detection of possible associations with teachers' work-related learning goal orientation. We think this explanation is very plausible and will discuss it in more detail later on (see section 5.3). Finally, we tested the independent influence of the perceived satisfaction for each of the three basic psychological needs at work by focusing on their unique variances. While this is a rather conservative approach, all three expected paths were significant and pointed in the expected positive direction. The results therefore highlight the possibility that the perceived satisfaction of each basic psychological need has a unique predictive value for teachers' work-related learning goal orientation.

Our results strongly support our assumption that perceived need satisfaction at work predicts teachers' work-related learning goal orientation. Therefore, we found first evidence that previous research linking students' learning goal orientation to need satisfying classroom structures (e.g., Ames, 1992; Meece et al., 2006) might be generalized to teachers' working environment. Just as learning goal orientation can be fostered in students, our study delivers first evidence on the possibility that teachers' work-related learning goal orientation might also be fostered by means of need support. Furthermore, the presented study is also a crucial

step towards an incorporation of achievement goal orientations into the theoretical framework of SDT.

### **5.1. A broader view on achievement goals**

From a theoretical point of view, the obtained results provide evidence for a new connection between the theoretical frameworks of Self-Determination-Theory and Achievement Goal Approach. It has been shown that perceived need satisfaction is not only important for the development of intrinsic motivation, but also closely associated to teachers' work-related learning goal orientation. Studies combining research on SDT and achievement goal orientations are relatively rare. This is rather surprising as the theoretical framework of SDT (especially Deci & Ryan, 2000 as well as Vansteenkiste et al., 2006) strongly emphasizes direct connections between perceived need satisfaction and goals that emphasize personal growth such as learning goals. Our research tested this theoretical assumption and provides empirical evidence that learning goals may be included in the theoretical framework of SDT as specific kinds of intrinsic goals that occur in achievement related environments.

Furthermore, we provide evidence that perceived competence, autonomy, and relatedness have a unique impact on the degree of teachers' work-related learning goal orientation beyond their shared influence. While the research on learning goals has often centered on the striving for competence (see Elliot, 2005), our results underline the possibility that the striving for autonomy and relatedness may also play crucial roles in the development of a learning goal orientation. This also underlines the importance to look beyond competence related variables like self-efficacy and fear of failure when investigating possible antecedents of achievement goal orientations and, more specifically, learning goal orientations. Beyond the theoretical implications, our study also provides some important practical implications regarding workplace interventions and ongoing debates on teaching and teacher education.

## **5.2. Practical implications for teachers' working environment**

As stated, the provided results suggest that teachers' work-related learning goal orientation might be enhanced by focusing on the satisfaction of their basic psychological needs in their work environment. There are multiple ways to achieve this: For instance, previous studies have shown that providing meaningful freedom of choice can enhance autonomy (Agran, Storey, & Krupp, 2010; Katz & Assor, 2007). In teachers' work environment, autonomy support can be implemented by encouraging teachers to decide which voluntary training courses they want to join in order to enhance their teaching skills. Perceived competence can be supported by offering feedback on one's skill development (Vallerand & Reid, 1984). Feedback procedures can be applied in school by establishing peer-to-peer-evaluations, which also addresses the need for relatedness. Moreover, relatedness can be addressed by fostering teamwork (Turner, Barling, & Zacharatos, 2002) and a positive social climate. Future research should investigate if the described strategies support both need satisfaction in younger teachers as well as the maintenance of perceived need satisfaction. This is important because previous research has shown that older teachers report a lower degree of need satisfaction compared to younger colleagues (Evelein, Korthagen, & Brekelmans, 2008).

Beyond implications for workplace interventions, our research also has some pressing implications for current international debates on education. For example, most Western countries have implemented methods of quality control in their education systems, which often include assessing the performance of students. These assessments differ in the way their results are reported to the responsible teachers (OECD, 2013). Usually, norm- or criterion-based class results are delivered. However, not all reports include guidelines that help to counter problematic results by means of teaching or classroom management. A combination of negative test results and this lack of guidelines might decrease teachers' sense of competence and, subsequently, their work-related learning goal orientation. Hence,

performance evaluations should include supportive guidelines to reduce these anticipated negative effects on teachers' motivation.

Another example for implications of our research is the debate on the implementation of standardized teaching procedures, such as scripted curricula, which is particularly topical in the USA at present. The critics of standardized or scripted teaching often point out that it might conflict with teachers' capability to address the individual learning progress and interests of their students (Dresser, 2012). Besides this possible negative aspect of scripted teaching, it could also reduce teachers' perception of autonomy at work and, in turn, reduce their work-related learning goal orientation. Therefore, another downside of scripted teaching could be its negative impact on teachers' motivation.

Addressing the issues arising in the ongoing educational debate in a way that takes need satisfaction into account could lead to an increase in teachers' work-related learning goal orientation. Eventually, this should also result in the previously described positive effects on their well-being and engagement in professional development. However, while we are convinced of the importance of our results, we have to address some limitations of our study. The discussion of these limitations may help to shape future research on the relationship between need satisfaction and teachers' work-related learning goal orientation.

### **5.3. Limitations of the study**

One limitation of the results lies in the restricted range of intrinsic work motivation in our sample. A strong ceiling effect concerning intrinsic work motivation occurred, which means that we reached a highly motivated sample of teachers. This ceiling effect might be the reason for the insignificant direct effect on teachers' work-related learning goal orientation as well as for the substantial decrease of the model fit after the inclusion of intrinsic work motivation. The observed ceiling effects might be explained by the fact that we distributed our questionnaires via newsgroups and mailing lists for teachers. This distributional method as well as the voluntary nature of participation makes it very likely that our sample does not

represent the normal range of teachers' work motivation. We used a wide array of different newsgroups and mailing lists, which were primarily administered by practicing teachers and not by scientists. Therefore we cannot provide our response rate (due to lack of information on the size of the different channels) nor can we compare respondents and non-respondents. However, as represented in the data, we have to assume that mainly highly motivated teachers participated in our assessment. This limits the variance of intrinsic work motivation in our sample and its explanatory value regarding the association between perceived need satisfaction and teachers' work-related learning goal orientation. Thus, our results are probably a conservative estimation of a potential mediating effect by teachers' intrinsic work motivation.

Furthermore, we solely used self-report measures in our study. Self-report measures do not necessarily solely assess how need supportive the working environment of teachers actually is, but rather how supportive it is perceived to be by the individual. Nevertheless, research has shown that the perception of need satisfaction does not only depend on environmental influences (Evelein et al., 2008; Levesque, Zuehlke, Stanek, & Ryan, 2004) but on personality as well (Deci & Ryan, 1985, 1991). Therefore, the described analyses cannot be considered perfectly accurate for the described working conditions. However, it is also unlikely that they only reflect aspects of the personality of the questioned participant. The best way to interpret the results might be to view perceived need satisfaction of teachers as a subjectively biased approximation of need support in their actual working environment. Thus, it is likely that the observed association between perceived need satisfaction and teachers' work-related learning goal orientation is at least partly grounded in the environment. However, the estimated effect sizes might not be entirely accurate for the relationship between actual need support in the working environment and teachers' work-related learning goal orientation.

Another limitation of the results is that, even though our theoretically well-established model shows a good fit to the data, it cannot deliver final proof for the assumed causal mechanism that perceived need satisfaction at work indeed influences teachers' work-related learning goal orientation. This is due to the fact that the analyses are grounded in data from a survey with only one measurement point. While our analyses suggest an association between perceived need satisfaction at work and work-related learning goal orientation, it is possible that learning goal-oriented teachers perceive more possibilities to satisfy their basic psychological needs at work. However, as carefully addressed in our literature review, previous research supports the view that perceived need satisfaction has to be considered an antecedent rather than a consequence for variables indicating human motivation (in general: Deci & Ryan, 2000; additional examples for perceived competence: Senko & Harackiewicz, 2005; for perceived autonomy: Vansteenkiste et al., 2004; for perceived relatedness: Jamieson et al., 2010; Lustenberger & Jagacinski, 2010). The theoretical background from SDT and the Achievement Goal Approach make the assumed causal mechanism (that perceived need satisfaction at work strengthens teachers' work-related learning goal orientation) more plausible than the reverse.

#### **5.4. Future directions**

Our research is a first step toward a broad understanding of environmental antecedents for domain-specific learning goal orientations. While this study focused on teachers and their working conditions, the pattern of results should be replicated in other educational contexts (e.g., institutions of primary, secondary and higher education) to investigate its generalizability. If the results of our study can be replicated in other domains, a generalized model on environmental antecedents of learning goal orientations might expand the theoretical network of SDT. This theoretical expansion would be very helpful to establish new environment-centered interventions aiming at the enhancement of domain-specific learning goal orientations in a broad set of educational environments. Furthermore, the underlying

causation should be investigated with experimental or longitudinal designs, which could also include objective measures of the working context.

In teacher' motivation research, longitudinal data would be necessary to explore the role of perceived need satisfaction in the development of a work-related learning goal orientation. For now, we can only state that perceived need satisfaction at work and teachers' work-related learning goal orientation are associated. However, SDT researchers often postulate that need satisfaction is the breeding ground for variables reflecting human motivation (Deci & Ryan, 2000). Therefore, we assume that perceived need satisfaction in teachers' work environment triggers the development of a work-related learning goal orientation. This assumption that should be tested in future research.

## **6. Conclusion**

The present research provides new insights into the importance of perceived need satisfaction at teachers' workplace and might inspire new ideas to foster teachers' work-related learning goal orientation. Consequently, these ideas should be put into practice by implementing and subsequently testing workplace modifications aimed at teachers' basic psychological needs for autonomy, competence, and relatedness. For the time being, we can conclude that our results are of utmost importance for current debates on educational programs. This is especially true when educational programs include the introduction of new teaching techniques. Such programs rely on teachers' willingness to invest time in professional development (in other words, on their work-related learning goal orientation). The observed relationship between need satisfaction and teachers' work-related learning goal orientation makes it likely that efforts to motivate teachers to engage in professional development will fail when teachers' basic psychological needs are not considered or are even thwarted. Therefore, we advise to consider the importance of school as a workplace and teachers' inherent striving to satisfy the needs for autonomy, competence, and relatedness in current scientific and political debates on educational programs.

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## Footnotes

[Footnote 1]: German students are assigned to one of the three possible secondary tracks of the German school system after fourth class.

