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Relations between teachers' goal orientations, their instructional practices as expressed in perceived classroom goal structures and students' goal orientations were analyzed, focusing also on potential moderators. Results of a questionnaire study with 46 Mathematics teachers and their 930 students supported the assumption that teachers' goal orientations affect their instructional practices and students' goal orientations. These effects were, in part, moderated by teacher beliefs (implicit theories, self-efficacy beliefs). Overall, the results provided strong support for the notion that the mechanisms underlying these effects are based on the functionality of certain instructional practices for the attainment of teachers' goals.

Keywords: Teacher Motivation; Goal Orientation; Instruction; Classrooms; Achievement Motivation

Introduction

Achievement goal theory is a powerful framework to describe motivation in social achievement and learning contexts, and its consequences in terms of cognition and behavior (Ames, 1992; Dweck, 1986; Nicholls, 1984; for an overview see Elliot, 2005). This is not only true for the population of students, which researchers have extensively analyzed within this framework (for an overview see Maehr & Zusho, 2009). Recently, Butler (2007) applied achievement goal theory also to the population of teachers. In the meantime, considerable evidence has been collected to suggest that teachers' goal orientations determine their experiences and own learning behaviors (e.g., Butler, 2007; Dickhäuser, Butler & Tönjes, 2007; Malmberg, 2008; Fasching, Dresel, Dickhäuser, & Nitsche, 2011; Nitsche, Dickhäuser, Fasching, & Dresel, 2011). Furthermore, it has also been assumed that teachers' goal orientations influence their instructional practices as well as the motivation and learning behavior of their students. Although researchers provided preliminary evidence to support this assumption (Butler & Shibaz, 2008; Retelsdorf, Butler, Streblow, & Schiefele, 2010), more research is needed to understand these associations. Therefore, we focus on the relationships between teachers' goal orientations, their instructional practices as expressed in students' perceptions of classroom goal structures and the goal orientations of their students. In doing so, we are focusing also on potential moderators of these relationships.

Achievement Goal Theory

Achievement goal orientations describe which goals individuals preferably pursue in social achievement contexts (Ames, 1992; Dweck, 1986; Nicholls, 1984). The core assumption is

that different achievement goal orientations create different motivational systems (e.g., processing self-related and task-related information, inferences concerning own competences, causal beliefs, standards) and therefore lead to different cognitive, affective and behavioral consequences (e.g., Elliott & Dweck, 1988). For the most part, research literature discriminates among three different goal orientations (for an overview see Maehr & Zusho, 2009): learning goal orientation (aim to expand one's own competences)[1], performance approach goal orientation (aim to demonstrate own competences), and performance avoidance goal orientation (aim to avoid demonstrating own competence deficits). Additionally, in the research tradition of Nicholls (1984), work avoidance goal orientation is sometimes considered, which refers to the aim to minimize effort in achievement settings[2].

Up to now, the primary focus of research has been on the goal orientations of students. In summarizing the patterns of findings regarding the consequences of student goal orientations (e.g., involvement, persistence, strategy use, emotional experiences, performance), learning goal orientation, on the one hand, are considered to be adaptive, while performance avoidance and work avoidance goal orientations, on the other hand, have to be considered maladaptive. Performance approach goal

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[1]To emphasize the focus on the expansion of own competences, we decided to use the term "learning goal orientation" instead of the terms "mastery goal orientation" or "task orientation" which are also used in the literature.
[2]In the past decade, theorists have also made a distinction between an approach and an avoidance component within learning goals (Elliot & McGregor, 2001; Pintrich, 2000). Although research has provided some evidence that learning avoidance goals lead to different consequences than learning approach goals (for overviews see Huang, 2012; Moller & Elliot, 2006), learning avoidance goals are beyond the scope of the present paper, mainly because no evidence exists to support the validity of this facet of goal orientation for teachers.

orientation must be understood as ambivalent (for an overview see Maehr & Zusho, 2009).

Teachers' Goal Orientations

Butler (2007) suggested that achievement goal theory is also suitable to describe teacher motivation and explain its consequences, founded on the notion that schools and classrooms not only constitute achievement contexts for students, but for teachers as well. This suggestion provoked a bundle of research in the field of teacher motivation, to the extent that a number of studies now exists to support this point of view (Butler, 2007; Butler & Shibaz, 2008; Dickhäuser et al., 2007; Malmberg, 2008; Fasching et al., 2011; Nitsche et al., 2011; Papaioannou & Christodoulidis, 2007; Retelsdorf et al., 2010; Tönjes, Dickhäuser, & Kröner, 2008).

Research on the structure of teacher goal orientations indicates that the aforementioned four-dimensional conceptualization is also appropriate for the population of teachers (Butler, 2007; Dickhäuser et al., 2007; Nitsche et al., 2011): Teachers' learning goal orientation refers to the aim to expand own professional competences. Teachers' performance approach and avoidance goal orientations refer to the aim to demonstrate superior teaching competences or to avoid demonstrating inferior teaching competences, respectively. Finally, teachers' work avoidance goal orientation refers to the aim to spend as little effort as possible in practicing the teaching profession. Existing evidence indicates that a teachers' learning goal orientation is positively associated with adaptive attitudes towards help and professional development and a more extensive learning behavior, while, in contrast, teachers' performance and work avoidance goal orientations are positively associated with maladaptive attitudes and stress experiences (Butler, 2007; Dickhäuser et al., 2007; Retelsdorf et al., 2010; Nitsche et al., 2011; Tönjes et al., 2008).

In an attempt to more specifically explain teacher goal orientation effects, Nitsche et al. (2011) suggested conceptualizing these four goal orientations as broad superordinate dimensions and then differentiating them, on a subordinated level. They proposed to differentiate learning goals with respect to the different types of professional competences a teacher can aim to expand, based on the notion that teachers need vastly diverse competences in order to accomplish the multitude of tasks demanded on them by their profession (Shulman, 1986). Therefore, Nitsche et al. differentiated between three subordinated types of learning goals: learning goals directed towards the expansion of pedagogical knowledge, learning goals directed towards the expansion of subject matter content knowledge and learning goals directed towards the expansion of pedagogical-content knowledge (Shulman, 1986). Moreover, Nitsche et al. proposed to differentiate performance goals with respect to the significant others to which they can be addressed. This is founded in the two components defining performance goals (Elliot, 1999), namely social comparison and appearance, and the presumption that to whom one wants to appear as competent, or does not want to appear as incompetent, is crucial (this presumption was already confirmed for the population of students; Ziegler, Dresel, & Stoeger, 2008). So, Nitsche et al. differentiated both the performance approach and performance avoidance goal orientations of teachers with respect to four addressee groups, namely three inter-personal addressees (school principals, teacher colleagues, and students), and the

acting teacher himself or herself as an intra-personal addressee (performance goals which are defined by social comparison, but do not imply that a positive appearance to others is a desirable state or a negative appearance to others is an undesirable state; Ziegler et al., 2008). Nitsche et al. (2011) provided empirical evidence that this conceptualization, including superordinate and subordinate dimensions, is more suitable to describe the goal orientations of teachers, and that different subdimensions of teachers' learning and performance goal orientations differentially predict attitudes towards help-seeking.

