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# Goal orientations of teacher trainees: Longitudinal analysis of magnitude, change and relevance[1]

## Abstract

*The central focus of this paper is to address the magnitudes of and changes in four central components of teacher goal orientation (learning, performance approach, performance avoidance and work avoidance goal orientation) among prospective teachers. The findings reported here were gathered with a sample of 130 teacher trainees who responded to questionnaires at five measuring points over the course of the two years pre-service training which comprise the second phase of teacher education ("Referendariat"). Differential magnitudes and changes in teacher trainees' goal orientations were analyzed using a hierarchical linear modeling approach. Cluster analyses were able to identify three typical growth trajectory patterns in goal orientation which were differentially associated with achievement levels at the end of the second phase of teacher education, stress experiences, attitudes concerning help seeking, as well as dropout tendencies.*

## Keywords

*Goal orientations; Teacher trainees; Teacher education; Longitudinal study; Hierarchical linear modeling*

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# Zielorientierungen von Lehramtsanwärter(inne)n: Längsschnittliche Analyse von Ausprägung, Veränderungen und Relevanz


## Zusammenfassung

*Im Zentrum des vorliegenden Beitrags stehen die differentiellen Ausprägungen und Veränderungen der vier zentralen Komponenten der Lehrkraftzielorientierung von angehenden Lehrkräften (Lern-, Annäherungsperformanz-, Vermeidungsperformanz- und Arbeitsvermeidungszielorientierung). Berichtet werden die Befunde einer Stichprobe von 130 Lehramtsanwärter(inne)n, die im Laufe der zweijährigen zweiten Phase der Lehramtsausbildung („Referendariat") zu fünf Messzeitpunkten schriftlich befragt wurden. Individuelle Ausprägungen und Veränderungen der Zielorientierungen der angehenden Lehrer(innen) wurden mit Hilfe einer hierarchisch-linearen Modellierungsstrategie analysiert. Clusteranalytisch wurden drei typische Verlaufsmuster der Zielorientierungen identifiziert, die mit den Leistungen am Ende des Referendariats, dem Belastungserleben, den Einstellungen gegenüber Hilfe sowie der Abbruchtendenz im Zusammenhang standen.*



## Schlagworte

*Zielorientierungen; Lehramtsanwärter; Referendare; Lehrerbildung; Längsschnittstudie; Hierarchisch-lineare Modellierung*


## 1. Introduction

Research in educational psychology has provided a wealth of evidence which shows that the goals which individuals pursue in social learning and achievement contexts have an influence on their behavior and experiences (for an overview see Schunk, Pintrich, & Meece, 2008). The goal orientations pursued by students and the effects they have on their motivation and achievement have been particularly well researched and empirically documented. Recently, increasing numbers of empirical findings have indicated that the achievement goal theory can be a productive concept for both describing and explaining teacher motivation. However, these results are based primarily on cross-sectional studies.

The aim of the present study was to investigate the – inter-individually different – magnitudes of, and changes in, goal orientation among teacher trainees in the second phase of German teacher education.[2] A further aim was to investigate whether typical trajectories could be identified for goal orientations within the two year phase, and whether they are related to achievement, perceived stress experiences, attitudes concerning help seeking and the tendency to drop out of the teacher education program.

2 In Germany, teacher education is subdivided into three distinct phases: (1) a course of studies completed at a university, (2) subsequent 2-year practical training in pre-service teacher training at schools ("Referendariat"), and (3) further education for in-service teachers.

## 1.1 Goal orientations in social learning and achievement contexts

Although the definitions expressed in the literature are not fully consistent, there is a broad general agreement that goal orientations have to be conceptualized as relatively stable motivational orientations which can influence behavior and actions in social learning and achievement contexts (cf. Elliot, 2005; Kaplan & Maehr, 2007). They encompass the cognitive representation of one's purpose for engaging in learning and achievement settings. Differentiations between learning goal orientation and performance goal orientation are marked (cf. Elliot, 2005; Kaplan & Maehr, 2007). A learning goal orientation is defined as a person's focus on developing their own competencies or skills. In contrast, a performance goal orientation is defined as a focus on demonstrating one's own competencies and high ability levels in comparison to others, which are referred to as approach-performance goals, as well as a focus on hiding any lack of competencies and abilities, referred to as avoidance-performance goals (e.g. Elliot & Harackiewicz, 1996). Some authors (e.g. Nicholls, 1984) indicate the presence of an additional class of goals, the so-called work avoidance goals, whereby the avoidance of work and effort stands in the foreground in learning and achievement situations. So far, primarily, the goal orientations of students have been subjected to investigative efforts (for an overview see Schunk et al., 2008). Both the correlative as well as the experimental research on goal orientations among students has demonstrated that a learning goal orientation, in comparison to a performance goal orientation, is associated with more beneficial attributions for success and failure, more positive affects when working through learning tasks and performance tasks, increased intrinsic motivation and greater interest in the learning objective as well as more intensive involvement with the learning material, more suitable working strategies and better endurance (e.g. Harackiewicz, Barron, Tauer, Carter, & Elliot, 2000; Linnenbrink, 2005; Meece, Blumenfeld, & Hoyle, 1988; Middleton & Midgley, 1997; Wolters, 1998). The effects of performance goal orientations need to be understood differentially: While a positive relationship can often be identified between a performance approach goal orientation and achievement, empirical findings have demonstrated that a performance avoidance goal orientation has negative effects on current motivation, emotional experience as well as learning behaviors and performance rates among students (e.g. Elliot & Sheldon, 1997; Middleton & Midgley, 1997; Midgley, Kaplan, & Middleton, 2001; Pintrich, 2000). Furthermore, a high work avoidance goal orientation goes hand in hand with poor academic performance (e.g. Archer, 1994; Dupeyrat & Mariné, 2005; Nicholls, Patashnick, & Nolen, 1985; Skaalvik, 1997). It should also be emphasized that the individual goal orientations are not mutually exclusive, and that individuals hold different combinations of goal orientations (e.g. Pintrich, 2000).