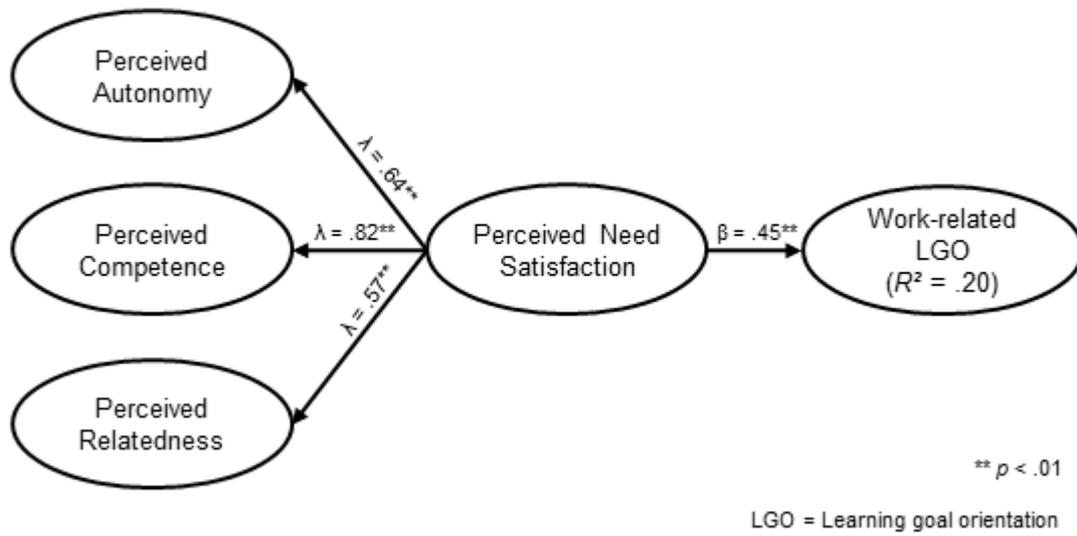
[Footnote 2]: The following validity coefficients were obtained between the corresponding subscales of the BPNS and the BPMN: perceived autonomy:  $r = .85$ , perceived competence:  $r = .67$ , perceived relatedness:  $r = .86$

[Footnote 3]: There are no strict guidelines on the evaluation of reliability by means of internal consistency as this measure depends on the reliability of the measurement as well as the homogeneity of the depicted construct. However, we used the often applied rules of thumb by Cicchetti (1994), which defined the cut-off for an acceptable reliability at  $\alpha \geq .70$  and for a good reliability at  $\alpha \geq .80$ .

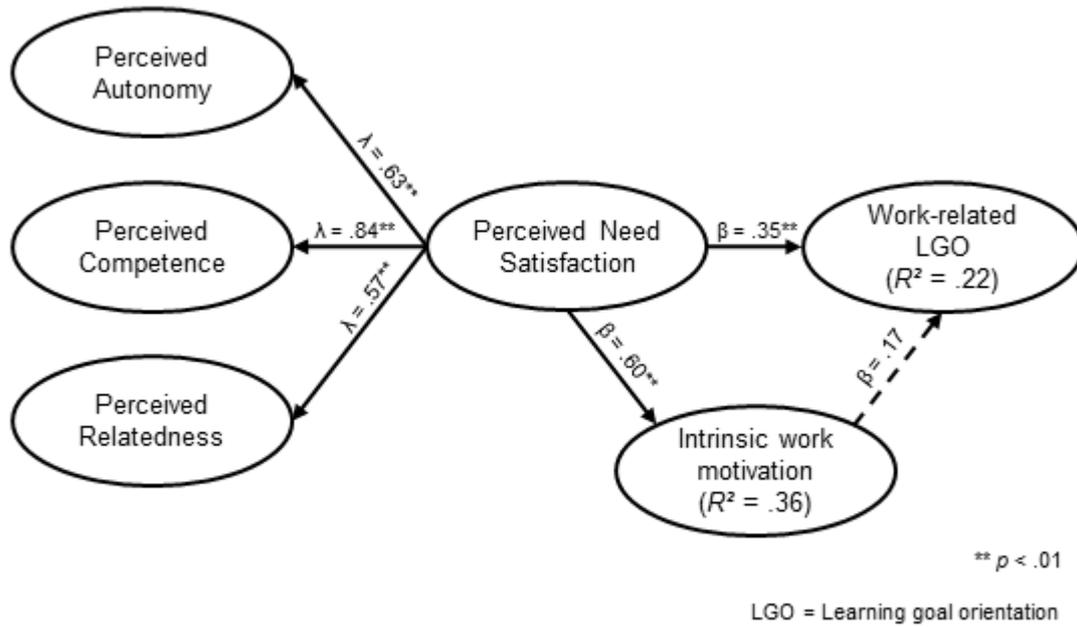
**Table 1**Zero order correlations, Descriptives and internal consistencies (Cronbachs  $\alpha$ )

	<i>M</i>	<i>SD</i>	$\alpha$	(1)	(2)	(3)	(4)
(1) Perceived autonomy	3.19	0.64	.78				
(2) Perceived competence	3.85	0.55	.77	.40**			
(3) Perceived relatedness	3.95	0.68	.78	.35**	.33**		
(4) Work related learning goal orientation	5.99 <sup>a</sup>	0.77	.88	.19**	.21**	.16**	
(5) Intrinsic work motivation	4.40	0.56	.79	.33**	.44**	.32**	.33**

\*\*  $p < .01$ <sup>a</sup> While all other scales had a range from 1 to 5, teachers' learning goal orientation at work was assessed using a 7-point Likert-Scale



*Figure 1.* Base Model reflecting the relationship between perceived need satisfaction at work and teachers' work-related learning goal orientation. The loadings of the item parcels on the latent factors are excluded for better comprehensibility. The range of the factor loadings lies between  $\lambda = .54$  to  $\lambda = .98$ . All factor loadings are highly significant.



*Figure 2.* Model accounting for the potential influence of intrinsic work motivation on the criterion. The loadings of the items and item parcels on the latent factors are excluded for better comprehensibility. The range of the factor loadings lies between  $\lambda = .54$  to  $\lambda = .98$ . All factor loadings are highly significant.

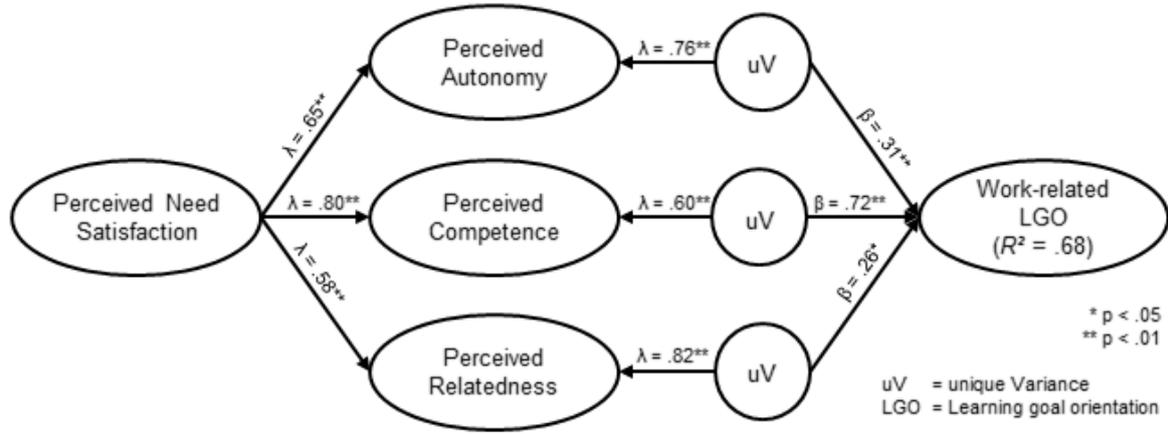


Figure 3. Model accounting for unique variance of the exogenous variables. Loadings of the item parcels on the latent factors are identical to the base model.

Deconstructing Performance Goal Orientations:  
The Merit of a Dimensional Approach

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**Abstract**

Achievement goal research often differentiates performance approach from performance avoidance goal orientations. On a conceptual level, both performance goal orientations are supposedly founded in a shared normative evaluation standard, and two diverging goal valence dimensions (approach/avoidance). The aim of this article is to put this dimensional model to the test. In a first cross-sectional study ( $n = 321$  pre-service teachers), we extracted all three underlying dimensions from items measuring performance goal orientations and successfully validated them with corresponding dispositional constructs (reference norm, regulatory focus). In a second longitudinal study ( $n = 1290$  secondary school students), we showed that the extracted dimensions are meaningfully associated with antecedents (perceived competence, perceived competitiveness) and consequences (performance anxiety, interest) of performance goal orientations. The result pattern of both studies shows that a dimensional approach can explain the characteristic associations of performance goal orientations to antecedents and outcome variables as well as their interdependence.

*Keywords:* performance goal orientations, goal valence, evaluation standard, approach, avoidance

## Deconstructing Performance Goal Orientations: The Merit of a Dimensional Approach

### 1. Introduction

Achievement goal approach is one of the most influential theories in the field of achievement motivation. Researchers within this theoretical framework have investigated human goal striving in achievement domains like sports (Duda, 2005) and schools as places for learning (Meece, Anderman, & Anderman, 2006) or working environments (Butler, 2007; Retelsdorf, Butler, Streblow, & Schiefele, 2010). The theory distinguishes the striving for qualitatively different goals into performance goal orientation (striving for competence demonstration) and learning goal or mastery goal orientation (striving for competence development), which can both be subsumed as classes of achievement goal orientations (Dweck & Leggett, 1988; Elliot, 2005). The majority of research (e.g., Elliot, 1999; Elliot & Harackiewicz, 1996) further distinguishes performance goal orientations into performance approach goal orientation (striving to demonstrate high competencies) and performance avoidance goal orientation (striving to cover the lack of own competencies). This distinction was originally introduced to explain differential associations of performance goal orientations to pattern of learning: A performance approach goal orientation was meant to facilitate adaptive patterns of learning (indicated by intrinsic task motivation and deep learning strategies), while a performance avoidance goal orientation was meant to be more maladaptive (Elliot & Church, 1997; Elliot & Harackiewicz, 1996; Graham & Golan, 1991). Researchers found some empirical proof for the maladaptive nature of a performance avoidance goal orientation (e.g., positive associations with performance anxiety and negative associations with intrinsic motivation, see Elliot & Harackiewicz, 1996; Elliot & McGregor, 1999). Empirical findings regarding a performance approach goal orientation, however, were more complex: Some studies showed positive associations to achievement or persistence (Elliot & Church, 1997; Harackiewicz, Barron, Carter, Lehto, & Elliot, 1997), while other studies showed associations to rather maladaptive learning strategies (e.g. surface learning,

Elliot, McGregor, & Gable, 1999; Ryan & Pintrich, 1997). With these findings in mind, critics questioned the necessity of the dichotomization of performance goal orientations and argued that other approaches like multi-goal perspectives<sup>1</sup> could better explain the complex associations of performance goal orientations with patterns of learning (Midgley et al., 2001). Some researchers even questioned the ability of individuals to differentiate between both performance goal orientations in daily life situations (Urda & Mestas, 2006). Children in particular did not seem to differentiate between performance approach and performance avoidance goal orientations (Bong, 2009; Bong, Woo, & Shin, 2013) and, even within adults, the observed associations between them were considerably high (often larger than  $r = .50$  according to Murayama, Elliot, & Yamagata, 2011). However, most achievement goal researchers still insist on the importance of the dichotomization of performance goal orientations, especially because a performance avoidance goal orientation yields stronger negative results than a performance approach goal orientation (Murayama et al., 2011).