Teacher Goal Orientations and Instructional Practices

Butler (2007) also proposed considering teachers' goal orientations as antecedents of their instructional practices and, particularly, of the goals they emphasize in the classroom for their students. However, up to now, to the best of our knowledge, only two studies have been published which examined associations between teachers' goal orientations and their instructional practices (Butler & Shibaz, 2008; Retelsdorf et al., 2010). Nevertheless, this preliminary evidence supports the idea that teachers' professional behaviour in the classroom depends on the goals they pursue for themselves.

To adequately describe and explain goal orientation effects on instruction, a suitable conceptualization of teachers' instructional practices is at first essential. Here, we decided for the concept of classroom goal structures because it provides a broad conceptualization of teachers' instructional practices which they realize in their classrooms. Moreover, within the framework of achievement goal theory it is the prevailing concept to describe differences between the instructional practices of different teachers (for an overview see Meece, Anderman, & Anderman, 2006). Perceived classroom goal structures refer to student perceptions of the goal-related messages in the classroom and the extent to which the classroom environment allows for, or determines, the pursuit of learning and performance goals. Similar to personal goal orientations, classroom mastery goal structures and classroom performance goal structures are distinguished from one another, often complemented by a differentiation between approach and avoidance components within perceived classroom performance goal structures (Kaplan, Gheen, & Midgley, 2002; Meece et al., 2006; Schwinger & Stiensmeier-Pelster, 2011)[3]. It is assumed that teachers create a mastery goal structure if they emphasize the importance of learning and mastery, for example by using meaningful and individually challenging tasks, by making students responsible for personal improvement and understanding the subject matter, or by recognizing student effort and improvement (Patrick, Anderman, Ryan, Edelin, & Midgley, 2001; Turner et al., 2002). In contrast, it is assumed that teachers create a performance approach and/or avoidance goal structure if they strongly focus on grades and the accuracy of answers, realize a normative grading practice, use ability grouping and competition in the classroom, or reward high-achieving students with privileges and/or refuse privileges to low-achieving students. Numerous studies revealed the robust finding that mastery goal structures lead to adaptive motivational and behavior outcomes and per-

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[3]In contrast to personal goal orientations, whereby terms are used heterogeneously (especially with regard to the terms "learning goals" and "mastery goals"), on the level of contextual goal structures the term "mastery goal structure" is uniformly used in the literature.

formance goal structures lead to maladaptive outcomes on the part of the students. Most important in the present context are associations between classroom goal structures and students' goal orientations, which, in turn, affect adaptive and maladaptive learning patterns (for an overview see Meece et al., 2006).

The aspects of teachers' instructional practices, which were found in prior work to be dependent on teachers' goal orientations, relate to the concept of perceived classroom goal structures. Butler and Shibaz (2008) focused on teacher support and inhibition of question-asking and help-seeking (as perceived by students), which can be understood as important instructional practices in setting up classroom goal structures (nonetheless only partially, as this narrow focus neglects several of the above described aspects of classroom goal structures). They found that a teachers' learning goal orientation is positively associated with support for question-asking and help-seeking, and that a teachers' performance avoidance goal orientation is negatively associated with this aspect (Butler and Shibaz identified the opposite pattern for inhibition of question-asking and help-seeking). Moreover, they found positive associations between teachers' performance avoidance goals and students' cheating. In two studies Retelsdorf et al. (2010) focused on associations between teachers' goal orientations and their self-reported use of mastery and performance practices, thus focusing the full breadth of the concepts of classroom mastery and performance goal structures. They found, that teachers who strongly pursued learning goals reported a more extensive use of mastery practices, and that teachers who strongly pursued performance goals reported a more extensive use of performance practices as well as a less extensive use of mastery practices in their classrooms. Moreover, the results of Retelsdorf et al. (2010) indicated that teachers with a strong work avoidance goal orientation reported a more frequent use of performance practices.

As an interim summary, what can be noted is that teacher goal orientations seem to have effects on instructional practices but one must also acknowledge that the existing studies suffer from a number of shortcomings and therefore more research is needed to qualify and understand these effects. Only one study focused on teachers' instructional practices in their full breadth (Retelsdorf et al., 2010), nevertheless the exclusive use of teacher self-reports could have led to an overestimation of associations, due to the several biases known for this type of measurement (e.g., shared method variance). Butler and Shibaz (2008), however, used student perceptions of teachers' instructional practices. Nevertheless, they focused only on a sub-aspect of instructional practices. Student motivation in a narrower sense has not yet been analyzed in dependence on teachers' goal orientations. Therefore, the perspective of the present paper on students' perceptions of classroom goal structures and students' goal orientations in dependence on teachers' goal orientations is novel, and has the potential to complement existing research literature. Until now, no evidence exists regarding teacher factors leading to certain student perceptions of classroom goal structures.

Mechanisms Underlying the Associations between Teachers' Goal Orientations and Instructional Practices

Beyond limitations located primarily on an empirical level, the assumed associations between teachers' goal orientations and their instructional practices are also challenged from a theoretical point of view. Prior work primarily substantiated a *generalization hypothesis*, which assumes corresponding associations: Teachers, who endorse learning goals for themselves, i.e., who aim to develop their own professional competences, are expected to apply a learning focus for their students too, i.e., are expected to emphasize learning goals and use mastery oriented instructional practices. On the other hand, it was expected that teachers who pursue performance goals for themselves, i.e., aim to demonstrate superior teaching competences or aim to avoid demonstrating inferior teaching competences, also exercise a performance focus in their classrooms, i.e., articulate performance goals and use performance oriented instructional practices. These correspondences can be justified with an assumed generalization of the motivational system created by teachers' self-directed goals to teachers' student-directed goals in terms of definitions of success, evaluation criteria, causal beliefs etc. Nevertheless, other, non-correspondent associations found in prior work can hardly be interpreted as an effect of the generalization of the motivational system (e.g., the effect of work avoidance goals on performance practices; Retelsdorf et al., 2010).

Therefore, other mechanisms must exist. We propose considering the functionality of instructional practices for goal attainment as the central and more general mechanism underlying the effects of teachers' goal orientations. This notion has its roots in general goal theory—here, a fundamental assumption is, that a certain goal increases the probability of a certain course of action if, and only if, the person appraises this course of action or its results as functional for the attainment of the goal at hand (e.g., Austin & Vancouver, 1996; Elliott & Dweck, 1988). We refer to this mechanism by using the term *functionality hypothesis*.

Under this functionality perspective, correspondences between teachers' goal orientations and their instructional practices are not as straightforward as they might appear. Teachers' learning goal orientation should enhance the realization of a mastery goal structure only to the extent that it allows for learning on the part of the teacher (and not on the part of the students), i.e., to the extent that it provides opportunities for the teacher to improve his or her professional competences. This may depend on the specific competence the teacher aims to expand (basically, the functionality of mastery practices is more self-evident for endeavors to expand pedagogical and pedagogical-content knowledge than for endeavors to expand subject matter content knowledge). On the other hand, teachers' performance goals should enhance the realization of a performance goal structure only to the extent that it allows the teacher to demonstrate his or her teaching competences or conceal his or her competence deficits. This may additionally depend on to whom he or she wants to appear competent, or avoid appearing incompetent, i.e., the addressees of his or her performance goals (e.g., students, principal, the acting teacher himself or herself).