Evidence pertaining to development and changes in goal orientations is available for students in school and university settings (see Anderman, Austin, & Johnson, 2002, for an overview). The existing literature indicates that goal orien-

tations, despite their relative stability, often change when contextual conditions change, for example after the transition from one educational setting to another (e.g. Anderman & Anderman, 1999). Moreover, findings indicate that these changes in goal orientations frequently comprise shifts from adaptive to maladaptive patterns (mainly declines in learning goals and increases in performance goals) which also can be seen as an effect of changing contextual conditions such as goal structures in classrooms (e.g. Anderman & Anderman, 1999; Anderman & Midgley, 1997). Nevertheless, research also indicate large inter-individual differences not only in the magnitudes of goal orientations, but also with respect to developmental trajectories, which can be interpreted as effects of inter-individual differences in the effectiveness of adaptations to conditions associated with contexts and tasks (e.g. Fryer & Elliot, 2007).

## 1.2 Goal orientations of teachers and teacher trainees

Recent studies have shown that transferring the concept of goal orientation to the population of teachers and prospective teachers is promising in terms of describing and explaining their motivation and experiences in the school and classroom contexts (Butler, 2007; Dickhäuser, Butler, & Tönjes, 2007; Malmberg, 2006; Papaioannou & Christodoulidis, 2007; Retelsdorf, Butler, Streblow, & Schiefele, 2010; Tönjes & Dickhäuser, 2009; Tönjes, Dickhäuser, & Kröner, 2008). A transfer of the achievement goal theory to the teaching profession is based on the following premises: First, (prospective) teachers are exposed to a diverse set of performance requirements. According to Butler (2007), the school and instruction encompass an "Achievement Arena" not only for students, but for teachers as well (p. 242). Consequently, it is presumed that teachers pursue the goals – inter-individually to different degrees – of demonstrating good (teaching) performances (performance approach goals) or, as the case may be, avoiding poor (teaching) performances (performance avoidance goals). Second, it is expected that they pursue the goal, to different extents, of broadening their professional competences (learning goals). While it seems obvious that many prospective teachers (enrolled in the formalized learning setting of practical pre-service teacher training) pursue the goal of developing their professional competences, this seems less obvious for practicing teachers who have already finished their formal teacher education. Nevertheless, it can also be assumed that at least a considerable proportion of teachers are committed to mastery goals (e.g. continuous advancement of their teaching competences) since they agree that the ongoing acquisition of knowledge and professional skills is crucial to improve teaching (cf. Borko, 2004). Third, it is assumed that different teachers strive, to varying degrees, to limit the efforts they have to make, and to reduce their daily professional workload as much as possible (work avoidance goals). Accordingly, it can be assumed that the four goal orientations listed above also vary among teachers and teacher trainees and that they elicit different experiences and behaviors.

Butler (2007) empirically investigated the structure of teacher goal orientations with a sample of 320 Israeli teachers. Her findings indicated that the four qualitatively different goal orientations named above could be differentiated (see also Papaioannou & Christodoulidis, 2007, for similar evidence regarding differentiations on several facets of teacher goal orientations). The teachers in Butlers sample agreed most with mastery and least with work-avoidance goals. Moreover, Malmberg's (2006) results, which are based on two samples of participants in university's teacher education studies, also provided evidence for the discriminative validity of the goal orientation construct. His results underpinned the assumption that goal orientations are distinguishable and meaningful components of teacher motivation (although they indicated small to moderate associations between goal orientations and intrinsic vs. extrinsic teaching motivation, which were in line with theoretical predictions).

Butler (2007) also examined the relationships between these four goal orientations and the experiences and behaviors of teachers. Of particular interest to her were relationships between goal orientations and the attitudes expressed by teachers with regard to offers of assistance as well as the actual utilization of assistance. It was found that teachers who demonstrate a strong learning goal orientation value assistance as a good opportunity to broaden their competences and find it a good way to make their profession more interesting. On the other hand, teachers who showed a strong performance avoidance goal orientation seldom took advantage of help and understood help, more than other teachers, as an indicator of insufficient abilities and a threat to self-esteem. In addition, a strong work avoidance goal orientation was associated with the perception of help as additional effort. Dickhäuser et al. (2007) were able to confirm these relationships using a sample of 226 German teacher trainees. Taking into account that teachers should continuously work to further develop their professional skills and their own professional demeanor, and that taking advantage of assistance can be (part of) an effective strategy to achieve this, it is clear that a strong learning goal orientation represents a favorable premise for teachers in the development of professional competences, even after entry into the profession. Furthermore, a strong performance avoidance goal orientation can be understood as a risk factor for detrimental skill development over the course of one's professional life.