We think that this paradox within achievement goal research (high associations between performance goal orientations, partially different outcome patterns) can be resolved by focusing on the dimensions behind performance goal orientations as especially highlighted by Elliot and McGregor (2001): While both performance goal orientations might be characterized by the same normative *evaluation standard* (i.e., own competencies are assessed by comparing one's achievement within a reference group; Elliot, McGregor, & Thrash, 2002), they are meant to differ in their *goal valence* by either focusing on accomplishment of positive outcomes (approach goal valence) or prevention of negative outcomes (avoidance

<sup>1</sup> The multi-goal perspective postulates that different combinations of achievement goal orientations might lead to differential outcome patterns. Midgley, Kaplan, and Middleton (2001) stated, for instance, that a strong performance goal orientation would only lead to positive patterns of learning when it is accompanied by a strong learning goal orientation.

goal valence; see Elliot, 1999; Elliot & Harackiewicz, 1996). Normative evaluation standard and goal valences as goal underlying dimensions are suitable to explain the interdependence of both performance goal orientations (based on the shared normative evaluation standard) as well as their differential effects on some outcome variables (based on the respective goal valence). Although the described dimensional model is neither our invention nor new to achievement goal research, empirical evidence on the validity of the dimensional foundation of performance goal orientations is lacking. We intend to provide this crucial empirical evidence by extracting the postulated goal underlying dimensions from items measuring performance goal orientations with latent bifactor models. Furthermore, we want to demonstrate that goal underlying dimensions are indeed suitable to explain the complex association pattern as well as inter- and independence of performance goal orientations.

## **2. Testing the Dimensional Nature of Performance Goal Orientations**

In order to understand why we need to put the foundation of performance goal orientations to the test, we first have to address how assumptions of dimensional models of performance goal orientations have been tested by empirical research in the past. The claim that performance goal orientations are characterized by a normative evaluation standard as well as two diverging goal valence dimensions was explicitly issued by Elliot and McGregor (2001) and has been repeated by achievement goal theorists on regular bases ever since (for contemporary examples, see Elliot, Murayama, & Pekrun, 2011; Murayama et al., 2011; Vansteenkiste, Lens, Elliot, Soenens, & Mouratidis, 2014). We would even say that the dimensional nature of achievement goal orientations became one of the core tenets of achievement goal approach in the course of the last two decades of research. Considering the growing popularity of dimensional models (Elliot et al., 2011) and the key relevance of goal underlying dimensions, one could expect that the existence of goal underlying dimensions would be an empirically fortified fact for the time being. At least, we would expect some empirical evidence for the existence of goal underlying dimensions within performance goal

orientations since the introduction of goal valence in the conceptualization of performance goal orientations sparked the discussion about goal underlying dimensions. Therefore, it is rather remarkable that almost no research has actually empirically addressed the mere existence of goal underlying dimensions.

More specifically, research most often tried to validate dimensional models by extracting the appropriate number of achievement goal orientation instances (i.e., compounds of goal underlying dimensions) rather than accounting for the postulated dimensional structure. When considering the dimensional model of performance goal orientations, most research work actually tested whether performance approach goal orientations and performance avoidance goal orientations can be differentiated from each other (Day, Radosevich, & Chasteen, 2003; Midgley et al., 1998; Murayama et al., 2011; VandeWalle, 1997). The empirical evidence on this question has then often been interpreted as evidence for the core assumption that performance goal orientations are heterogeneous constructs founded in a normative evaluation standard but diverging goal valence (Murayama et al., 2011). However, there is no clear logical connection between the mere existence of two clearly separable constructs and the question which dimensions actually constitute the founding fabric of these constructs.

To our knowledge, only one study takes goal underlying dimensions into consideration while validating an achievement goal measure: Elliot and Murayama (2008) modeled goal underlying dimensions as second-order factors to support their assumption that first-order factors extracted from the items of their revised Achievement Goal Questionnaire (AGQ-R) can be understood as compounds of goal valence (approach and avoidance) and evaluation standard (normative and intrapersonal). The results of their analyses showed that second-order factors are extractable in a way that could indeed support a dimensional model of achievement goals. However, the authors did not provide any additional evidence for the construct validity of the second-order factors. Thus, one can solely draw the conclusion that

performance goal orientations are actually heterogeneous constructs founded in two underlying dimensions without knowing whether these dimensions actually resemble a normative evaluation standard and diverging goal valence as issued by Elliot and McGregor (2001). The authors of the study in question neither provide a validation via external criteria, nor do they show that previous research can be explained under consideration of these second-order factors. Instead, Elliot and Murayama (2008) once again use the first-order factors to account for the construct validity of their measure.

Moreover, we think that the extraction of goal relevant dimensions as second-order factors (as done by Elliot & Murayama, 2008) might not represent the best way to account for the supposed dimensionality of performance goal orientations. A more direct way would be to use bifactor models (Chen, Hayes, Carver, Laurenceau, & Zhang, 2012), since these models are suitable to answer the question of whether each item that measures performance goal orientations actually reflects two dimensions (normative evaluation standard as well as approach or avoidance goal valence). In the past decade, the use of such bifactor models has brought new insights to individual differences in constructs like intelligence (Valerius & Sparfeldt, 2014), the academic self-concept (Brunner et al., 2010) and well-being (Chen, West, & Sousa, 2006). In *figure 1*, we provide a graphical representation of a bifactor model applied to items measuring performance goal orientations in comparison to more classical factor analytic models reflecting the univariate and dichotomous approach to performance goal orientations.

--- Insert Figure 1 about here ---

### **3. Further Elaborations on Goal Underlying Dimensions**

The application of bifactor models within achievement goal research is not just a switch in methodology within achievement goal approach. It also offers new possibilities for

investigating the relevance of goal underlying dimensions. In other words, we can test whether the dimensional foundation of performance goal orientations is in fact responsible for converging and diverging association patterns of performance approach and performance avoidance goal orientations, which is a central tenet of achievement goal research (Elliot & McGregor, 2001). On a related note, the consequent investigation of bifactor models in different age groups also allows us to draw reliable conclusions on the comparability of the dimensional foundation in different developmental stages which has been a concern for fellow researchers (Bong, 2009; Bong et al., 2013). In order to provide empirical evidence on the assumed dimensional nature of performance goal orientations, we need to form clear hypotheses on relationships between goal underlying dimensions and other variables. Thus, we have to elaborate further on the dimensions themselves as well as on possible antecedents and their consequences. We start this in depth elaboration with the one dimension that is likely to be responsible for high associations between both performance goal orientations: their normative evaluation standard.

### **3.1 Evaluation Standard of Performance Goal Orientations**

Evaluation standards were first addressed by Rheinberg and colleagues, who labeled them *reference norm orientations* (Rheinberg, 1983). Similar to the definition of evaluation standards applied by Elliot and McGregor (2001), reference norm orientations are defined as individuals' preferences for certain comparison standards to evaluate the achievement of others (especially within teachers judging students' achievement, see Mischo & Rheinberg, 1995; Rheinberg, 1983) and themselves (O. Dickhäuser & Rheinberg, 2003). Thereby, a social *reference norm orientation* essentially describes a normative evaluation standard and, thus, indicates that current achievement is compared interpersonally within a specific reference group (O. Dickhäuser & Rheinberg, 2003). The conceptual familiarity between the reliance on a social reference norm orientation and the adoption of a performance goal orientation has been stressed by researchers who investigated reference norm orientations in the past (e.g., O.

Dickhäuser & Rheinberg, 2003). Moreover, Schöne, Dickhäuser, Spinath, and Stiensmeier-Pelster (2004) empirically investigated the relationship between reference norm orientations and achievement goal orientations in six different samples (including students in primary as well as secondary education and university students). Schöne and colleagues (2004) found that performance approach and performance avoidance goal orientations were both positively associated with a social reference norm orientation and these associations showed a comparable size (correlations ranged from  $r = .24$  to  $r = .57$  depending on the sample).

While the research on reference norm orientations is rarely considered in the international literature on achievement goal orientations - mainly because it was almost exclusively published in German - the empirical findings within this approach strengthen the assumption that both performance goal orientations are characterized by the same normative evaluation standard as pointed out by Elliot and McGregor (2001). Thus, antecedents and consequences that are commonly associated with both performance goal orientations could be a result of their shared normative evaluation standard. This makes the perception of competition within the learning environment an especially possible antecedent of a normative evaluation standard.

### **3.1.1 Perceived Competitiveness as Antecedent of a Normative Evaluation Standard**

Situations that emphasize competition clearly stress the need to outperform others and could, thus, facilitate a normative evaluation standard within the individual. In line with this argumentation, empirical findings show that a competitive class climate predicts the adoption of both performance goal orientations by students (Meece et al., 2006; Wolters, 2004). These findings are supplemented with the results of experimental research that successfully induced performance goals by emphasizing competition between participants (e.g., C. Dickhäuser, Buch, & Dickhäuser, 2011; Elliot & Harackiewicz, 1996; Elliott & Dweck, 1988). Hence, we can assume that the normative evaluation standard of performance approach and performance

avoidance goal orientations should be more likely to emerge in a climate that emphasizes strong competition than in a more collaborative social climate. Furthermore, a normative evaluation standard in a seemingly competitive situation might also induce performance anxiety, a typical outcome of both performance goal orientations.

### **3.1.2 Performance Anxiety as Consequence of a Normative Evaluation Standard**

A meta-analysis by Huang (2011) showed that both performance goal orientations are linked to performance anxiety. This shared relationship could be based in the underlying normative evaluation standard. We assume that the possibility of failure is very salient to individuals adopting a normative evaluation standard when compared to individuals adopting an intrapersonal evaluation standard (evaluation of own achievement by comparing it with own prior achievement) because in the former case failure is not completely under individuals' control (as is also depends on the achievement of others). The resulting loss of control and higher accessibility of failure could induce anxiety over being outperformed by others. In fact, research has shown that fear of failure in particular is associated with both performance goal orientations (Dinger, Dickhäuser, Spinath, & Steinmayr, 2013; Elliot & Church, 1997). This leads us to the assumption that the more individuals adopt a normative evaluation standard, the more likely they are to perceive possibilities to fail in their task and as a result experience performance anxiety. Furthermore, we assume that this effect becomes even stronger as the strength of the adopted avoidance goal valence increases, which we will elaborate on in the next section.

## **3.2 Goal Valence of Performance Goal Orientations**

The differentiation of achievement motivation in terms of an avoidance versus approach focus is related to very early research on human motivation, most notably early drive theories (Hull, 1943), which differentiated between appetitive drives (i.e., stimuli like food or water that facilitate approaching behavior within the organism) and aversive drives (i.e., stimuli like pain from electric shocks that facilitate avoidance behavior within the

organism). Other examples for conceptualizations of approach versus avoidance motivation can be found in biologically grounded personality theories (e.g., Eysenck, 1967; Gray, 1990) and more recently in regulatory fit theory by Higgins (1997) that differentiates between a promotion and a prevention focus.

It seems plausible that more general dispositional tendencies like promotion and prevention focus might predict the more situation specific goal valence of performance goal orientations. In fact, some research ties performance approach and performance avoidance goal orientations to general approach versus avoidance tendencies (Bjørnebekk & Diseth, 2010; Elliot & Thrash, 2002). While both performance goal orientations proved to be related to the corresponding behavioral tendency in these studies, performance approach goal orientation also showed positive associations to avoidance tendencies. This result pattern might be explainable by the fact that negative emotionality and, thus, fear of failure was often used as a contributing indicator for avoidance tendencies. Hence, the positive association between performance approach goals and avoidance tendencies might be a result of the underlying association between a normative evaluation standard and fear of failure. We assume that extracting both goal valence dimensions in a bifactor model would allow us to show a clearer association between approach goal valence and approach tendencies, while no associations to avoidance tendencies should occur. Furthermore, we suggest that motivational variables (like promotion and prevention focus as suggested by Higgins, 1998) rather than affective variables like fear of failure should be used as proxies for approach and avoidance tendencies. Results linking these motivational variables to goal valence would strengthen the assumption that the somewhat controversial findings on the relationship between performance approach goal orientation and avoidance tendencies indeed reflect the complex dimensional nature of performance goal orientations. Moreover, we think that goal valence could explain the diverging relationships of performance goal orientations to perceived competence support.