Under a functionality perspective, non-correspondent associations can also be explained. Under the justifiable assumption that performance practices are less demanding for teachers (in terms of the required effort for their preparation and execution) than mastery practices, we predicted that performance practices are more functional, and mastery practices are less functional, for teachers' work avoidance goals (rf. Retelsdorf et al., 2010). Moreover, under the condition that teachers believe that a good

teaching performance is manifested in maximized competence improvements for a maximum number of students, and that a good classroom instruction is characterized by a strong mastery focus, it can be predicted that mastery practices are functional for the attainment of teachers' performance goals. However, under the condition that the teachers are convinced that a good teaching performance is manifested in emphasizing the performance aspect as well as the promotion of the best students, the correspondence between performance goals of teachers and performance-oriented instructional practices can be predicted. In the latter case, generalization and functionality hypotheses lead to identical predictions.

Moderators

Beyond the aforementioned assumptions regarding dependencies on the specific competence facets on which learning goals can be directed and the specific addressees of performance goals, we assumed that the functionality of specific instructional practices for the attainment of teacher goals are dependent on a series of beliefs and standards. Among them are beliefs and standards regarding the definition of teaching success (as illustrated in the example above), regarding incentive policies in the scholastic context, regarding the educational room for manoeuvring a teacher has in developing his or her students' abilities, or regarding one's own teaching capabilities. Accordingly, teacher beliefs and school-specific standards can be conceptualized as potential moderators of the effects teachers' goal orientations have on instructional practices. In the present work, it was not our intent to analyse these moderators in a comprehensive manner. Instead, we aimed to demonstrate that such moderation exists and focused on two potential moderators: implicit theories of teachers regarding the malleability of students' abilities and teachers' self-efficacy beliefs.

Dweck and Leggett (1988) introduced the concept of implicit theories regarding the malleability of abilities to explain adaptive vs. maladaptive patterns following failure. Their concept originally referred to actors' own abilities (intelligence) and in their model, two opposing theories are contrasted: Whereas some people hold an incremental theory of their abilities according to which own abilities are malleable through own efforts, others see their abilities as a fixed entity which cannot be changed. As empirical findings generally indicate, different implicit theories have different motivational, affective, cognitive and behavioural consequences—with the general pattern, that an incremental theory can function as a protector against maladaptive reactions and an entity theory has to be considered a risk factor for them (for an overview see Dweck & Molden, 2005). Leroy, Bressoux, Sarrazin and Trouilloud (2007) conveyed Dweck and Leggett's (1988) concept on teachers' implicit theories regarding the malleability of their students' abilities and provided evidence that teachers are more autonomy-supportive when they believe that the abilities of their students are malleable. Accordingly, we predicted that teachers generally use more mastery practices (autonomy-support can be conceptualized as one of them; rf. Ames, 1992) when they hold an incremental view of their students' abilities. Although this has not been analysed in prior research, it is more central for the present paper that these teacher beliefs may also moderate the associations between teachers' goal orientations and their instructional behaviours. For example, it could be predicted that the instructional practices teachers with a strong learning goal

orientation select in order to expand their own professional competences depend on their assumptions regarding the malleability of student abilities.

The concept of teachers' self-efficacy beliefs refers to teachers' future-directed beliefs regarding their capabilities to successfully accomplish instructional tasks (Woolfolk-Hoy, Hoy, & Davis, 2009). Previous research indicated that teachers with higher self-efficacy beliefs demonstrate more effective instructional behaviour (e.g., supporting learning instead of simply covering the curriculum, working longer with low-achieving students, selecting learning instead of performance goals; for an overview see Woolfolk-Hoy et al., 2009). Accordingly, for teachers' self-efficacy beliefs, a positive association with the use of mastery practices and a negative association with performance practices can be predicted. Previous research on these associations is scarce and limited to teacher self-reports (Wolters & Daugherty, 2007). Teachers' self-efficacy beliefs may also moderate associations between their goal orientations and their instructional practices. A potential moderation could occur because of the degree of risk-taking which is associated with different levels of teachers' self-efficacy (Woolfolk-Hoy et al., 2009). It may be that self-efficacious teachers select instructional practices which are characterized by a higher risk of failure but are more promising in terms of attaining a specific goal, while less self-efficacious teachers may select instructional practices which do not pose a high risk of failure, but are less effective in terms of the attaining the goal at hand.

Research Questions and Hypotheses

The primary research question of the present paper focusses on the relations between teachers' goal orientations, on the one hand, and students' perceptions of classroom goal structures (as valid indicators of teachers' instructional practices) and students' goal orientations (as central aspects of their achievement motivation), on the other. Beyond unconditional relationships between broad factors of teacher goal orientations (learning, performance approach, performance avoidance, work avoidance) and instructional practices and student motivation, we focussed on effects of specific sub-facets of teachers' goal orientations (with regard to the expansion of specific facets of professional competence and to specific addressees of performance goals) and potential moderators in terms of teacher beliefs (implicit theories, self-efficacy beliefs). Generally, we expected that the functionality of instructional practices for the attainment of teacher goals is the central mechanism underlying these associations, and that this mechanism is more suitable to explain them than the generalization of motivational systems implied by teachers' goal orientations. Specifically, we aimed to test the following hypotheses:

H1: Teachers' goal orientations are associated with their instructional practices (perceived classroom goal structures).

To start with, we expected positive associations between corresponding dimensions (learning goals with classroom mastery goal structure, performance goals with classroom performance goal structures; Butler, 2007; Butler & Shibaz, 2008; Retelsdorf et al., 2010) which are in line with both the functionality hypothesis and the generalization hypothesis. Additionally, we expected associations between non-corresponding dimensions which are in line with the functionality hypothesis, but not with the generalization hypothesis: 1) We expected that learning goal orientations are negatively associated with class-

room performance goal structures (because of their lower potential to expand teachers' competences). 2) We expected that work avoidance goal orientations are negatively associated with classroom mastery goal structure and positively associated with classroom performance goal structures (because performance practices are less demanding for teachers than mastery practices; rf. Retelsdorf et al., 2010). 3) We expected that performance goal orientations are associated with classroom mastery goal structure, without making a prediction regarding the direction of this association (because the realization of a mastery focus in the classroom can be more or less functional for demonstrating superior teaching competences). Additionally, we expected to find differential relationships for different goal orientation dimensions on the subordinated level.

H2: Associations between goal orientations of teachers and their instructional practices are moderated by teachers' beliefs (implicit theories regarding the malleability of students' abilities, self-efficacy beliefs for teaching).

From the functionality hypothesis (but not from the generalization hypothesis) we deduced that the associations between teachers' goal orientations and their instructional practices depend on the belief systems the teachers hold. Therefore, we predicted that these associations are moderated by teacher beliefs. However, due to an almost complete lack of knowledge on this aspect, we refused to make any predictions regarding the direction of moderation effects.

H3: Teachers' goal orientations are associated with their students' motivation (students' goal orientations). These associations are mediated through teachers' instructional practices.

Based on the extensive literature on the effects of classroom goal structures on students' motivation and learning behaviour (see Meece et al., 2006, for an overview), we predicted that the expected effects of teachers' goal orientations on perceived classroom goal structures would spread over to the motivation of their students. Our specific expectations were, therefore, analogous to those regarding Hypothesis 1.