Initial indications have also suggested that different professional goal orientations among teachers are also associated with different professional stress experiences and different levels of job satisfaction (see Maslach & Leiter, 1999). Tönjes et al. (2008) were able to show that among teachers, the combination of a strong performance avoidance and a weak performance approach goal orientation is associated with a strong "perceived lack of personal accomplishment" (a significant component of professional stress experience), also after statistically controlling for the influence of personality characteristics (such as neuroticism). Moreover, findings by Papaioannou and Christodoulidis (2007) indicated that a weak learning goal orientation and a strong performance avoidance goal orientation are related to weak job satisfaction among teachers.

In summary, it can be stated that the achievement goal theory provides a suitable model to describe teacher motivation. Findings up to this point support the assumption that different goal orientations among (prospective) teachers are differentially associated with actions taken towards the development of professional competences, and correlate differentially with professional stress experiences. Across all of the criteria named here, a strong learning goal orientation has proven to be beneficial and a strong performance avoidance goal orientation has proven to be detrimental. Nevertheless, the current state of research on the topic is still incomplete in many respects: The reported findings are based, in most cases, on cross-sectional studies. Longitudinal findings on teacher goal orientations have been rare in the research literature (for an exception see Tönjes & Dickhäuser, 2009). Similarly, there has been a lack of investigations into goal orientations among teacher trainees, i.e. prospective teacher in pre-service teacher training, the second phase of teacher education.

In Germany, pre-service teacher training incorporates the transfer from the more theoretically oriented education one receives at university to classroom practice and the personal responsibility it entails. It represents a stage of a teacher's personal development which is highly prone to crisis (Schedensack, 1995), whereby premature termination is not uncommon. When discussing reasons, teacher trainees often point to the seemingly inherent pressure to perform they experience during pre-service teacher training and the strain of being solely and personally responsible for the instruction being implemented in their classrooms (cf. Oesterreich, 1987; Ulich, 1996). Particularly in pre-service teacher training, prospective teachers are requested to reflect on their instructional methods and what they can do to improve them on this basis. Consideration of their own instructional behaviors from a meta-perspective becomes familiar to the prospective teachers and enables them to use experiences gained in instruction to learn new things for themselves (Tönjes et al., 2008). For a good portion of their working day, teacher trainees are under the observation of students, which in turn raises their focus on being evaluated (Cottrell, 1972). Thus, in addition to the intention of instructing, teacher trainees are most likely to also – to different degrees – pursue the goal of demonstrating competence, or, as the case may be, conceal lacks of competence (cf. Tönjes et al., 2008). This is particularly significant in that teacher trainees are frequently assessed as to how successful they are at teaching.

## 1.3 Research questions

The central concern of this paper is directed towards an investigation of the (differential) magnitudes of, and changes in, the four central components of goal orientation (learning, performance approach, performance avoidance, work avoidance) among prospective teachers. Moving forward from the previous research presented here, the following specific research questions will be pursued:

(1) How strong are the magnitudes of individual goal orientations among teacher trainees on average, and which average changes emerge over the course of the two year, second phase of teacher education? To what extent do inter-individual differences exist (in magnitude and in change)?

(2) What sorts of typical growth trajectory patterns for goal orientations among teacher trainees can be identified within the two year phase?

(3) Are typical growth trajectory patterns connected in a specific manner with attitudes concerning help, perceived stress experiences, the tendency to terminate the teacher training program, and achievement in the pre-service training? Also when relevant predictors (university exam grades, ability self-concept, personality) are being controlled for?

Based on the existing literature on students' achievement goals and their contextual determinants, we expected significant changes in teacher trainees' goal orientations due to the specific demands of pre-service teacher training which differ heavily from the demands of the previous phase of teacher education at university, and which also vary over the course of the two year training (e.g. increase of instruction with sole responsibility; cf. Anderman & Anderman, 1999). Moreover, we expected considerable inter-individual differences, not only in the magnitudes but also for changes in goal orientations resulting in more and less adaptive growth trajectory patterns, since we assume variability in the effectiveness of adaptation to contextual demands (cf. Fryer & Elliot, 2007). Finally we expected, correspondent to the existing achievement goal literature, that more adaptive patterns of goal change are associated with more adaptive outcomes than with less adaptive patterns of goal change (cf. Anderman et al., 2002).

## 2. Method

### 2.1 Procedure and participants

At five measuring points (T1 to T5) over the two year course of the second phase of German teacher education, teacher trainees completed standardized questionnaires. The first survey (T1) was conducted immediately after the start of pre-service teacher training. T2, T3 and T4 were each conducted after the starts of the second, third and fourth training semesters, respectively. The last survey (T5) was conducted at the last point of contact with the teacher trainees, during a (voluntary) final meeting.