### **3.2.1 Perceived Competence Support as Antecedent of Goal Valence**

In experimental research on achievement goals, a performance approach goal orientation is often differentially induced by highlighting the possibility of success, while a performance avoidance goal orientation is induced by highlighting the possibility of failure in task descriptions (C. Dickhäuser et al., 2011; Elliot & Harackiewicz, 1996). These experimental procedures match the empirical finding that competence expectations are positively associated to a performance approach goal orientation and negatively to a performance avoidance goal orientation (Elliot & Church, 1997). We think that highlighting personal capability leads to approach motivation since the individual might find positive outcomes more attainable. In contrast, highlighting personal incapability should lead to avoidance motivation since it highlights the possibility of personal failure. Thus, we assume that the strength of perceived competence support in a given achievement situation can effectively influence the strength of the goal valence dimensions. In more detail, we presume that perceived competence support (i.e., highlighting the possibility to succeed) enhances the strength of approach goal valence and suppresses the strength of avoidance goal valence. While this makes perceived competence support an important antecedent of goal valence dimensions, we also assume that they are differentially associated with typical consequences of achievement goal orientations like performance anxiety, intrinsic motivation and performance.

### **3.2.2 Consequences of Goal Valence**

Even though we have argued that performance anxiety might be associated with a normative evaluation standard, we assume that it is also associated with an avoidance goal valence. This would at least effectively explain why the association between performance anxiety and a performance avoidance goal orientation is closer than its association to a performance approach goal orientation (Huang, 2011). Elliot and McGregor (1999), in particular, found a strong association between a performance avoidance goal orientation and

the worry component of state performance anxiety. This association could very likely reflect the maladaptive influence of an avoidance goal valence: We presume that the avoidance goal valence constantly highlights the possibility of failure that needs to be prevented, subsequently leads to worries and in the long run to an increase in performance anxiety. Furthermore, we assume that typically observed negative associations between performance avoidance goal orientation and intrinsic motivation (Elliot & Church, 1997; Elliot & Harackiewicz, 1996) also reflect the impact of avoidance goal valence. This assumption is in line with Elliot and Harackiewicz (1996), who argued that inherent threats to the basic human need for competence fuel avoidance tendencies that subsequently impair intrinsic motivation (also in line with Self-Determination Theory, see Deci & Ryan, 1985; Deci & Ryan, 2000). Lastly, the goal valence dimensions ought to be differentially linked to actual performance. While a performance approach goal orientation has sometimes been shown to be positively associated with (graded) performance, a performance avoidance goal orientation was negatively related to this outcome variable in most cases (Elliot & Church, 1997; Elliot & McGregor, 1999; Elliot et al., 1999). We assume that the more individuals endorse an approach goal valence, the more they might also undertake efforts to acquire success, whereas the more individuals endorse an avoidance goal valence, the stronger their concerns about the possibility of failure become, which might lead to less adaptive learning strategies as shown by Elliot and colleagues (1999).

#### **4. Research Questions**

In the last sections we explained how goal underlying dimensions can be tied to previous research on performance goal orientations. Thereby, we have shown that the dimensional model of performance goal orientations can be used (and in fact has been used) to explain past findings within achievement goal research but has not been accordingly validated through empirical research. In the following two-staged process we aimed to

provide the necessary empirical evidence on the existence of goal underlying dimensions within performance goal orientations and on their validity:

In the first stage (study 1), we isolated independent goal relevant dimensions from items measuring performance approach or performance avoidance goal orientations in a bifactor model. Within this model, one factor represents the normative evaluation standard and two factors represent (approach or avoidance) goal valence. We address the construct clarity of the extracted factors by linking them to conceptually similar motivational constructs (social reference norm orientation, promotion & prevention focus). The first stage can therefore be subsumed under the two essential research questions whether the often proclaimed dimensional structure actually exists within performance goal orientations and whether the extracted goal underlying dimensions actually resemble aspects of goal valence as well as a normative evaluation standard as postulated by achievement goal researchers (Elliot & McGregor, 2001; Elliot et al., 2011). During the second stage (study 2), we investigated the criterial validity of the extracted goal underlying dimensions by relating them to possible antecedents (perceived competence support, perceived competitiveness) and consequences (interest, performance anxiety, graded performance). The second stage could accordingly be subsumed under the research question whether goal underlying dimension can sufficiently explain diverging as well as converging association patterns of performance goal orientations with external criteria.

The ultimate goal of both studies is to address the fabric of performance goal orientations. While previous research has often solely focused on the mere separation of performance approach from performance avoidance goal orientations, we want to explain which dimensions actually distinguish these achievement goal orientations and which dimension is responsible for their communality. This is important since it explains why we not solely focus on goal valence as the possible explanation for the distinctiveness of performance goal orientations but also on the rarely addressed normative evaluation standard. Thereby, we

hope that empirical evidence on both dimensions can simultaneously explain why performance goal orientations are differentially associated to some learning related constructs, while sharing strong correlations with each other and other learning related constructs.

Arguably, it would be possible to address all presented problems within a single sample and, thus, a one-stage process. However, we find that a two-staged process has stronger implications regarding the generalizability of the dimensional model to different achievement related contexts and age groups. Thus, we decided to conduct a two-staged process in two different populations (university and school students). Moreover, the acquired samples are of different age groups and we can, thus, investigate whether the dimensional structure can be generalized to different developmental stages (childhood, adulthood). This is of special importance since previous research indicates that individuals in diverging developmental stages might also differ in their personal conception of performance goal orientations with children presumably having difficulties to distinguish performance goals alongside their goal valence dimension (Bong et al., 2013). The whole analytic process is depicted in *figure 2*. This figure shows the postulated measurement model that was investigated in both conducted studies. Furthermore, it gives a quick overview on the postulated structural models that were tested within our two consecutive studies.

--- Insert Figure 2 about here ---

## 5. Study 1

In our first study we wanted to identify and validate goal underlying dimensions that constitute performance goal orientations. Thereby, we aimed to extract a shared normative evaluation standard and two diverging goal valence dimensions from items measuring performance goal orientations. In order to investigate whether the extracted factors actually resemble the postulated goal underlying dimensions, we validated them on conceptually

similar motivational dispositions: We expected a social reference norm orientation to predict the normative evaluation standard since both constructs share a large degree of conceptual similarities (i.e., a preference for social comparison when evaluating own achievement). Furthermore, a promotion focus should positively predict the approach goal valence dimension. This assumption is made because both constructs reflect approach tendencies and should have ties to the behavioral activation system. In contrast, we expect a prevention focus to positively predict the avoidance goal valence dimension. The investigated measurement model as well as the postulated structural model are depicted in *figure 2*.

## 5.1 Method

### 5.1.1 Sample

We questioned 321 German university students using an online survey (86.3% female, mean age of 21.2 years;  $SD = 3.5$  years). All participants were enrolled as pre-service teachers and had studied for three semesters on average ( $SD = 2.4$  semesters). The survey was distributed via online newsgroups and mailing lists. Participants were assured that their responses would remain confidential and would be used for scientific purposes only. Among all participants, 10 vouchers worth 10 Euro for a well-known online marketplace were raffled.

### 5.1.2 Measures

*Performance goal orientation* items were derived from a German self-report questionnaire (“Skalen zur Erfassung der Lern- und Leistungsmotivation”; SELLMO; Spinath, Stiensmeier-Pelster, Schöne, & Dickhäuser, 2002). This inventory has been well validated in samples of students in secondary education as well as university students (Spinath et al., 2002). Moreover, it is very commonly used within studies in German populations (e.g. Dinger et al., 2013; Schwinger & Stiensmeier-Pelster, 2011; Spinath & Steinmayr, 2012). Our short version of the scale consisted of four items measuring performance approach goal orientation ( $\alpha = .71$ ) as well as four items measuring performance avoidance goal orientation ( $\alpha = .90$ ). A sample item measuring performance approach goal orientation is “At university,

it is my goal to show that I am good at something.” Furthermore, the performance avoidance goal orientation was measured with items like ”At university, it is my goal to conceal if I know less than others.” A complete list of items is depicted in the appendix.

The *social reference norm orientation regarding own achievement* was assessed with an established German questionnaire (O. Dickhäuser & Rheinberg, 2003) consisting of four items ( $\alpha = .75$ ). A sample item for this scale is “When I speak of a good performance, I actually mean a result that is above average compared to the results of my fellow students”.

The *regulatory focus* was assessed with a German short version of the General Regulatory Focus Measure (Lockwood, Jordan, & Kunda, 2002) developed by Greifeneder and Keller (2012). This measure consists of two subscales (prevention versus promotion focus) with three items each, which have proven to be good proxies for approach and avoidance tendencies (Summerville & Roese, 2008). The subscale for promotion focus ( $\alpha = .72$ ) consisted of items like “I typically focus on the success I hope to achieve in the future.” Prevention focus ( $\alpha = .70$ ) was measured with items like “I frequently think about how I can prevent failures in my life.”

The items of all aforementioned scales were measured with a Likert-type scale ranging from 1 (*total disagreement*) to 7 (*total agreement*).

### **5.1.3 Analyses**

We used Mplus Version 7.1 (Muthén & Muthén, 1998-2012) for all subsequent analyses in which we utilized the robust maximum likelihood estimator (MLR). At first, we computed a confirmatory factor analysis to test the postulated bifactor model. We modeled one factor indicating the normative evaluation standard with loadings from all 8 items of the performance goal orientation measure. Additionally, we modeled two factors supposed to reflect the goal valence dimensions. Thereby, we freed loadings from the four items measuring a performance approach goal orientation on the first (approach) goal valence factor and loadings from the four items measuring performance avoidance goal orientation on the

second (avoidance) goal valence factor. We fixed the covariance between approach goal valence and normative evaluation standard as well as between avoidance goal valence and normative evaluation standard to zero. Thereby, we ensured that goal valence and evaluation standard were represented as independent, and therefore orthogonal, factors.

In a second step, we tested the construct validity of the postulated dimensions by associating them to the personal regulatory focus and social reference norm orientation. Thereby, we fixed factor loadings of the goal valence and the normative evaluation standard factors to the values obtained in the confirmatory factor analysis to ensure that the inclusion of validation criteria would not change the factor structure itself. Then, we included promotion and prevention focus as well as the social reference norm orientation as latent variables into the structural model. We freed three direct paths from these variables on the extracted factors: The first path indicated the expected relationship of a social reference norm orientation on the normative evaluation standard, whereas the second and the third paths indicated the assumed direct effects of the promotion as well as the prevention focus on their respective goal valence counterpart (promotion/approach; prevention/avoidance). All paths were expected to represent positive relationships.