Method

Procedure

We used a data set from a larger cross-sectional study in the subject of Mathematics, which included students and teachers who answered standardized questionnaires during regular lesson periods. Participation was voluntary for both the teachers and the students. Data were collected by trained research assistants.

Participants

In that study we recruited a total of 56 fifth to eighth grade classrooms in eight public and six private secondary schools in urban, sub-urban and rural areas with different socio-cultural structures in southern Germany. In the present analyses, we included those 46 classrooms in which the teachers agreed to complete the respective questionnaire. Among the students in these classrooms 77.9% chose to participate in the study. The resulting sample consists of 46 Mathematics teachers (mean age of 45.3 years; $SD = 9.20$; 69% female) and 930 of their students (mean age of 13.1 years; $SD = 1.01$; 47% female).

Measurements

We used teacher as well as student measures to adequately assess teachers' goal orientations and beliefs (teacher self-reports), teachers' instructional practices (student perceptions of classroom goal structures), and students' goal orientations (student self-reports).

Teachers' goal orientations. We measured teacher goal orientations with the questionnaire developed by Nitsche et al. (2011). It contains a uniform item stem ("In my vocation, I aspire …") and subscales for four broad goal orientation factors, namely learning goal orientation (9 items), performance approach goal orientation (12 items), performance avoidance goal orientation (12 items) and work avoidance goal orientation (3 items). The learning goal orientation scale consists of, on a subordinate level, three 3-item sub-factors, which reflect the goals to broaden the three main types of professional teacher competences proposed by Shulman (1986): pedagogical knowledge (sample item: "… to improve my pedagogical knowledge and competence"), subject matter content knowledge ("… to really comprehend the contents of my subject"), and pedagogical-content knowledge ("… to really comprehend the process of knowledge transfer in my subject"). The scales for the performance approach and performance avoidance goal orientations each consist of four 3-item sub-factors, which reflect relevant addressees of teachers' performance goals: colleagues ("… my colleagues to realize that I teach better than other teachers", "… to conceal from my colleagues when I do something less satisfying than other teachers"), school principal ("… my principal to realize that I teach better than other teachers", "… my principal not to believe I would master my job less sufficient than other teachers"), students ("… my students to realize that I teach better than other teachers", "… to conceal from my students when I do something less satisfying than other teachers") and the acting teacher him/herself ("… to prove myself that I teach better than other teachers", "… to not have to admit to myself when I do something less satisfying than other teachers"). The scale assessing teachers' work avoidance goal orientation ("… that the work is easy") does not consist of sub-factors. All items were rated on 5-point Likert type scales, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Internal consistencies of the four broad goal orientations were in the range of Cronbach's $\alpha = .78 - .91$; those of the 11 sub-scales in the range of $\alpha = .61 - .94$.

Teachers' implicit theories regarding students' abilities. Using three items of Dweck, Chiu and Hong (1995), we assessed the extent to which teachers implicitly believe that their students can expand their abilities in the subject of Mathematics. The items, which originally focused on one's own intelligence, were adapted so that they focused on the Mathematics abilities of students from the perspective of the teacher ("My students can learn new things in Mathematics, but they can't really change their basic abilities for Mathematics"). They were rated using 6-point Likert type scales, ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). The scale was recoded, so that a higher value represents a more incremental view. $\alpha = .87$.

Teachers' self-efficacy beliefs for teaching. Five items from the scale developed by Schwarzer and Hallum (2008) assessed teachers' self-efficacy beliefs regarding demands in the context of teaching ("When I try really hard, I am able to reach even the most difficult students"). Teachers gave their responses on 4-point Likert type scales, ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). $\alpha = .65$.

Students' perceptions of classroom goal structures. We measured students' perceptions of classroom mastery, perfor-

mance approach and performance avoidance goal structures with the respective scales of the Patterns of Adaptive Learning Scales (PALS; Midgley et al., 2000), which we adapted to the subject of Mathematics and extended in order to enhance reliability. The scales measuring mastery goal structure ("In our Math class, really understanding the material is the main goal"), performance approach goal structure ("In our Math class, getting right answers is very important") and performance avoidance goal structure ("In our Math class, it's important not to do worse than other students") consisted of 7, 6 and 8 items, respectively, which were rated on 5-point Likert type scales, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). α = .76 - .84.

Students' goal orientations. To assess students' goal orientations, we used an instrument well-established in Germany (Spinath, Stiensmeier-Pelster, Schöne, & Dickhäuser, 2002) which we adapted to the subject of Mathematics (item stem: "In Maths class I usually ···"). Learning ("··· want to learn as much as possible"), performance approach ("··· want to show that I am good at something"), performance avoidance ("··· don't want the other students to think I am stupid") and work avoidance ("··· want to keep my workload small") goal orientations were measured using 8, 7, 8 and 8 items, respectively. Students rated them on 5-point Likert type scales, ranging from 1 (*absolutely false*) to 5 (*absolutely true*). α = .81 - .85.

Missing Data and Analyses

We carried out the study on which the present analyses are based in two cohorts. In the first cohort (17 classrooms), a multi-matrix design was applied on the student level for economic reasons (Munger & Loyd, 1988). Here, we collected students' perceptions of classroom goal structures from (randomly selected) half of the students within each classroom, and students' goal orientations were assessed among the other half of the students. Such structurally incomplete designs reveal values similar to those from complete datasets (Smits & Vorst, 2007). In the second cohort (39 classrooms), however, complete assessments were made for all students. Moreover, we assessed teachers' goal orientations and beliefs in full, for all teachers in both cohorts. We imputed missing values due to the partially incomplete design and item non-response (less than 10% for all teacher and student items) using the expectation-maximization algorithm (see Peugh & Enders, 2004).

We conducted two-level modelling with HLM 6 (Raudenbush, Bryk, & Congdon, 2004) using restricted maximum likelihood estimation (students nested in teachers; intercept-as-outcome-models). We z-standardized all variables prior to analyses —consequently, the coefficients of fixed effects can be interpreted similarly to standardized regression coefficients.

Results

We observed significant and moderate variation between teachers for all perceptions of classroom goal structures (error-corrected intraclass correlations $ICC^* = .12 - .16$; $p < .001$). Moreover, we observed significant and small to moderate variation between teachers for students' learning, performance approach and performance avoidance goal orientations ($ICC^* = .05 - .15$; $p < .001$), but not for students' work avoidance goal orientation ($ICC^* = .02$; $p > .05$).

Relations between Teachers' Goal Orientations and Students' Perceptions of Classroom Goal Structures (Hypothesis 1)

In the first step, we analysed the effects of the four broad factors of teachers' goal orientations on their students' perceptions of the classroom goal structures (**Table 1**). We deleted predictors with relationships in the direction opposite to those of the respective bivariate correlations and non-significant predictors stepwise from the models in order to avoid problems stemming from multicollinearity. As predicted, classroom performance goal structures (approach and avoidance) were positively predicted by teachers' performance avoidance goal orientations (performance avoidance goal structure: $p = .09$) and negatively predicted by teachers' learning goal orientations. Moreover, in accordance with our expectations, teachers' work avoidance goal orientations were a negative predictor of classroom mastery goal structures. Additionally, we observed a positive effect of teachers' performance approach goal orientation on classroom mastery goal structure. However, some expected effects could not be safeguarded; particularly worth mentioning is that no unconditional effect of teachers' learning goals on classroom mastery goal structures could be proven.