Teacher trainees were recruited for participation in the study at nine traineeship institutions for prospective secondary school teachers via the directors of these institutions. Participation was voluntary and anonymous. In order to ensure the anonymity of the participants, undisclosed personal codes were utilized. Teacher trainees were not rewarded for participation.

A total of 199 secondary school teacher trainees participated in the investigation. The current analyses include those $N$ = 130 teacher trainees who had taken part in at least two of the surveys on which goal orientations had been assessed (T1 through T4). This sample consists of 81 female and 49 male teacher trainees. Their mean age was 33.0 years at T1 ($SD$ = 7.83). Although this mean age seems to be relatively high, it is quite representative since a substantial number of teacher trainees in Germany are career changers. In the traineeship institutions teacher trainees were generally trained in two teaching subjects, whereby a broad spectrum of subjects were represented in our sample. The most frequent subjects were: German (33% of teacher trainees had this subject as one of their two subjects), Mathematics (30%), Technology (19%), Biology (15%), English (14%), Physics (13%), religious education (11%), and Physical Education (10%).

At T1 to T4, completed questionnaires were available for 96%, 88%, 82% and 78% of the sample, respectively. Due to the fact that the survey conducted at T5 occurred outside of the framework of the compulsory traineeship schedule, the completion rate here is only 34%. Fifteen percent of the teacher trainees participated at two, 18% at three, 40% at four, and 27% at five of the measuring points. These participation rates resulted in an overall unit non-response rate of 24% over all measuring points.

Missing data, due to unit non-response at single measuring points as well as item non-response,[3] were estimated using the expectation maximization (EM) algorithm (cf. Peugh & Enders, 2004) and all analyses were based on the completed data. As a maximum likelihood estimation procedure, the EM-algorithm identifies population parameters which are most likely to have produced the specific attrited sample of measurements. In particular when missing data does not occur randomly or infrequently (both are common in longitudinal studies, e.g. due to systematic drop-out), the EM-algorithm has a series of advantages in comparison to traditional methods such as list-wise or pair-wise deletion, mean imputation or regression estimation (cf. Peugh & Enders, 2004; Schafer & Graham, 2002). Most important, it produces less biased means, variances and covariances since it uses all available information. Standard errors are also less biased. Moreover, this method prevents the loss of power resulting from a diminished sample size and maintains high precision.

## 2.2 Measuring instruments

### 2.2.1 Goal orientations

In order to assess the goal orientations of the teacher trainees at measuring points T1 to T4, the scales to assess professional goal orientations of teachers developed

3 None of the items demonstrated a missing value rate of more than 6%. One lone exception was the exam grades reported for university studies, whereby 25% of the values were missing.

by Dickhäuser et al. (2007) were used. Responses to the items were made along an answer scale which ranged from 1 (*absolutely false*) up to 5 (*absolutely true*). The eight item scale "Learning goal orientation" was used to assess the degrees to which teachers strived to broaden their competences, within the scope of managing their teaching duties (sample item: "When I am instructing my students, my intention is to learn as much about instructing as possible"; Cronbach's α = .72–.85; *Md* = .79). By using the seven item scale "Performance approach goal orientation" assessments were made as to how strong teachers tended to demonstrate their own competences ("When I am instructing my students, my intention is to demonstrate that I can teach well"; α = .70–.83; *Md* = .80). The scale "Performance avoidance goal orientation" contained eight items and assessed the degrees to which teachers intended to conceal their weaknesses and hide their deficits in performance situations ("When I am instructing my students, my intention is to not disgrace myself in front of the class"; α = .74–.85; *Md* = .82). Finally, with the eight item scale "Work avoidance" the tendency to do as little work as possible was assessed ("In my role as a teacher, my intention is to get through the school day with as little work as possible"; α = .83–.89; *Md* = .86).

### 2.2.2 Dependent variables

In accordance with Research Question 3, a series of variables were assessed under the assumption that they were associated with potential changes in goal orientations among teacher trainees.

In the operationalization of *achievement* we used the average of the final grades for pre-service teacher training. These were recorded on the final certificates awarded by the two persons responsible for the two school subjects led by the trainee ("Fachleiter(in)") as well as the director of the traineeship institution ("Hauptseminarleiter(in)") (α = .96). These grades were obtained from the teacher trainees at the fifth measuring point. The resulting variable was recoded, so that a high value corresponds to a high level of achievement.

In order to formulate an indicator for *professional stress experience* at the end of the teacher training phase, a German version of the Maslach Burnout Inventory (MBI), developed by Schmitz (1999), was administered at T4, which assessed three components of stress experiences: emotional exhaustion (9 items, "My work leaves me feeling exhausted"), perceived lack of accomplishment (8 items, "I feel full of drive and energy") and depersonalization (5 items, "With regard to some students, I basically don't care what becomes of them"). All items were answered along a four-point rating scale ranging from 1 (*absolutely incorrect*) to 4 (*absolutely correct*). Internal consistencies ranged between α = .76 and α = .87. In order to generate a manageable single measure of stress experiences for the present analysis a composite of the three subscales was formed (consistency over the three scales: α = .79). Higher values here reflect more intense stress experiences.