The model fit of all computed models is reported according to recommendations by Hu and Bentler (1999). Hence, we used the  $\chi^2$ -test for model fit in combination with certain misfit (SRMR, RMSEA) and fit indices (CFI). Our interpretation of these indices relied on the rules of thumb for cut-off values by Schermelleh-Engel, Moosbrugger, and Müller (2003). Thus, we distinguished between an acceptable model fit (SRMR  $\leq$  .10, RMSEA  $\leq$  .08, CFI  $\geq$  .95) and a good model fit (SRMR  $\leq$  .05, RMSEA  $\leq$  .05, CFI  $\geq$  .97). In order to further investigate the construct validity of the extracted factors, we used a Chi-Square Difference test with scaling correction (Satorra & Bentler, 1994) to compare the postulated structural equation model with a less restrictive model. In this model, we freed direct paths from all three potential predictors (social reference norm orientation, promotion focus and prevention

focus) on all three goal underlying dimensions. We expected that this inclusion of additional paths into the structural equation model would not enhance the obtained model fit significantly.

## 5.2 Results

Means, standard deviations and zero-order correlations between all applied scales are depicted in *Table 1*. The obtained zero-order correlations cannot be seen as conclusive evidence for our dimensional model because they solely show association patterns for goal orientation instances. Nevertheless, the overall association pattern supports the validity of these goal orientation instances since both performance goal orientations are linked positively to a social reference norm and the respective goal valence. However, the promotion focus was unexpectedly also slightly associated to a performance avoidance goal orientation.

--- Insert Table 1 about here ---

### 5.2.1 Dimensional Structure

The initial factor analysis did not result in the assumed bifactor structure. Although the model fit was good,  $\chi^2(11; n = 321) = 9.37, p = .58, SRMR = .01, RMSEA = .00, CFI = 1.00$ , only 7 out of 16 postulated factor loadings reached significance. These factor loadings were distributed between two factors (none of the loadings on the approach goal valence dimension reached significance), which if anything would have resembled the two original performance goal orientations but in an orthogonal fashion. The observed factor loadings of this first solution seemed rather random and unconventional. Nevertheless, the data pattern gave us a clear hint as to why this strange pattern occurred: The factor loadings of one particular item of the approach goal orientation subscale diverged in its pattern from the loadings of the other three items. None of the factor loadings of this item on either factor reached significance and one of the two assumed factor loadings even pointed in the wrong direction. Interestingly, the

item was not only more strongly associated with performance avoidance goal orientation items than the other three performance approach goal orientation items<sup>2</sup>, but also more strongly associated with the social reference norm orientation<sup>3</sup>. Hence, we concluded that the item itself resembled the evaluation focus in a much stronger fashion than the other items measuring performance approach goal orientation. This was also plausible by the wording of the item, which was “At university, it is my goal that others think that I am smart.” The item did not include any information on the question of whether this goal would typically be accomplished by demonstrating capability or if it would be accomplished by covering up incapability.

Thus, we modified our model by excluding the factor loading of this item on the approach goal valence factor. After this step, the resulting model obtained a good model fit;  $\chi^2$

<sup>2</sup> The mean correlation between the other three items measuring performance approach goal orientation with the four items measuring performance avoidance goal orientation was  $r = .17$ , with a range from  $r = .04$  ( $p = .463$ ) to  $r = .29$  ( $p < .001$ ). The mean correlation between the four performance avoidance goal orientation items with the item in question was  $r = .52$ , ranging from  $r = .48$  ( $p < .001$ ) to  $r = .58$  ( $p < .001$ ). A z-test on the difference of the two mean correlations (as depicted by Steiger, 1980) reached significance ( $z = -5.95$ ,  $p < .001$ ).

<sup>3</sup> The item in question correlated to  $r = .38$  ( $p < .001$ ) with the scale measuring the social reference norm orientation. The mean correlation between the other three items measuring the performance approach goal orientation with the social reference norm orientation scale was  $r = .23$ , ranging from  $r = .18$  ( $p < .001$ ) to  $r = .27$  ( $p < .001$ ). The difference between the scale-item correlation of the item in question and the mean scale-item correlation of the other items was significant ( $z = -2.46$ ,  $p = .007$ ).

(12;  $n = 321$ ) = 11.35,  $p = .50$ ,  $SRMR = .01$ ,  $RMSEA = .00$ ,  $CFI = 1.00$ . A chi-square Difference test revealed that there was no significant difference between the model fit of the original and the second factor model,  $\Delta\chi^2(1) = 2.40$ ,  $p = .12$ . Moreover, in the second factor model, all postulated factor loadings were significant and pointed in the assumed direction. The resulting bifactor model consists of three factors representing goal underlying dimensions and is depicted in *figure 3*. Our dimensional approach covered 59 percent of the total item variance in total. Thereby, the factor indicating the normative evaluation standard covered bigger parts of the explained variance (62 percent for items measuring performance approach goal orientation and 66 percent for items measuring performance avoidance goal orientation) than the factors indicating goal valence. Although we did not assume that both goal valence dimensions were independent, no significant association between the two factors could be observed.

--- Insert Figure 3 about here ---

### **5.2.2 Associations to Reference Norm and Regulatory Focus**

In the next step of our analyses, we included promotion focus, prevention focus and social reference norm orientation as latent variables. We freed direct paths from these variables on the goal underlying dimensions according to the postulated path model. The obtained model fit was acceptable,  $\chi^2(134; n = 321) = 212.51$ ,  $p < .001$ ,  $SRMR = .07$ ,  $RMSEA = .04$ ,  $CFI = .96$ , and the observed path coefficients are depicted in *figure 4*.

--- Insert Figure 4 about here ---

As expected, the social reference norm orientation regarding own achievement was positively predictive for the factor resembling a normative evaluation standard. Furthermore,

both regulatory foci proved to be statistically significant predictors for the factors indicating goal valence. Thereby, a promotion focus was positively predictive for the strength of the approach goal valence, whereas a prevention focus was positively predictive for the strength of the avoidance goal valence. Moreover, the amount of explained variance on the goal valence factors as well as on the factor representing the normative evaluation standard proved to be substantial and resembled medium to strong effect sizes.

At last, we compared the postulated model to a less restrictive model in which we freed all direct paths from the predictive variables (promotion focus, prevention focus and social reference norm orientation) on the factors representing goal underlying dimensions. In contrast to our initial assumptions, the less restrictive model showed a significantly better model fit than the postulated model,  $\Delta\chi^2(6) = 15.38, p = .018$ , although the overall model fit did not improve drastically;  $\Delta SRMR = .01, \Delta RMSEA = .00, \Delta CFI = .00$ . Two out of six newly included paths reached significance: The promotion focus was negatively predictive for the factor indicating an avoidance goal valence ( $\beta = -.25, p = .020$ ) and the prevention focus was negatively predictive for the factor indicating an approach goal valence ( $\beta = -.26, p = .004$ ). The remaining path structure (depicted in *figure 4*) was quite similar to the postulated model. The two obtained unexpected paths support the assumption that the goal valence factors indicate the respective goal valence in absence of the opposing goal valence.

## 6. Study 2

The main goal of our second study was to supplement the findings of the first study regarding the construct clarity of goal underlying dimensions with empirical support for their criterial validity by tying these dimensions to possible antecedents and consequences. With regard to antecedents, we anticipated that the perception of competition lays the foundation for normative comparisons and, thus, positively predicts the strength of the normative evaluation standard. With past findings concerning the importance of competence expectancies in mind (Elliot & Church, 1997), we assumed that perceived competence

support would impact goal valence: We anticipated that competence support enhances the personal expectation to succeed and, therefore, facilitates an approach goal valence and suppresses an avoidance goal valence. In other words, we expected perceived competence support to be a positive predictor for approach goal valence and a negative predictor for avoidance goal valence. When focusing on consequences, we expected that a normative evaluation standard positively predicts performance anxiety because it should enhance the perceived possibility of failure. However, we also assumed that an avoidance goal valence is positively predictive for performance anxiety since it should enhance the subjective importance of failure prevention. These postulated associations should explain why a performance avoidance goal orientation is more strongly tied to performance anxiety than a performance approach goal orientation (Elliot & McGregor, 1999; Huang, 2011).

Furthermore, we assumed that an avoidance goal valence negatively predicts intrinsic motivation and graded performance, whereas an approach goal valence should positively predict graded performance. These predictions are in line with past findings on the differential effects of performance goal orientations (Dinger et al., 2013; Elliot & Church, 1997). All resulting hypotheses are summarized within the respective structural model depicted in *figure 2*.

## **6.1 Method**

### **6.1.1 Sample**

We used a subsample from a longitudinal study consisting of 1290 German secondary school students (53.7 % female, mean age at measurement point 1 = 10.0 years;  $SD = 0.45$  years) clustered in 70 classes. The students were questioned with pen-and-paper questionnaires at three measurement points during their first two years in the academic track of the German school system (classes 5 and 6). We only included students in our analyses

who participated at all three measurement points<sup>4</sup>. The first measurement point (halfway through the first year in the academic track) contained data on the perceived working climate in class and therefore on possible antecedents of goal underlying dimensions. We used the data from the second measurement point (end of the first year in the academic track) to model the goal underlying dimensions and data from the third measurement point (first months in the second year in the academic track) to address possible consequences.

### 6.1.2 Measures

We used the same items to assess *performance goal orientations* as in study 1. However, all items focused on the performance goal orientations of the questioned students in mathematics classes. All other measures were also related to mathematics classes.

*Competence support* by the students' math teacher was assessed with a questionnaire developed for the longitudinal study, which partly consisted of items derived from a well validated German scale developed for a research program on teacher competencies (Kunter, Baumert, & Blum, 2011). In total, the questionnaire had seven items ( $\alpha = .79$ ); including, for example, "In math class, our teacher recognizes when I am doing well."

<sup>4</sup> We conducted survival analyses to investigate whether the students participating at the first two measurement points differed in their profile from those participating at all three measurement points since a substantial drop-out occurred between the second measurement point and the third measurement point. These analyses indicated that those students who dropped-out reported a significantly higher performance avoidance goal orientation,  $F(1, 3301) = 22.819, p < .001, \eta = .003$ , and perceived their surroundings to be more competitive,  $F(1, 3301) = 11.349, p = .001, \eta < .001$ , than those students in our final sample. However, we cannot speak of small effect sizes ( $\eta > .01$  according to Cohen, 1992) and would, thus, conclude that the motivational profile of our final sample is not substantially biased.

*Interest in mathematics* was measured as a self-report measure for mathematics related intrinsic motivation with a subscale from a German questionnaire designed specifically to assess different aspects of students' learning motivation (Dresel, Ziegler, Schober, & Stöger, 2005). One example of the four items measuring interest in mathematics ( $\alpha = .90$ ) is "I am interested in math."

The subscale for *performance anxiety in mathematics* was also derived from the aforementioned questionnaire developed by Dresel et al. (2005). It consisted of six items ( $\alpha = .92$ ) like "When I think of math, I experience fear of getting a bad grade."

The items of all aforementioned scales (performance goal orientation, competence support, interest in mathematics, performance anxiety) were measured with a Likert-type scale ranging from 1 (*total disagreement*) to 6 (*total agreement*).