In the second step, we replaced the significant predictors in the models with the respective sub-factors (i.e., with the three competence-specific sub-factors of learning goals and the four addressee-specific sub-factors of performance goals, respectively) to gain information on which specific aspects of teachers' goal orientations are responsible for certain classroom goal structures. This in-depth analysis revealed that teachers' performance goals which are addressed to themselves (i.e., the goal to demonstrate to oneself, that one teaches better than other teachers) are exclusively responsible for the positive effect of teachers' performance approach goals on classroom mastery goal structures ($\beta = 0.09$; $SE = 0.05$; $p = .05$), while teachers' performance goals which are directed towards external addressees had no effect. With respect to classroom performance goal structures, we observed a similar pattern for both performance approach and performance avoidance goal structures: Responsible for the positive effects of teachers' perfor-

Table 1.
Two-level prediction of students' perceptions of classroom goal structures from teachers' goal orientations.

Predictor: Teachers' Goal Orientations (Level 2)	Students' perceptions of classroom goal structures		
	Mastery goal structure	Performance approach goal structure	Performance avoidance goal structure
Learning goals	-	−0.10[*] (0.05)	−0.11[*] (0.05)
Performance approach goals	0.11[*] (0.04)	-	-
Performance avoidance goals	-	0.11[*] (0.06)	0.09[+] (0.06)
Work avoidance goals	−0.11[*] (0.05)	-	-
$R^2_{Between}$	.14	.10	.08

Note: All variables were *z*-standardized prior to analyses. Predictors were grand-mean centered. Presented are regression coefficients β and standard errors (in parentheses). [*]$p < .05$. [+]$p < .10$.

mance avoidance goal orientations were performance avoidance goals which are addressed to the principal (Performance approach goal structure: $\beta = 0.16$; $SE = 0.07$; $p < .05$. Performance avoidance goal structure: $\beta = 0.11$; $SE = 0.07$; $p = .06$) and to their students (Performance approach goal structure: $\beta = 0.17$; $SE = 0.06$; $p < .01$. Performance avoidance goal structure: $\beta = 0.21$; $SE = 0.06$; $p < .01$), but not performance avoidance goals which address their colleagues or themselves. Moreover, the analyses revealed that teachers' learning goals directed towards the expansion of their pedagogical knowledge (Performance approach goal structure: $\beta = -0.12$; $SE = 0.07$; $p < .05$. Performance avoidance goal structure: $\beta = -0.14$; $SE = 0.08$; $p < .05$) and their pedagogical-content knowledge (Performance approach goal structure: $\beta = -0.12$; $SE = 0.06$; $p < .05$. Performance avoidance goal structure: $\beta = -0.11$; $SE = 0.07$; $p < .05$) were significant negative predictors of perceived classroom performance goal structures, while teachers' learning goals directed towards the expansion of their content knowledge were not.

Moderators of the Relations between Teachers' Goal Orientations and Students' Perceptions of Classroom Goal Structures (Hypothesis 2)

We calculated product terms by multiplying the z-scores of each of the four broad goal orientation factors with the z-scores of each of the two potential moderators (Cohen, Cohen, West, & Aiken, 2003). Multilevel models were extended on level 2 with those product terms which proved to be significant in a series of preliminary analyses (additionally with the corresponding unconditional variables).

With respect to classroom mastery goal structure, the analysis revealed a significant moderator effect of teachers' learning goals and their implicit theories ($\beta = 0.09$; $SE = 0.04$; $p < .05$), which is illustrated in **Figure 1**. Teachers with an incremental view of their students' abilities realized a slightly stronger classroom mastery goal structure when they pursued learning goals to a stronger extent, while teachers with an entity view demonstrated a weaker mastery goal structure in their classrooms with increasing learning goals. Additionally, a significant positive main effect of teachers' implicit theories on perceived classroom mastery goal structure was observed ($\beta = 0.11$; $SE = 0.06$; $p < .05$). With these effects, the explained between-teacher variance of perceived classroom mastery goal structure increased from $R^2 = .14$ to $R^2 = .23$.

For classroom performance approach and avoidance goal structures, we identified interaction effects between teachers' work avoidance goals and their implicit theories (Performance approach goal structure: $\beta = -0.13$; $SE = 0.05$; $p < .05$. Performance avoidance goal structure: $\beta = -0.15$; $SE = 0.05$; $p < .01$). While teachers' work avoidance goals had no, or even slightly negative, effects on classroom performance goal structures when they viewed their students' abilities as malleable, stronger classroom performance goal structures were perceived with increasing work avoidance goals when teachers had an entity view (**Figure 2**). Moreover, we observed an interaction effect between teachers' performance avoidance goals and their self-efficacy beliefs for both classroom performance approach and avoidance goal structures (Performance approach goal structure: $\beta = -0.18$; $SE = 0.07$; $p < .05$. Performance avoidance goal structure: $\beta = -0.21$; $SE = 0.07$; $p < .01$). Teachers with strong self-efficacy beliefs tended to realize weaker classroom
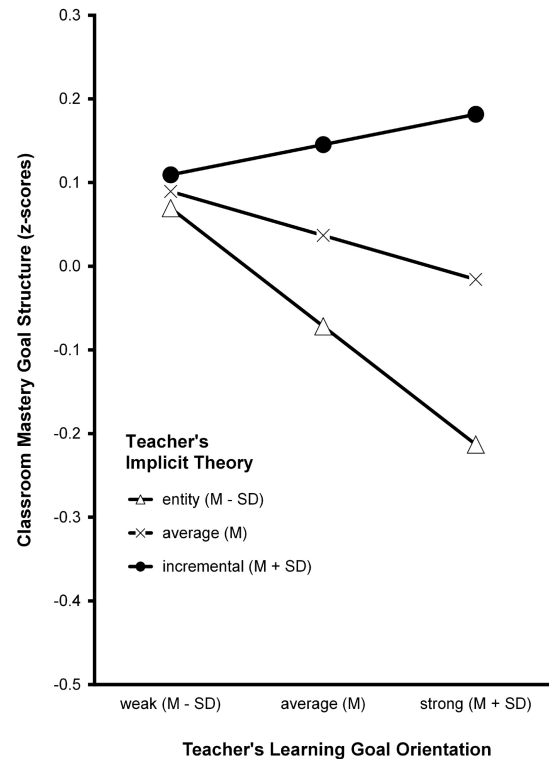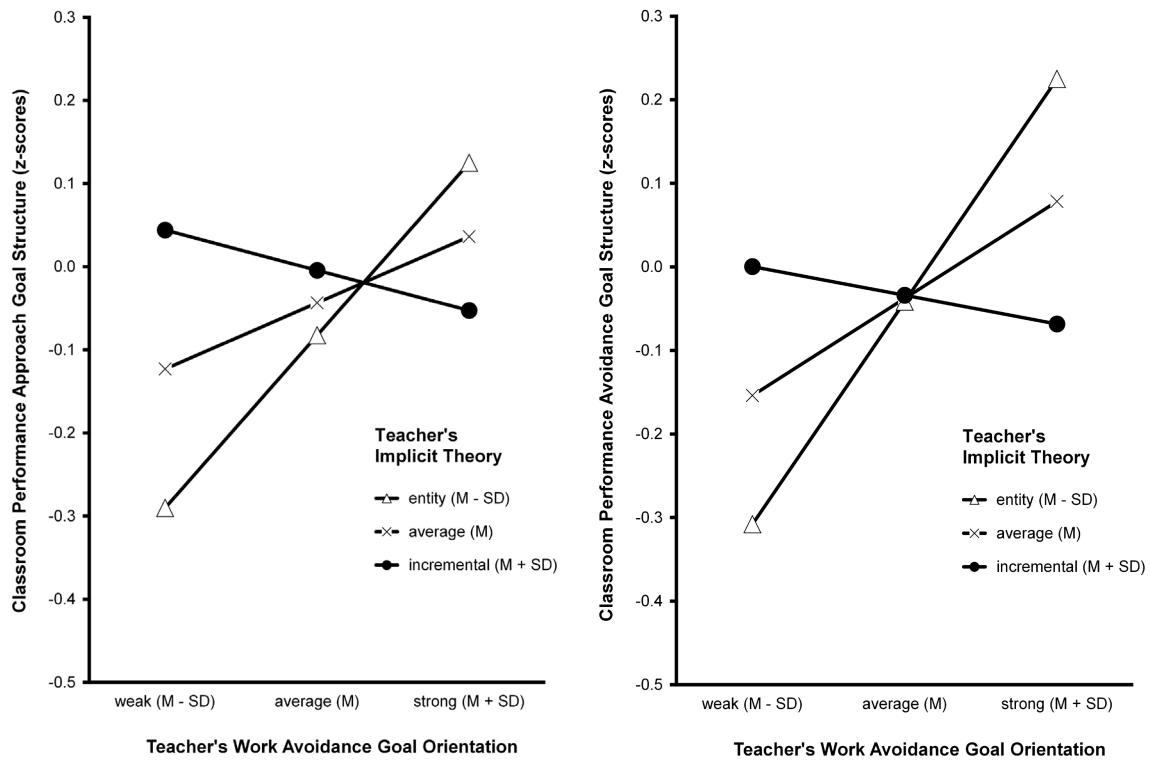