In order to develop an indicator for an *adaptive attitude concerning help* as a dependant variable, three facets of this attitude were assessed at T4 using measuring instruments developed by Dickhäuser et al. (2007). The three individual facets, which were each assessed with four items along a five-point answer scale ranging from 1 (*absolutely false*) to 5 (*absolutely true*), reflect the degree of threat perceived by asking for help ("When I seek out help, as a teacher, this only shows that I have weaknesses"; α = .72), the perceived benefits of taking advantage of help ("Discussions with others concerning problems one may be facing is a good way to learn as a teacher and to become more professional"; α = .76), as well as the perceived work effort involved in seeking out help ("Advice and help often only wind up making the actual problems facing a teacher even more complicated"; α = .65). Once again, a mean value was generated to produce a global indicator which represents all three facets (α = .64). Before averaging, "threat perceived by asking for help" and "perceived work effort involved in seeking out help" were recoded. As a consequence, higher values on the global indicator reflect more adaptive attitudes concerning help seeking.

In order to assess the *dropout tendency* of the teacher trainees, at T4 the participants were asked to respond to the item "I am seriously considering resigning completely from the teaching profession" along a four-point answer scale ranging from 1 (*absolutely incorrect*) to 4 (*absolutely correct*). As the distribution was skewed, the drop-out tendency was dichotomized, with 0 reflecting no tendency to drop-out (lowest scale value) and 1 reflecting a drop-out tendency which was present to at least a certain extent (other scale values).

### 2.2.3 Control variables

In order to statistically control for the effects of variables other than goal orientations on the dependent variables, assessments were made of significant potential predictors which had been clearly indicated in the literature (e.g. Tönjes et al., 2008).

First, university exam grades were reported by the participants at T1. Once again, the variable was recoded and a high value corresponds to high achievement.

Second, in order to assess *ability self-concept*, at T1 a subscale ("absolute self-concept") was adapted from the School-Related Self Concept Scales ("Skalen zur Erfassung des schulischen Selbstkonzepts", *SESSKO*; Schöne, Dickhäuser, Spinath, & Stiensmeier-Pelster, 2002) to pertain to the abilities required for the teaching profession. An example of the items, which were presented along a 5-step, bi-polar answer scale, reads: "When I contemplate the skills a person needs to master the art of teaching, I consider myself to be ..." (Answer poles 1 = "... not talented" up to 5 = "... very talented"). α = .79.

Third, relevant *personality factors* were assessed at T1 by means of the abbreviated version of the Big Five Inventory (*BFI-K*; Rammstedt & John, 2005). Using

a total of 21 items, this economical instrument operationalizes five personality factors (neuroticism, extraversion, conscientiousness, agreeableness, and openness). Responses to the items are made along a five-point answer scale with the poles 1 (*very incorrect*) and 5 (*very correct*). The internal consistencies were in a satisfactory range ($\alpha$ = .65–.82; *Md* = .73). An exception was the scale "agreeableness" ($\alpha$ = .41), which was not used in the analyses.

## 2.3 Analyses

A longitudinal analytical strategy was used which utilized methods of hierarchical linear modeling (Singer & Willett, 2003). In order to model inter-individual differences, not only in the magnitudes of but also for the changes in goal orientations of teacher trainees, hierarchical linear modeling proved to be ideally suited in that it allows for individual estimates of these two parameters for each individual. In order to accomplish this, we used a two-level model in which measuring points are clustered within persons, and estimated two models for each of the four components of goal orientation as an outcome variable.

The *unconditional means model* (*Model 1*) was estimated in order to describe the proportion of between-person variation (i.e. time-constant variations between teacher trainees) and within-person variation (i.e. change with time within teacher trainees). This is defined as follows for outcome variable $Y_{ij}$, observed for person $i$ at occasion $j$:

Level 1 (occasions): $Y_{ij} = \pi_{0i} + e_{ij}$

Level 2 (persons): $\pi_{0i} = \beta_{00} + r_{0i}$

In this model, the outcome $Y_{ij}$ is expressed within persons (level 1) as the sum of a person-specific mean $\pi_{0i}$ over all occasions and an occasion-specific residuum $e_{ij}$. On the second level, between persons, the person-specific mean $\pi_{0i}$ is expressed as the sum of the mean $\beta_{00}$ of these person-specific parameters (grand mean across all occasions and persons) and a person-specific residuum $r_{0i}$. $E = Var(e_{ij})$ estimates the within-person variance of the outcome, and $R_0 = Var(r_{0i})$ estimates the between-person variance of the outcome.