The degree of *perceived competitiveness* in the classroom was assessed with three items directly developed for the longitudinal study ( $\alpha = .67$ ). The scale applied a Likert-type scale ranging from 1 (*never*) to 5 (*always*). A sample item is "In our math class, our teacher makes us compete against each other in contests".

Finally, *graded performance* was assessed by asking the participating students about their last overall math grade at the end of class 5. Even though this overall math grade was assessed at the third measurement point, it was actually assigned to the students in the time span between the second and the third measurement point. It should be noted that the best grade in Germany is a 1 (very good) and the worst grade is a 6 (insufficient). We recoded the variable to ensure that the interpretation of paths on graded performance would be more intuitive. After recoding, the variable ranged from 1 (insufficient) to 6 (very good). Hence, a positive association with the variable reflected a positive effect on performance, whereas a negative association reflected a negative effect on performance. While we are aware that self-reported grades can be considered as biased proxies for actual grades at best (Kuncel, Credé,

& Thomas, 2005), due to legal reasons it was not an option to link our data to the actual grades of the students.

### 6.1.3 Analyses

Our procedures were similar to the procedures applied in study 1. At first, we extracted the three goal underlying dimensions from the items measuring performance goal orientations<sup>5</sup>. Afterwards, we fixed the factor loadings to the obtained values and computed a Structural Equation Model with the assumed antecedents and consequences of the goal underlying dimensions. All constructs were modeled on a latent level. We freed paths according to the previously defined hypotheses. We compared this model with a less restrictive model where all direct paths from potential antecedents on goal underlying dimensions as well as all direct paths from goal underlying dimensions on potential consequences were freed. As in study 1, we utilized the robust maximum likelihood estimator (MLR) for our analyses and evaluated the model fit according to the same guidelines. Additionally, we corrected the standard errors with the `type = complex` command, which was necessary because the school students were clustered within classes. Missing data was handled with the Full Information Maximum Likelihood Imputation provided by Mplus.

## 6.2 Results

Means, standard deviations and zero-order correlations of the applied scales are depicted in *table 2*. As highlighted in study 1, the obtained zero-order correlations should be interpreted with caution. That said, the association pattern seems rather typical for research on performance goal orientation instances: Both performance goal orientations shared positive

<sup>5</sup> As in study 1, we only freed factor loadings from three out of four items measuring performance approach goal orientation on the factor representing an approach goal valence. The item “In math class, it is my goal that others think that I am smart.” indicated the normative evaluation standard but none of the goal valence dimensions.

associations to perceived competitiveness and diverged in their associations to perceived competence support. Furthermore, we found both performance goal orientations to be positively associated to performance anxiety. Moreover, this relationship was stronger for a performance avoidance goal orientation. Altogether, the association pattern seems to confirm that our sample has a rather typical motivational profile, even though the associations of both performance goal orientations with interest and graded performance were not as clear as expected within the zero-order correlations.

--- Insert Table 2 about here ---

### **6.2.1 Dimensional Structure**

We applied the bifactor model obtained in study 1 to our data and it fitted the data very well,  $\chi^2(12; n = 1290) = 7.79, p = .80, SRMR = .01, RMSEA = .00, CFI = 1.00$ . The factor loadings are shown in *figure 3* alongside those obtained in study 1. The three goal underlying dimensions were again applicable for 59 percent of the total item variance. The normative evaluation standard was applicable for 62 percent of the explained variance on the items measuring performance approach goal orientation and for 63 percent of the explained variance on the items measuring performance avoidance goal orientation. The amount of item variance explained by the obtained factors is very similar to the amount of explained item variance in study 1. Moreover, the factor loadings also resembled their respective counterparts from study 1. However, in contrast to study 1, a significant negative correlation between the two goal valence factors occurred ( $r = -.43, p < .001$ ), which might be due to the higher power in the second sample.

### **6.2.2 Antecedents and Outcome Variables**

The tested structural equation model had an acceptable model fit,  $\chi^2(292; n = 1290) = 785.37, p < .001, SRMR = .04, RMSEA = .04, CFI = .96$ , and is presented in *figure 5*. Starting

with antecedents of the three obtained dimensions, we can see that perceived competitiveness predicted a normative evaluation standard, while perceived competence support differentiated between the approach and avoidance goal valence (positive relationship to approach goal valence, negative relationship to avoidance goal valence). In line with our hypotheses, normative evaluation standard as well as avoidance goal valence both negatively predicted performance anxiety. Furthermore, a direct negative effect of avoidance goal valence on interest in mathematics could be observed, as expected. Even though avoidance goal valence predicted graded performance, the explained variance did not reach significance ( $R^2 = .01$ ,  $p = .28$ ). Furthermore, the path from approach goal valence on graded performance did not reach significance nor did it point in the expected direction. The other obtained effect sizes ranged from 5 to 13 percent of explained variance, which corresponds with small to medium effect sizes.

In a last step, we compared the postulated model with a less restrictive model where all paths from potential antecedents (competence support, perceived competitiveness) on goal underlying dimensions as well as all paths from goal underlying dimensions on potential consequences (performance anxiety, interest, reported grades) were freed. The less restrictive model did not achieve a significantly better fit than the postulated model,  $\Delta\chi^2 (7) = 13.61$ ,  $p = .059$ , which led us to the conclusion that none of the additional paths had to be added to our postulated model.

--- Insert Figure 5 about here ---

## 7. General Discussion

We conducted two studies to test the assumption that performance goal orientations are heterogeneous constructs founded in goal underlying dimensions. In the first study, we showed that it is indeed possible to extract a factor indicating a normative evaluation standard

as well as two factors indicating diverging (approach versus avoidance) goal valences from items measuring performance goal orientations. We showed that the supposed normative evaluation standard factor was related to a social reference norm orientation, while the two goal valence factors were related to the corresponding regulatory focus subscales. Moreover, additional analyses unexpectedly showed that the goal valence factors were negatively associated to the opposing regulatory focus subscales. The paths seem to indicate that the extracted goal valence factors reflect the dominant goal valence in the absence of the opposing goal valence. These results are especially interesting because they deliver clear evidence on the assumption that performance approach goal orientations are indeed founded in approach tendencies that are by no means positively associated to avoidance motivation. Thus, it seems likely that previous findings supporting a small association to avoidance tendencies (see especially Elliot & Thrash, 2002) might be a result of a possible relation between the inherent normative evaluation standard and fear of failure (in line with the hierarchical model of approach and avoidance motivation, see Elliot & Church, 1997). In sum, our first study provides critical evidence on the postulate that performance goal orientations are founded in goal underlying dimensions reflecting their normative evaluation standard and respective goal valence.

In our second study, we expanded the results of the first study by investigating the criterial validity of goal underlying dimensions. Regarding potential antecedents, we found that a strong competitive climate was predictive for a normative evaluation standard, but not for the goal valence. This indicates that individuals within a highly competitive climate are likely to adopt any or both of the two performance goal orientations. In contrast, the degree of perceived competence support was positively predictive for approach goal valence and negatively predictive for avoidance goal valence. Hence, the degree of competence support makes a difference on the goal valence of the adopted performance goal orientation. These results show that the dimensional approach can help to explain in which contexts individuals

tend to adopt performance goal orientations and also which performance goal orientation becomes dominant in the situation in question. Moreover, some of the highly debated associations of performance goal orientations to outcome variables can also be explained within the dimensional approach: We could show that a normative evaluation standard and an avoidance goal valence positively predict performance anxiety. This explains why both performance goal orientations are linked to performance anxiety as well as why this association is closer for a performance avoidance goal orientation compared to a performance approach goal orientation. Avoidance goal valence also negatively predicted interest, which is in line with the finding that performance avoidance goal orientations are often found to be negatively related to intrinsic motivation. In conclusion, we found that the adoption of a normative evaluation standard can be considered maladaptive for learning related outcomes (e.g., performance anxiety), but that the strongest negative effects unravel when it is supplemented with an avoidance goal valence. Taken together, we think that the described findings contribute to the ongoing debate on the necessity to divide performance goal orientations alongside their goal valence.

### **7.1 Contribution to the Theoretical Debate on Performance Goal Orientations**

Although researchers have said that instances of performance goal orientations are founded within two distinct dimensions (especially Elliot & McGregor, 2001; Elliot & Thrash, 2002), these goal underlying dimensions have never been appropriately extracted or validated. We have shown that items measuring performance approach and performance avoidance goal orientations indeed reflect one of two goal valences and a normative evaluation standard. Moreover, we were able to replicate this dimensional structure within a sample of children with a mean age of 10 years, although previous developmental studies gave rise to doubts that the goal valence dimension would be present within this age group (Bong et al., 2013). The amount of explained variance and the factor loadings were quite similar in both samples, besides the fact that the samples reflected different achievement

related contexts (university and school) as well as age groups. This pattern of results makes us confident that the dimensional structure of performance goal orientations can be generalized between contexts and even between stages of the lifespan.

Moreover, the distribution of item variance between the two groups of goal underlying dimensions gives us further insights into the interdependence of performance goal orientations: The normative evaluation standard was accountable for a greater proportion of variance than the respective goal valence in both samples. This could be the reason for the often obtained high association between both performance goal orientations. Furthermore, our in-depth analyses of the goal valence dimensions also gave some indications for the reasons behind some interesting aspects of the association patterns for performance goal orientations: More specifically, the factors indicating goal valence were not only positively associated with the regulatory focus that primarily indicated the respective goal valence but also negatively associated with the regulatory focus indicating the opposing goal valence. This pattern of results might partly explain why performance goal orientations are not only differentially but sometimes even oppositely associated with antecedents and consequences of achievement goal orientations (as shown in study 2 for perceived competence support).

Our findings provide a first glance at the new options of a change in perspective within achievement goal approach: Past research in this field mainly focused on achievement goal instances that confound goal underlying dimensions (e.g., performance approach and performance avoidance goal orientations). Thereby, it struggled when explaining whether different goal instances are maladaptive or adaptive for learning (Midgley et al., 2001) and whether they are universal to all people (Urda & Mestas, 2006) or age groups (Bong et al., 2013). A shift in perspective on goal underlying dimensions offers new opportunities to address these questions on a deeper level: Instead of testing whether performance goal orientations are adaptive or maladaptive, a dimensional approach allows for investigations into how constituting elements behind performance goal orientations contribute to

maladaptive or adaptive outcome patterns. Instead of asking whether all individuals differentiate between performance approach and performance avoidance goal orientations, a dimensional perspective enables us to investigate more differential questions like whether the dimensional structure stays the same through different age groups (indicated by the distribution of variance within the estimated factorial models). In sum, the shift of focus of empirical studies on the dimensions that have been the postulated foundation of achievement goal orientations for over a decade (Elliot & McGregor, 2001) holds a lot of potential for fascinating research questions. Besides these theoretical opportunities, the dimensional approach also provides a new possibility to validate existing measurements of achievement goal orientations.

## **7.2 Consequences for Measurement and Practical Implications**

A major criticism regarding existing measures of performance goal orientation is their lack of construct clarity. For instance, Hulleman, Schrage, Bodmann, and Harackiewicz (2010) found in their well-regarded meta-analysis that items of achievement goal orientation questionnaires often also assess a broad range of non-goal relevant contents. This highlights the problem that many results found in achievement goal research are based on measurements assessing confounded constructs. One possible response to this problem could be to apply factor analytic methods that focus on the theoretically relevant goal underlying dimensions and suppress the parts of variance that are not applicable for these dimensions. Thereby, it would be possible to conduct research with imperfect measures without losing explanatory power due to variance representing goal irrelevant content and measurement error.