Figure 1.
Moderation of the association between teachers' learning goal orientations and students' perceptions of classroom mastery goal structure by teachers' implicit theories regarding the malleability of students' abilities (predicted values).

performance goal structures when they increasingly took aim to avoid demonstrating inferior teaching performances (**Figure 3**). In contrast, teachers with weak self-efficacy beliefs realized stronger classroom performance goal structures with increasing performance avoidance goals. Independent of these moderator effects, no significant main effects of teachers' implicit theories and self-efficacy beliefs were evident ($|\beta| < .07$; $p > .10$). Extending the multilevel models with these moderator effects increased the proportions of explained between-teacher variance from $R^2 = .10$ to $R^2 = .23$ and from $R^2 = .08$ to $R^2 = .30$ for perceived classroom performance approach and avoidance goal structure, respectively.
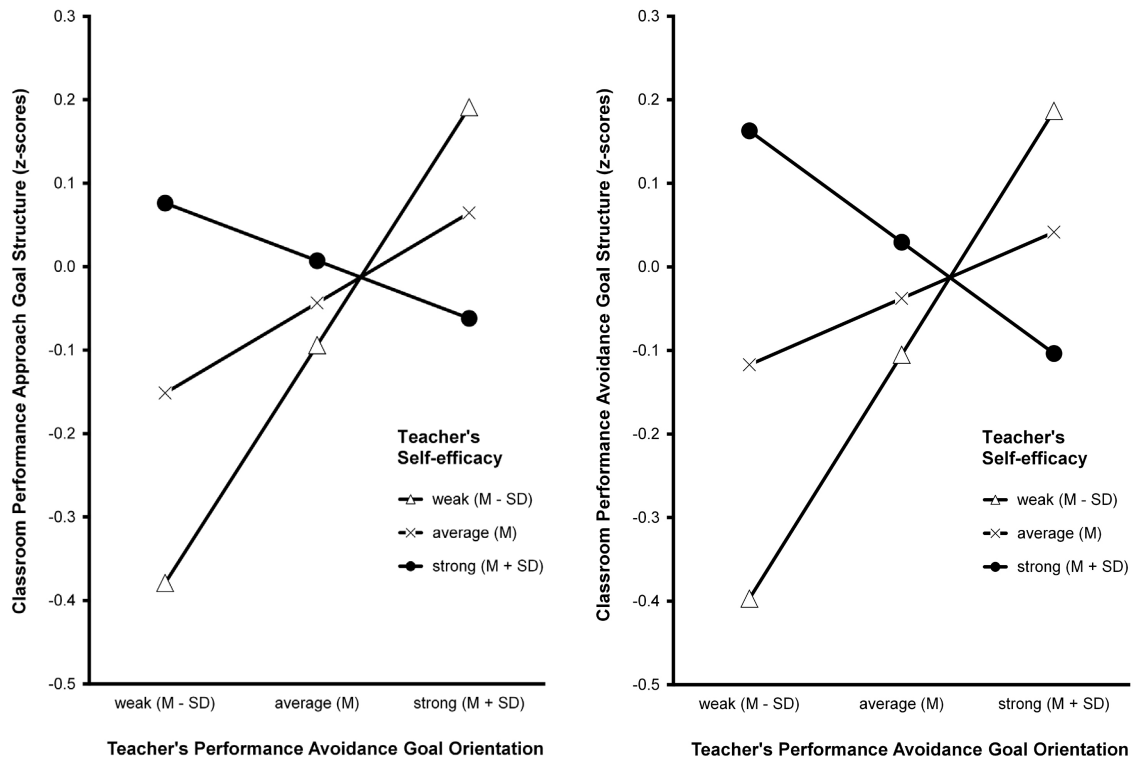
Relations between Teachers' and Students' Goal Orientations (Hypothesis 3)

We examined the effects of teachers' goal orientations on students' goal orientations with two modelling steps (**Table 2**)[4]. First, we identified the factors of teachers' goal orientations that are relevant for student motivation as we did for classroom goal structures (Model 1). Second, we inserted students' perceptions of classroom goal structures into the models on both the aggregated teacher level and the level of the individual student (Model 2). We did this in order to examine whether any effects of teachers' goals on students' goals were mediated by the instructional practices of the teachers in terms of the goal struc-

[4]We excluded students' work avoidance goal orientations from this analysis since no significant between-teacher variation was observed for them (as reported above).

Figure 2.
Moderation of the associations between teachers' work avoidance goal orientations and students' perceptions of classroom performance approach and avoidance goal structures by teachers' implicit theories regarding the malleability of students' abilities (predicted values).

Figure 3.
Moderation of the associations between teachers' performance avoidance goal orientations and students' perceptions of classroom performance approach and avoidance goal structures by teachers' self-efficacy beliefs for teaching (predicted values).

Table 2.
Two-level prediction of students' goal orientations from teachers' goal orientations and perceived classroom goal structures.