In order to analyze inter-individual differences in the changes in goal orientations over time, Model 1 was extended to the *unconditional growth model* (*Model 2*), in which the outcome is expressed as a linear function of time on the within-person level. Here, each person's development is defined by an individual growth trajectory that depends on a unique set of parameters. The model is defined as follows:

Level 1 (occasions): $Y_{ij} = \pi_{0i} + \pi_{1i} \cdot TIME_{ij} + e_{ij}$

Level 2 (persons): $\pi_{0i} = \beta_{00} + r_{0i}$

$\pi_{1i} = \beta_{10} + r_{1i}$

In this equation, $Y_{ij}$ is a function of a person-specific growth trajectory, which is defined by two person-specific parameters, an intercept ($\pi_{0i}$) and a slope or growth rate over time ($\pi_{1i}$). $TIME_{ij}$ is the time variable that indicates the measuring point. In order to represent the intercept $\pi_{0i}$ as the initial status at the beginning of the pre-service teacher training, we rescaled the time metric by subtracting one from the measuring point ($j$ = 0 for T1, $j$ = 1 for T2, and so on). The individual slope $\pi_{1i}$ represents the linear rate of change in goal orientation between two measuring points (i.e. in the period of half of a year). Analogous to Model 1, the parameters of the level-1 model become the outcome variables in the level-2 model, the between-person model. In the case of the unconditional growth model, the person-specific initial status $\pi_{0i}$ is expressed as the sum of average initial status $\beta_{00}$ over all persons and a person-specific residuum $r_{0i}$, and the person-specific growth rate over time ($\pi_{1i}$) is expressed as the sum of the average growth rate $\beta_{10}$ over all persons and another person-specific residuum $r_{1i}$. Consequently, $R_0 = Var(r_{0i})$ represents the between-person variance in initial status and $R_1 = Var(r_{1i})$ represents the between-person variance in change over time. Finally, $E = Var(e_{ij})$ estimates the residual within-person variance, i.e. the variance which is not systematically related to linear change.

The models were estimated using HLM 6.06 (Raudenbush, Bryk, & Congdon, 2004) using restricted maximum likelihood estimation. To facilitate interpretation, goal orientations were $z$-standardized prior to analyses. Consequently, parameters can be interpreted similarly to standardized regression coefficients.

In order to identify typical growth trajectory patterns, we performed – subsequent to the estimation of the unconditional growth model – a hierarchical cluster analysis (using Ward's method) with the person-specific growth trajectory parameters $\pi_{0i}$ and $\pi_{1i}$ for all goal orientations.

# 3. Results

## 3.1 Descriptive statistics and bivariate correlations

Table 1 contains descriptive statistics and bivariate correlations for all variables. For reasons of clarity, the values obtained for the goal orientations were averaged over the four measuring points; the individual values can be taken from Figure 1. On the descriptive level, the mean values are highest for the learning goal orientation, followed by performance approach and performance avoidance goal orientations. The lowest means were found for the work avoidance goal orientation.

The bivariate correlations of the goal orientations of teacher trainees with external criteria, in particular with professional stress experience and adaptive attitudes concerning help, are largely consistent with the patterns of findings previously reported in the literature (see Butler, 2007; Dickhäuser et al., 2007; Tönjes et al., 2008; Tönjes & Dickhäuser, 2009).

**Table 1:** Descriptive statistics and bivariate correlations

| | *M* | *SD* | Bivariate correlations[b] | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) |
| Goal orientations[a] | | | | | | | | | | | | | | | |
| (1) Learning goal | 4.03 | 0.41 | | | | | | | | | | | | | |
| (2) Performance approach goal | 3.12 | 0.59 | .12 | | | | | | | | | | | | |
| (3) Performance avoidance goal | 2.72 | 0.55 | .05 | .71 | | | | | | | | | | | |
| (4) Work avoidance goal | 1.94 | 0.56 | -.23 | .29 | .36 | | | | | | | | | | |
| Dependent variables | | | | | | | | | | | | | | | |
| (5) Achievement (reversed grade) | 5.16 | 0.54 | .03 | -.04 | -.05 | -.17 | | | | | | | | | |
| (6) Stress experience | 1.69 | 0.42 | -.22 | -.01 | .17 | .44 | -.30 | | | | | | | | |
| (7) Attitudes concerning help | 4.14 | 0.56 | .34 | -.13 | -.25 | -.29 | .20 | -.35 | | | | | | | |
| (8) Dropout tendency | 32% | — | -.19 | -.08 | .05 | .20 | -.44 | .52 | -.31 | | | | | | |
| Control variables | | | | | | | | | | | | | | | |
| (9) University studies exam grade (reversed) | 4.85 | 0.81 | -.06 | -.06 | -.05 | -.22 | .33 | -.01 | .14 | .11 | | | | | |
| (10) Ability self-concept | 3.63 | 0.62 | .13 | .31 | -.02 | -.12 | .03 | -.29 | .15 | -.08 | .15 | | | | |
| (11) Neuroticism | 2.76 | 0.81 | .13 | .07 | .25 | .10 | -.05 | .25 | -.04 | .09 | -.03 | -.27 | | | |
| (12) Extraversion | 3.55 | 0.87 | .06 | .02 | -.20 | -.06 | .15 | -.26 | .06 | -.13 | .15 | .31 | -.28 | | |
| (13) Conscientiousness | 3.83 | 0.64 | .09 | .05 | -.11 | -.32 | .05 | -.26 | .06 | -.11 | -.04 | .28 | -.20 | .25 | |
| (14) Openness | 3.90 | 0.70 | .24 | -.09 | -.13 | -.18 | .00 | -.08 | .11 | .04 | .00 | .35 | .00 | .37 | .24 |

*Note*. $N$ = 130 teacher trainees.
[a] Values were averaged over the four measuring points (for separate values see Figure 1).
[b] $|r| \geq .17$: $p < .05$. $|r| \geq .22$: $p < .01$. $|r| \geq .28$: $p < .001$.