This solution can, however, only be seen as provisional because problems could occur when large systematic parts of goal irrelevant variance are represented in the items of the questionnaire (e.g. fear of failure, which is represented in a lot of items measuring performance avoidance goal orientation according to Hulleman et al., 2010). Thus, we need additional solutions to solve the problem like the construction of new, more valid

questionnaires. Here, the described factor analytic methods could also be useful to ensure a higher standard of construct clarity: In our studies, a large amount of residual variance could neither be explained by goal valence nor the normative evaluation standard, even though we already used an item selection from a highly established achievement goal orientation questionnaire. Hence, an additional goal for researchers constructing new items measuring performance goal orientations should be to improve the variance explained by the assumed dimensional factor structure and simultaneously reduce the residual variance. Addressing both dimensions in the wording of new items could achieve this. For example, the normative evaluation standard can easily be addressed with phrases like "... in comparison to others", whereas an avoidance goal valence might be addressed with words like "avoid" or "prevent". With the results by Hulleman et al. (2010) and the dimensional theory by Elliot and McGregor (2001) in mind, reducing item wording that is not related to evaluation standard or goal valence should be an important goal.

Finally, the results of our studies might be valuable for practitioners within educational contexts: We found no evidence for the assumption that either of the performance goal orientations should be considered as adaptive for learning, even the expected positive effects of an approach goal valence on graded performance could not be observed. However, this particular finding could also be based on the limited validity of reported grades as a measure for performance (Kuncel et al., 2005) or the fact that we did not adopt a multi-goal perspective as recommended by Midgley et al. (2001). But even if we allow for this shadow of a doubt, we can still rely on the finding that the personal normative evaluation standard itself was positively related to performance anxiety. This finding links both performance goal orientations to a maladaptive outcome. Thus, we cannot recommend teaching practices that focus on normative comparison and competition to teaching professionals. Nevertheless, we do know that practitioners cannot abandon such strategies altogether, especially in educational contexts that rely on graded testing. While these contexts might inflict the negative

consequences of the adoption of a normative evaluation standard, our results also indicate that severe negative effects will only occur when individuals simultaneously adopt an avoidance goal valence. Moreover, our findings indicate that the strength of the avoidance goal valence can be decreased with teaching strategies focusing on competence support. One possible application of this finding within teaching practices could be to use positive feedback on personal learning in highly competitive situations, since this method has been linked to an increase in personal perceptions of competence within learners (Senko & Harackiewicz, 2005).

### **7.3 Limitations and Future Directions**

An important limitation of the results of our studies concerns the postulated causal order of antecedents, goal relevant dimensions and outcome variables. Our assumption largely relied on the hierarchical model of achievement motivation (Elliot & Church, 1997; Elliot & McGregor, 1999). For instance, we assumed that intrinsic motivation would be a consequence rather than an antecedent of performance goal orientations. While there might be good reasons to expect this line of causality, there is also research framing intrinsic motivation as a possible antecedent of achievement goal orientations (Ciani, Sheldon, Hilpert, & Easter, 2011; Malmberg, 2008). Overall, the question for causality within achievement goal approach is often difficult to resolve, since a lot of research does not rely on typical causal analyses like cross-lagged panel analyses or growth curves. The objective of our research, however, was not to answer whether the chicken or the egg came first, but rather to show that previous often cited results can be explained under the lens of a dimensional approach. Nevertheless, it would be interesting to answer the aforementioned question for causality on antecedents and consequences of goal underlying dimensions in future research. Inspiration for such research might be found in the literature on regulatory focus and reference norm orientations.

Furthermore, we solely relied on self-report measures within our studies. We are aware that the usage of self-reports is strongly debated in the field of motivational research.

However, many original studies about performance goal orientations also largely rely on these kinds of measures (e.g. Elliot & Church, 1997; Elliot & Harackiewicz, 1996; Elliot & Thrash, 2002; Murayama et al., 2011). While we agree that the application of behavioral or neurological measures has a strong merit for achievement goal orientation research, we are not convinced that using such measures would allow us to connect our results to the existing body of literature on the distinction of performance approach and avoidance goal orientations. Nevertheless, we have to admit that even though past research has shown that self-reported grades in mathematics are strongly linked to actual grades within German students (O. Dickhäuser & Plenter, 2005), our reliance on this measure might limit the validity of the findings in our second study (see Kuncel et al., 2005). Thus, future research could include more objective measures of academic performance to uncover the effects of goal valence on performance under stricter control of error variance.

Both of our studies relied on data from German samples, which could affect the generalizability of our results. Yet, cross-cultural research has shown that especially the association between performance approach and performance avoidance goals corresponds between different cultures (see Murayama et al., 2011). This could mean that the distribution of variance between goal underlying dimensions is also comparable between cultures. Nevertheless, it might still be interesting to test this hypothesis by replicating our results within samples from diverging cultures. Another issue regarding the generalizability of our results concerns the fact that the findings of our second study are limited to a specific area, i.e., education in mathematics. The validity of our results could be enhanced further by replicating them within other clearly defined areas (e.g., language education, science education) or on a more general level by focusing on broader constructs (e.g., intrinsic motivation at school or academic self-efficacy).

In this article, we focused on performance goal orientations due to the common research practice of separating them into performance approach and performance avoidance

goal orientations. However, there have been several additional attempts to diversify achievement goal orientations like the 2x2 model (separating learning approach from learning avoidance goal orientations, see Elliot & McGregor, 2001) or the even more complex 3x2 approach to achievement goal orientations (Elliot et al., 2011; Lüftenegger et al., 2016). Existing research on these models also lacks the necessary evidence for the theoretically applied dimensional structure that meant to characterize the examined achievement goal orientation instances. We think that research within the aforementioned approaches should also evaluate the assumed dimensional structure of achievement goal orientations by conducting corresponding bifactor models.

### **8. Conclusion**

While the wise phrase “*the whole is greater than the sum of its parts*” might often be applicable to psychological constructs, we do think that research on achievement goal orientations can greatly benefit from a systematic and theoretical plausible deconstruction of achievement goal orientations. The present approach integrates seemingly conflicting conceptions of performance goal orientations - namely univariate versus dichotomous conceptions - by focusing on goal underlying dimensions. Although such goal underlying dimensions have been theoretical assets to achievement goal research for quite a while, they have rarely been empirically addressed. Hence, we believe that our findings contribute to a better understanding of these core elements of the achievement goal research framework.

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**Table 1**

Zero order correlations, descriptives and internal consistencies for the scales applied in study 1.

	<i>M</i>	<i>SD</i>	<i>α</i>	(1)	(2)	(3)	(4)
(1) Performance approach goal orientation	4.66	1.00	.71				
(2) Performance avoidance goal orientation	2.84	1.18	.90	.42**			
(3) Promotion focus	4.98	1.00	.72	.36**	.13*		
(4) Prevention focus	3.84	1.23	.70	.07	.30**	.27**	
(5) Social reference norm orientation	3.85	1.14	.75	.37**	.38**	.20**	.13*

\*\* p < .01

*Note.* All used scales ranged from 1 (*total disagreement*) to 7 (*total agreement*).

**Table 2**

Zero order correlations, descriptives and internal consistencies for the scales applied in study 2.

	<i>Measuring Point</i>	<i>M</i>	<i>SD</i>	$\alpha$	(1)	(2)	(3)	(4)	(5)	(6)
(1) Perceived competence support	T1	4.68	0.75	.79						
(2) Perceived competitiveness	T1	2.05	0.83	.67	-.03					
(3) Performance approach goal orientation	T2	3.97	1.03	.73	.12**	.21**				
(4) Performance avoidance goal orientation	T2	2.38	1.17	.88	-.17**	.22**	.44**			
(5) Performance anxiety	T3	2.37	1.22	.93	-.20**	.13**	.12**	.26**		
(6) Interest	T3	3.45	1.33	.90	.17**	.05	.14**	-.05	-.21**	
(7) Graded performance	T3	4.80	0.75	-	.14**	-.06	-.06	-.12**	-.26**	.23**

\*  $p < .05$

\*\*  $p < .01$

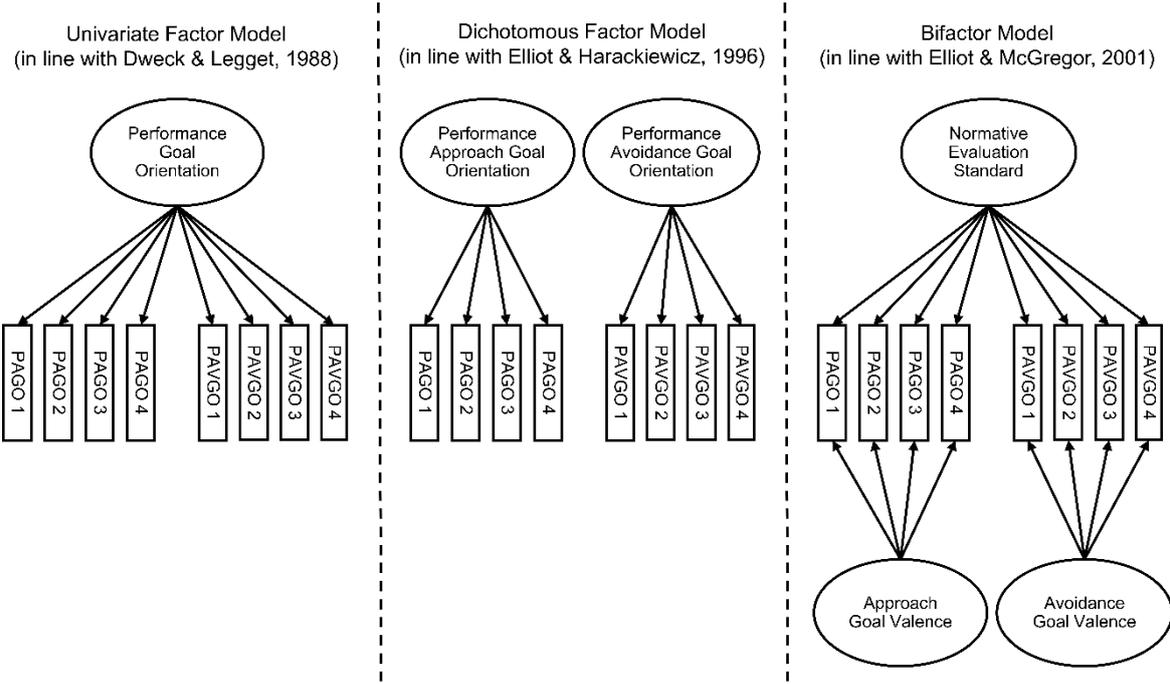


Figure 1. Graphical representation of the measurement models behind different theoretical conceptualizations of performance goal orientations. PAGO = Items measuring a performance approach goal orientation, PAVGO = Items measuring a performance avoidance goal orientation.