	Students' goal orientations					
	Learning goals		Performance approach goals		Performance avoidance goals	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Teachers' goal orientations (Level 2)						
Learning goals	-	-	-0.11^* (0.04)	-0.03 (0.03)	-0.07^+ (0.05)	-0.01 (0.02)
Performance approach goals	0.20^* (0.04)	0.10^* (0.03)	-	-	-	-
Performance avoidance goals	-	-	0.09^* (0.04)	0.02 (0.03)	-	-
Work avoidance goals	-0.10^* (0.06)	-0.01 (0.03)	-	-	-	-
Students' perceptions of classroom goal structures						
Between teacher level (Level 2)						
Mastery goal structure		0.32^* (0.03)		0.10^* (0.03)		-0.00 (0.02)
Performance approach goal structure		0.07 (0.08)		0.14^* (0.06)		-0.01 (0.07)
Performance avoidance goal structure		0.04 (0.08)		0.07 (0.06)		0.28^* (0.08)
Within teacher level (Level 1)						
Mastery goal structure		0.45^* (0.04)		0.16^* (0.04)		-0.10^* (0.03)
Performance approach goal structure		0.17^* (0.04)		0.47^* (0.05)		0.19^* (0.07)
Performance avoidance goal structure		-0.11^* (0.05)		0.08^+ (0.05)		0.47^* (0.06)
R^2_{Between}	.29	.96	.32	.86	.03	.99
R^2_{Within}	.00	.23	.00	.32	.00	.35

Note: All variables were z-standardized prior to analyses. Predictors on level 2 were grand-mean centered and predictors on level 1 were group-mean centered. Presented are regression coefficients β and standard errors (in parentheses). $^*p < .05$. $^+p < .10$.

tures they realized in their classrooms.

Estimating Model 1 revealed results which were, overall, quite similar to those for classroom goal structures. Students' learning goals were positively predicted by teachers' performance approach goals and negatively predicted by teachers' work avoidance goals. Students' performance approach goals were positively predicted by teachers' performance avoidance goals and negatively predicted by teachers' learning goals. However, for students' performance avoidance goals only one effect on the 10%-level of significance was observed: They were negatively predicted by teachers' learning goals ($p = .08$).

Inserting students' perceptions of classroom goal structures led to an almost total explanation of between-teacher differences in students' achievement goals. The pattern of associations on the between-teacher and within-teacher levels was, generally speaking, in accordance with findings of prior research (Meece et al., 2006). Two-level mediation testing (Krull & MacKinnon, 2001) confirmed that the effects of teachers' performance approach and work avoidance goals on students' learning goals were (partly) mediated by classroom mastery goal structure ($|z| > 2.08$; $p < .05$). Moreover, mediation testing revealed, at the 10%-level of significance, that the effects of learning and performance avoidance goals of teachers on performance approach goals of students were mediated by classroom performance approach goal structure ($|z| > 1.39$; $p < .08$). Finally, the negative association between teachers' learning

goals and students' performance avoidance goals was mediated by classroom performance avoidance goal structure ($z = 1.74$; $p < .05$).

Discussion

Overall, the present results support the presumption that teachers' instructional practices depend on their goal orientations (Hypothesis 1). We were able to resolve important limitations of the few prior studies on this topic (Butler & Shibaz, 2008; Retelsdorf et al., 2010) through operationalizing teachers' instructional practices by using students' perceptions of the broadly conceptualized and theoretically well-grounded dimensions of classroom goal structures (Meece et al., 2006); therefore, a unique contribution to the research literature on teacher motivation could be provided.

As expected, and in line with prior results based on teacher self-reports to measure instructional practice (Retelsdorf et al., 2010), teachers with a strong performance avoidance goal orientation realized strong classroom performance approach and avoidance goal structures. This correspondence may be an effect of the generalization of the motivational system which is associated with teachers' performance goals to standards in evaluating student achievement, the processing of student-related information and inferences regarding students' abilities. In addition, these correspondent associations are also in line with

the functionality hypothesis: The use of performance-oriented instructional practices can be an instrument for teachers who pursue the goal of avoiding having others recognize own poor teaching competences, for example, when they punish and thwart student errors in order to avoid deeper topic discussion and prohibit inferences regarding low teaching quality. An in-depth analysis of the addressee-specific performance avoidance goals further enlightened the positive effects of teachers' performance avoidance goals on perceived classroom performance goal structures. We observed consistent effects for performance avoidance goals, with which teachers aim to avoid appearing incompetent towards their students and the school principal. This pattern of results points to a possible combination of different mechanisms. While the effect of performance avoidance goals that teachers address to their students may be a result of both a generalization of motivational systems and appraisals of the functionality for goal attainment, the effect of performance avoidance goals teachers address to their principals can hardly be interpreted in terms of generalization. It can be better interpreted in terms of the functionality of good or, at least, not bad student performances which serves the goal to not appearing incompetent to the principal.

In contrast to prior results, we found, no support for the assumption that teachers' learning goal orientation is, in general, positively associated with the corresponding classroom mastery goal structure (instead, moderation was observed in this context —we will discuss this later). To explain this contradiction between previous findings and the present results, one can suspect that a common method bias (Retelsdorf et al., 2010) or focusing only a specific aspect of mastery practices (Butler & Shibaz, 2008) in prior research, may have led to an overestimation of the association.

In accordance with our predictions we observed a series of associations between non-correspondent goal orientations and classroom goal structure components which were only partly detected in prior research. As expected, teachers' learning goal orientations negatively predicted students' perceptions of both a classroom performance approach and a classroom performance avoidance goal structure. These effects, which are similar to the effects found by Butler and Shibaz (2008) for perceived teacher inhibition of question-asking and help-seeking, can be interpreted as a result of the small potential of performance-oriented practices to provide teachers with information regarding the effectiveness of their own instructional practices and, therefore, to expand teachers' competences. This functionality interpretation is strengthened by the result that the effect at hand was only associated with learning goals directed towards the expansion of pedagogical and pedagogical-content knowledge, but not with learning goals directed towards the expansion of content knowledge (Shulman, 1986), since it can be assumed that a low functionality of performance-oriented practices is given, especially for the two former competence facets. Moreover we observed, as expected, a negative effect of teachers' work avoidance goals on classroom mastery goal structure, which can be interpreted against the understanding that mastery-oriented practices are usually demanding in terms of the effort required for their preparation and execution (rf. Retelsdorf et al., 2010). Finally, we found evidence that teachers' performance approach goals have a positive effect on classroom mastery goal structures. In prior research the performance approach goals of teachers were often unrelated to their experiences and behaviours (e.g., Butler & Shibaz, 2008; Retelsdorf et al., 2010).

Under a functionality perspective we predicted such a relationship, nevertheless declining to make a prediction regarding its direction. The positive effect identified is plausible when one takes into account that teachers frequently define teaching success in terms of realizing strong instructional contexts to achieve competence development and mastery for all students. Under this definition of teaching success, the degree to which teachers realize a classroom mastery goal structure can actually be interpreted as an indicator of teacher performance. Therefore, realizing a classroom mastery goal structure should be seen as functional for the attainment of performance goals. Under this view, the positive effect of teachers' performance approach goals (which contradicts, in part, the results of Retelsdorf et al., 2010) is in accordance with the positive achievement effects of performance approach goals reported in the literature for students (Huang, 2012). In-depth analyses revealed that this effect is exclusively associated with teachers' self-addressed performance approach goals, i.e., goals with which they aim to excel in comparison to other teachers, but do not specifically aim to appear competent towards significant others. This is in accordance with findings of Ziegler et al. (2008) for students, indicating that self-addressed performance goals are associated with actual motivation and achievement more positively than others-addressed performance goals.