## 3.2 Average changes in goal orientations

In order to obtain preliminary evidence pertaining to average changes in goal orientations over the two year course of the second phase of teacher training, prior to the main analyses we performed a 4 (goal orientation component) x 4 (measuring point) factorial analysis of variance with measurement repetition on both factors. This yielded a significant main effect of measuring point ($F(3, 390) = 11.52$; $p < .001$; $\eta^2 = .081$), which indicated a decline, on average, in the goal orientations over the course of pre-service teacher training (Figure 1). In addition, a significant interaction between the two factors surfaced ($F(9, 1170) = 3.67$; $p < .001$; $\eta^2 = .027$), which indicated that the goal orientations changed differentially over the four measuring points. Post-hoc analyses conducted with the individual goal orientation components revealed that they all decreased significantly over time ($F(3, 390) = 7.995$; $p < .001$; $\eta^2 = .058$), except for the work avoidance goal orientation ($F(3, 390) = 0.131$; $p > .10$; $\eta^2 = .001$).

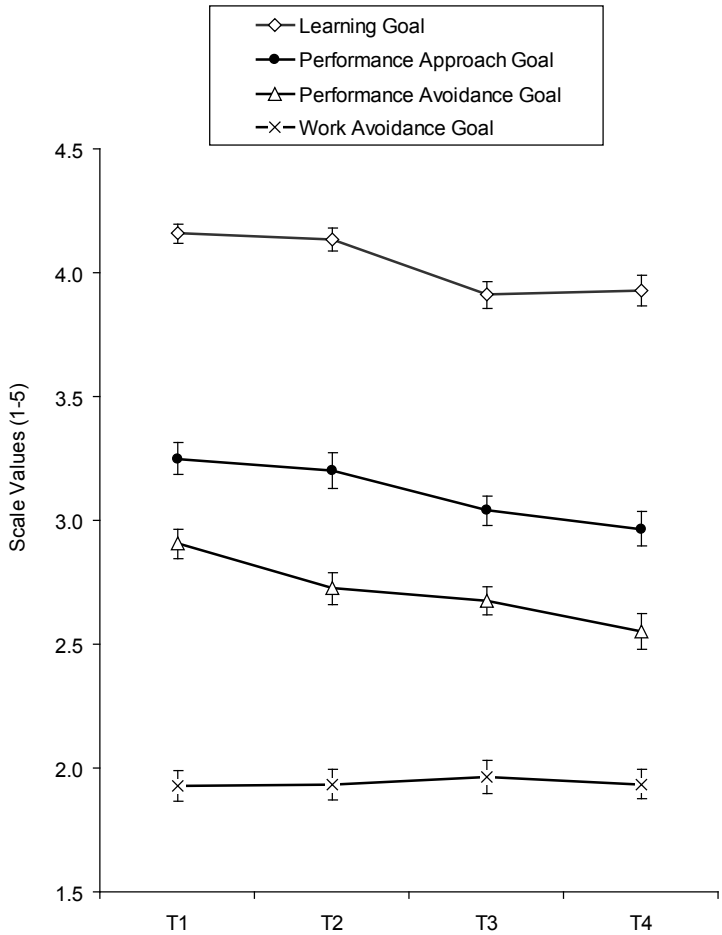
## 3.3 Inter-individual differences and intra-individual change of goal orientations

In order to substantiate evidence of between-person variations (as a measure of inter-individual differences independent of time), and within-person variations over time (as a measure of intra-individual fluctuation) of teacher trainees' goal orientations, we estimated Model 1, the unconditional means model. The resulting between-person variances ($R_0$) differed from nil for all four goal orientations (Table 2), indicating substantial inter-individual differences in the magnitudes of all goal orientations. The intra-class correlations *ICC* indicated that between 28% and 48% of the total goal orientation variances refer to inter-individual differences independent of time. Nevertheless, and important in the present context, substantial proportions of the variances were also observed, which indicate within-person fluctuations in achievement goals over time (1 - *ICC*; between 52% and 72%). Descriptively, these intra-individual fluctuations were larger than the inter-individual differences.

To complement the evidence regarding temporal stability and variability of goal orientation, auto-correlations between successive measuring points were calculated. These were small to moderate, dependant on the specific goal orientation (learning: $r = .26 - .42$; performance approach: $r = .41 - .66$; performance avoidance: $r = .46 - .51$; work avoidance: $r = .48 - .57$). On a descriptive level, the differences in these auto-correlations between the different goal orientations were in accordance with the differences in the proportions of the between-person and within-person variances described above.

The results of estimating the unconditional growth model (Model 2; see Table 2) initially confirmed the average decreases in learning, performance approach and performance avoidance goal orientations, which had also been a result of the

**Figure 1:** Means (and their standard errors) for the four components of teacher trainees' goal orientations over the course of two years of pre-service teacher training (measuring points T1 to T4)




analysis of variance with repeated measurements (significant $\beta_{10}$).[4] However, the estimates of the random effects of the unconditional growth model are much more meaningful than the variance-analytical results, which are limited to average effects. They refer to inter-individual differences with respect to the systematic (i.e. linear) change in goal orientations over the two-year pre-service teacher training period.