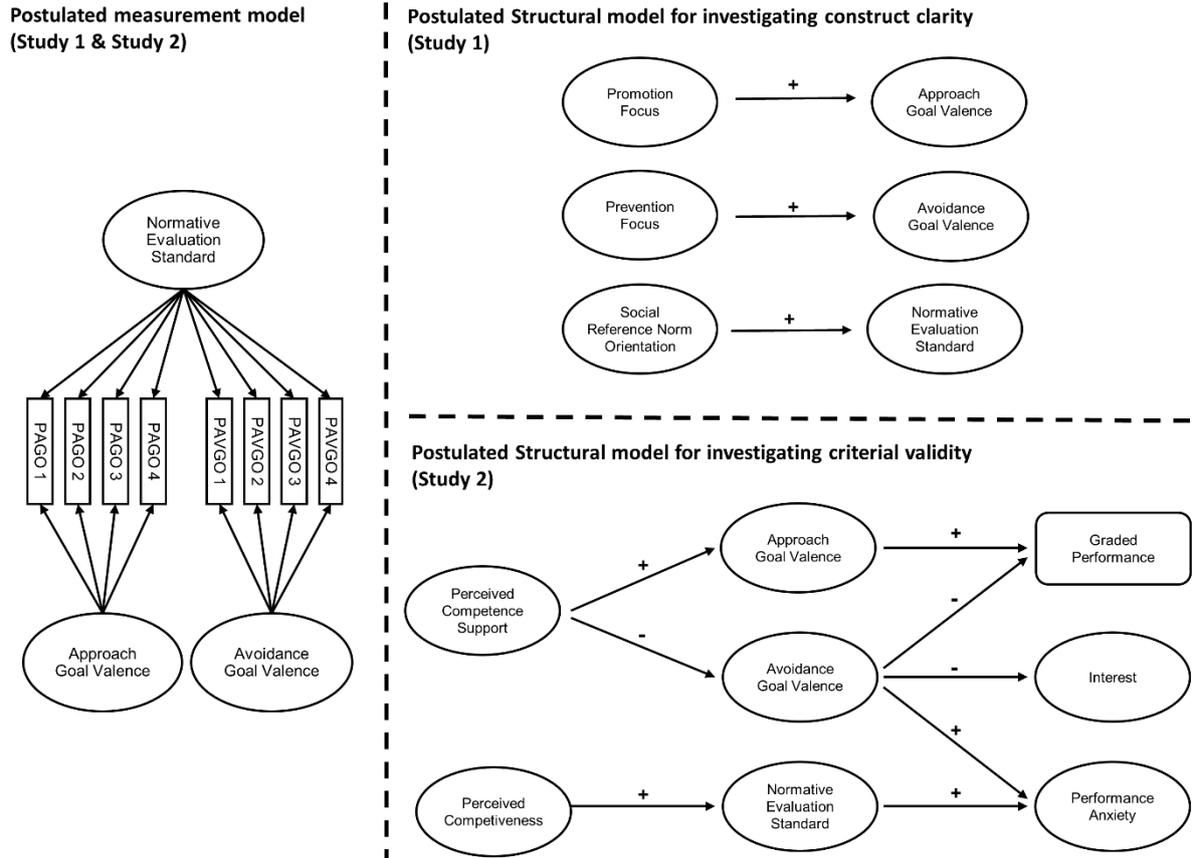


Figure 2. Illustration of the two-staged analytic process depicting the investigated bifactor model as well as both postulated structural models that serve to investigate the construct clarity and criterial validity of the extracted goal underlying dimensions.

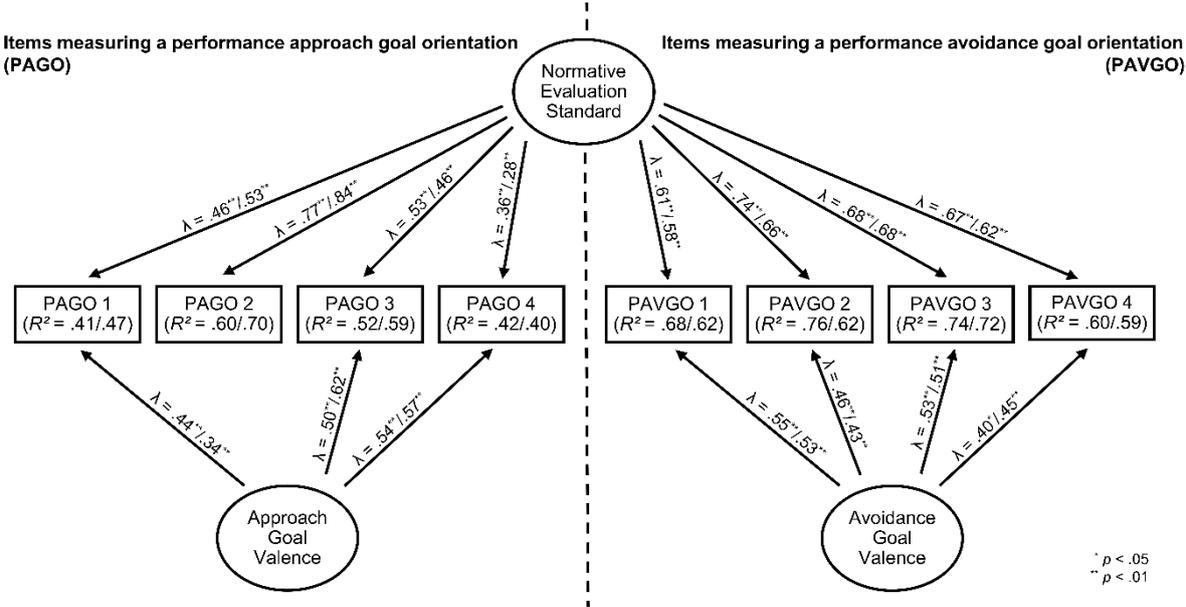


Figure 3. Obtained factor loadings and explained variance of the bifactor model. Values for both studies are given (first number = study 1; second number = study 2). The depicted Items are provided in the appendix of this article.

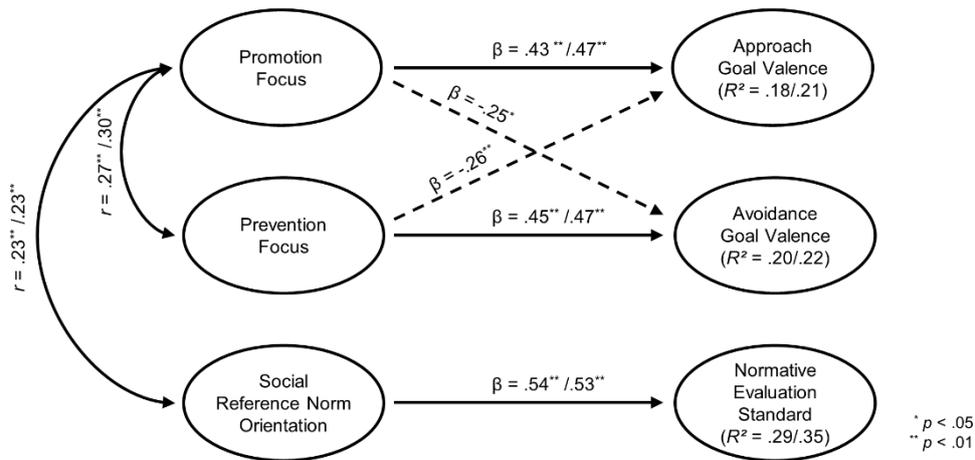


Figure 4. Structural equation model conducted in study 1. No factor loadings are displayed for better comprehensibility. Factor loadings of the goal valence and normative evaluation standard factors are presented in figure 1. All other factor loadings range from  $\lambda = .51$  to  $\lambda = .84$  and are significant ( $p < .001$ ). Path coefficients for the postulated as well as the base model are given (first number = postulated model; second number = base model). The dashed arrows were the only additional paths that reached significance within the base model.

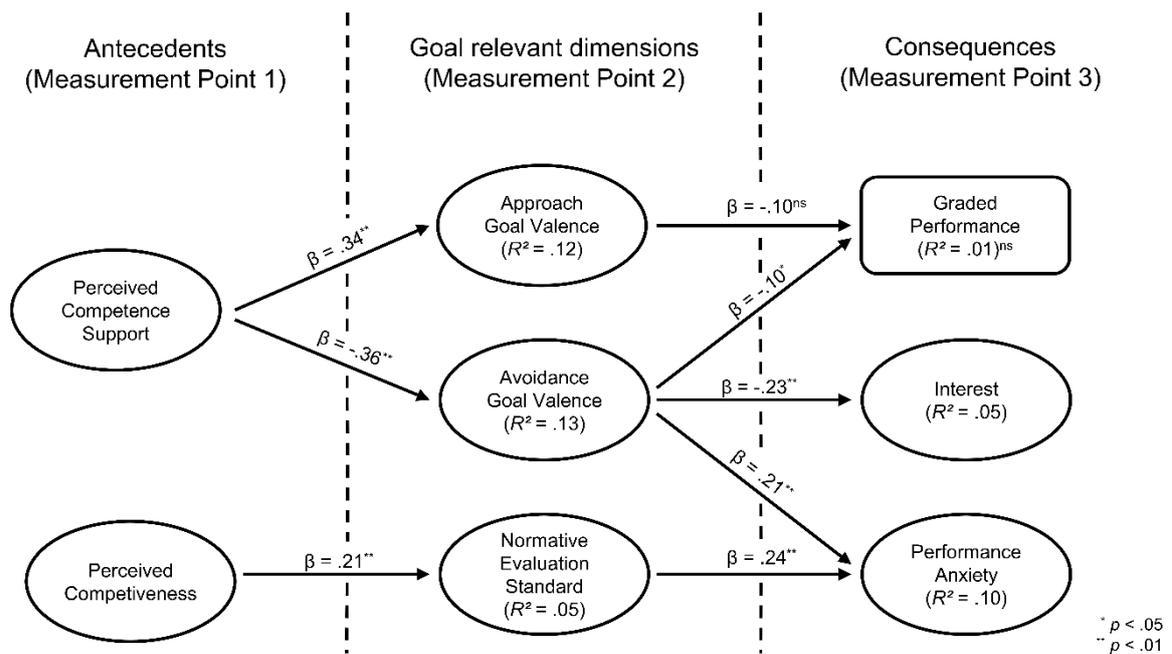


Figure 5. Structural equation model conducted in study 2. No factor loadings or correlations between outcome variables (graded performance, interest and performance anxiety) are displayed for better comprehensibility. Factor loadings of the goal valence and normative evaluation standard factors are presented in figure 1. All other factor loadings range from  $\lambda = .45$  to  $\lambda = .92$  and are significant ( $p < .001$ ). As indicated, the amount of explained variance on graded performance was not significant.

## Appendix

**Performance goal orientation short scale**

At university [during math lessons], it is my goal ...

## Approach goal orientation

- 1) ... to demonstrate that I am good at something.
- 2) ... that others think that I am smart.
- 3) ... to demonstrate that I am proficient in the course content.
- 4) ...to demonstrate what I know and can do.

## Avoidance goal orientation

- 1) ... that nobody recognizes when I fail to understand something.
- 2) ... to avoid demonstrating that I am less smart than others.
- 3) ... to conceal my lack of knowledge in situations where I know less than others.
- 4) ... to avoid exposing that a task challenges me more than others.