Overall, predicting perceived classroom goal structures from teachers' goal orientations without accounting for potential moderators led to relatively small proportions of explained criterion variance. Nevertheless, these proportions were in the range found in prior research (Butler & Shibaz, 2008; Retelsdorf et al., 2010).

As predicted only from a functionality perspective, we observed a series of moderator effects associated with aspects of the belief systems of teachers (Hypothesis 2). The observation of a small positive association between teachers' learning goals and a perceived mastery goal structure when teachers hold an incremental theory regarding student abilities, and a strong negative association when teachers hold an entity theory, could be interpreted in terms of the varying functionality of mastery-oriented instructional practices for the attainment of teachers' learning goals associated with different implicit theories. If they hold an incremental view, teachers should see teaching competences regarding the development of all students' abilities as most relevant. On the contrary, if they hold an entity view, they should see mastery-oriented strategies as less appropriate. Moreover, the predicted positive effects of work avoidance goals on classroom performance goal structures were observed only for teachers with an entity view of their students' abilities. Obviously, the instrumentality of performance-oriented practices for the aim of spending as little effort as possible in practicing the teacher profession is perceived and/or accepted to a lesser degree by teachers when they view the abilities of their students as more malleable and, therefore, may perceive a stronger responsibility for their students' competence development. Finally, interaction effects between teachers' performance avoidance goals and their self-efficacy beliefs were observed. The already discussed positive main effects of performance avoidance goals on perceived classroom performance goal structures were especially strong in the case of weak self-efficacy beliefs, and were absent in the case of strong self-efficacy beliefs. We interpret these moderator effects as an effect of the functionality of performance-oriented practices that varies with varying self-efficacy beliefs, because different

levels of self-efficacy are associated with different degrees of risk-taking. More specifically, we assume that teachers with both perceptions of weak teaching competences, as well as a strong focus on avoiding the demonstration of these weak competences, tend to see performance-oriented instructional practices as a relatively risk-free way to protect themselves against inferences by others regarding their own weak competences.

Accounting for moderator effects resulted in a remarkable increase in the proportions of explained between-teacher variance in students' perceptions of classroom goal structures. This underpins our assumption that effects of teacher goal orientations are frequently dependent on the beliefs of teachers and salient standards for teachers, and challenge theorists to concisely model the conditions under which certain goal orientations lead to certain instructional practices which lead, in turn, to certain qualities of student motivation and learning. It has, nevertheless, to be mentioned that the present research focused on only two potential moderators and other moderators may exist (e.g., definition of teaching success and incentive policies in the organizational/school context of teachers).

As a side result we could demonstrate, for the first time, that teachers use more mastery oriented practices when they hold an incremental view of student abilities (see Leroy et al., 2008).

With regard to the associations between teacher goals and student motivation we showed, in line with our expectations, that the impact teachers' goal orientations have on students' goal orientations is similar to the impact they have on classroom goal structures. This impact was, to the largest extent, mediated through instructional practices in terms of the goal structures the teachers realize in their classrooms (Hypothesis 3). The present work demonstrated, for the first time, the effects of teacher motivation on student motivation within the theoretical framework of achievement goal theory in a narrow sense. The direct (i.e., through classroom goal structures only partially mediated) effect of teachers' performance approach goals on students' learning goals may be a result of associations with the use of certain specific mastery-oriented instructional practices which are not examined in, or associated with, the concept and measure of perceived classroom goal structure used in the present work (Midgley et al., 2000). In general, we appraise the detailed analyses of associations between teacher goal orientations, specific dimensions of their instructional practices in relation to their realization of certain classroom goal structures (understood as a macroscopic or crystallized indicator of instructional practice), and student motivation as an important task of future research.

Overall, the present results strongly support the functionality hypothesis substantiated in this paper, i.e., the theoretical notion that effects of teachers' goal orientations on their instructional behaviour should be understood in terms of the functionality or instrumentality of the specific behaviour for the attainment of their personal goals. This is supported by a series of significant associations between non-correspondent goal orientations and classroom goal structure components, and a series of significant moderator effects according to which the strength and the directions of associations between teachers' goal orientations and classroom goal structures are dependent on the belief systems teachers hold. Both non-correspondent effects and moderator effects are not in accordance with the generalization hypothesis. As we argued, the functionality mechanism can be understood as being more general than the mechanism of gen-eralizing the motivational system implied by certain goal orientations. The correspondent associations predicted from an assumed generalization of motivational systems (i.e., positive associations of learning and performance goals with classroom mastery and performance goal structures, respectively) can also be explained through the functionality of the respective instructional practices for attaining the corresponding personal goal.

Limitations and Prospects for Future Research

Although significant limitations over prior studies could be resolved in the present study, namely the use of teacher self-reports, the narrow focus on specific aspects of instructional practice, the neglect of potential moderator effects, as well as specific facets of professional competences to which learning goals could be directed and specific addressees to which performance goals of teachers could be directed, some limitations do remain. Here, the relatively small sample on the teacher level has to be mentioned. This could have led to an oversight of (small) effects of teacher goal orientations. However, this does not place into question the identified effects. Their generalizability (at least for the population of mathematics teachers in secondary schools) is safeguarded through a relatively diverse sample of teachers and students from different contexts. Nevertheless, future research should be conducted in different school subjects and grade levels using larger samples on the teacher level. Additionally, the cross-sectional design of the present study has to be mentioned—in that causal inferences in a narrow sense are not justified. Indeed, the causal direction opposed to the causal direction that we theoretically assumed may also be (additionally) plausible, e.g., that teachers adapt their goal orientations to student characteristics. Disentangling potential recursive associations is a relevant and challenging task for future research. Nevertheless, for two reasons, the theoretically assumed causal direction interpreting the associations as effects of teachers' goal orientations is more likely: Firstly, because teacher goal orientations were measured generally without reference to the specific Mathematics classroom in which students' perceptions of instructional practices and goal orientations were assessed. Secondly, because perceived classroom goal structures would not be expected to function as (full) mediators in the case of bottom-up effects of student characteristics on teachers' goal orientations.

Conclusion

Despite these limitations, it could be concluded that the assumption that teachers' goal orientations affect their instructional practices also holds true when conceptualizing instructional practices in a broad and theory-driven manner (classroom goal structures) and when measuring them using student perceptions, which are more advisable in order to rule out potential biases of teacher self-reports. The present results provide evidence regarding the important, but widely unaddressed, question regarding the determinants of perceived classroom goal structures, which prevailed within the framework of achievement goal theory to describe differences between classrooms and proved to have important consequences in terms of student motivation, learning behaviour and achievement (Meece et al., 2006). It could be concluded that the effects of teachers' goal orientations on their instructional practices also spread over in effects on student motivation (i.e., their goal orientations).

Moreover, it could be concluded that the effects of teachers' goal orientations on their instructional practices are, in part, moderated by teacher beliefs. With respect to the underlying mechanisms it could be concluded that the effects of goal orientations of teachers are based, to a vast degree, on the functionality of certain instructional practices for the attainment of teachers' goals, whereas the assumption that a generalization of the motivational systems that goal orientations imply is responsible, at best, for a small proportion of the effects of teachers' goal orientations on their instructional practices and their students' motivation.

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