As can be derived from Table 2, teacher trainees differed significantly from one another in their individual growth rates for performance approach, performance

4 As a consequence of this mean drop and the *z*-standardization over all occasions and persons, the average initial status ($\beta_{00}$) for these three goal orientations is significantly larger than nil.

avoidance and work avoidance goals (significant $R_1$). Taken into consideration with the significant inter-individual differences recorded at the beginning of the pre-service teacher training ($R_0$), growth trajectories, which differ with respect to both of their parameters, could be noted for these three goal orientations. These significantly different growth trajectories indicate inter-individual differences in the initial status and in the development over the course of the second phase of teacher education, for performance approach, performance avoidance and work avoidance goals. With regard to learning goal orientation, differences in growth rates were not observed.

## 3.4 Typical growth trajectory patterns of goal orientations

Based on the significant differences between teacher trainees with regard to initial status and growth rate in goal orientations, the next step addressed the question of whether typical growth trajectories could be identified, i.e. clusters of teacher trainees, who on the basis of similar initial status proved to demonstrate similar growth trajectory patterns. An exploratory hierarchical cluster analysis (using Ward's method and Euclidean distances) with two person-specific growth trajectory parameters for each of the four goal orientations (i.e. 4 individual initial states and 4 individual growth rates) suggested a solution with three clusters (referring to the dendogram as well as the screeplot criteria). These clusters are depicted in Figure 2. These patterns will be described in detail in the following.

Cluster 1, which we refer to as "predominant performance goal orientation with increasing work avoidance", groups together 49 teacher trainees. It is characterized by initially moderate magnitudes on the four goal orientations, whereby over the course of the pre-service teacher training, the learning goal orientation decreases and work avoidance increases relatively sharply. The declines in the two performance goal orientations for this group of individuals are rather small in comparison with those found for the members of the other clusters, descriptively speaking.
The 64 individuals in Cluster 2 (referred to as "adaptive trajectory") are characterized by a relatively strong learning goal orientation and a relatively weak work avoidance goal orientation at the start of pre-service teacher training. The learning goal orientation drops, in comparison to the other two clusters, to the smallest extent, and work avoidance remains unchanged on a rather low plateau. The performance approach and performance avoidance goal orientations decline substantially over the run of the pre-service teacher training period.

Finally, Cluster 3 (referred to as "predominant work avoidance with a general loss in the significance of goals") groups together 17 individuals who had demonstrated particularly high work avoidance goal orientations and particularly low learning goal orientations at the start of pre-service teacher training. Among these persons, the four goal orientations develop quite evenly in that they reflect a general loss in the meaning of goals.

**Table 2:** Average magnitude and linear growth as well as inter-individual differences in magnitude and linear growth of teacher trainees' goal orientations: Results of estimating the unconditional means model (Model 1) and the unconditional growth model (Model 2) for goal orientations as outcomes

| | Learning goal | | Performance approach goal | | Performance avoidance goal | | Work avoidance goal | |
|---|---|---|---|---|---|---|---|---|
| Parameter | Model 1 | Model 2 | Model 1 | Model 2 | Model 1 | Model 2 | Model 1 | Model 2 |
| | | | | Fixed effects | | | | |
| $\beta_{00}$ | -0.004 | 0.226*** | 0.001 | 0.204* | 0.003 | 0.238** | -0.006 | 0.001 |
| $\beta_{10}$ | | -0.153*** | | -0.135*** | | -0.157*** | | -0.005 |
| | | | | Random effects | | | | |
| $E = Var(e_{ij})$ | 0.726 | 0.655 | 0.538 | 0.435 | 0.583 | 0.476 | 0.506 | 0.417 |
| $R_0 = Var(r_{0i})$ | 0.277*** | 0.116 | 0.472*** | 0.648*** | 0.423*** | 0.467*** | 0.467*** | 0.661*** |
| $R_1 = Var(r_{1i})$ | | 0.019 | | 0.044*** | | 0.040** | | 0.054*** |
| $ICC = R_0/(R_0 + E)$ | .276 | .150 | .467 | .598 | .420 | .495 | .480 | .613 |

*Note.* $N$ = 130 teacher trainees. All outcome variables were $z$-standardized prior to analyses. $\beta_{00}$ = Grand mean over persons and measuring points in Model 1, average magnitude at T1 (initial status) in Model 2. $\beta_{10}$ = Average growth rate (from one measuring point to another). $E$ = Variance within persons in Model 1, residual variance within persons in Model 2. $R_0$ = Outcome variance between persons in Model 1 (as a measure of inter-individual differences in magnitude independent of time), variance between persons in the initial status of the outcome in Model 2 (as a measure of inter-individual differences at T1). $R_1$ = Variance between persons in the individual growth rates (as a measure of inter-individual differences in change). $ICC$ = Intra-class correlation, specifies the proportion of variance between persons ($R_0$) on the total outcome variance ($R_0 + E$). *** $p < .001$. ** $p < .01$. * $p < .05$.

**Figure 2:** Average fitted growth trajectories among the four goal orientation components for the three clusters of persons with similar initial status and similar growth rates

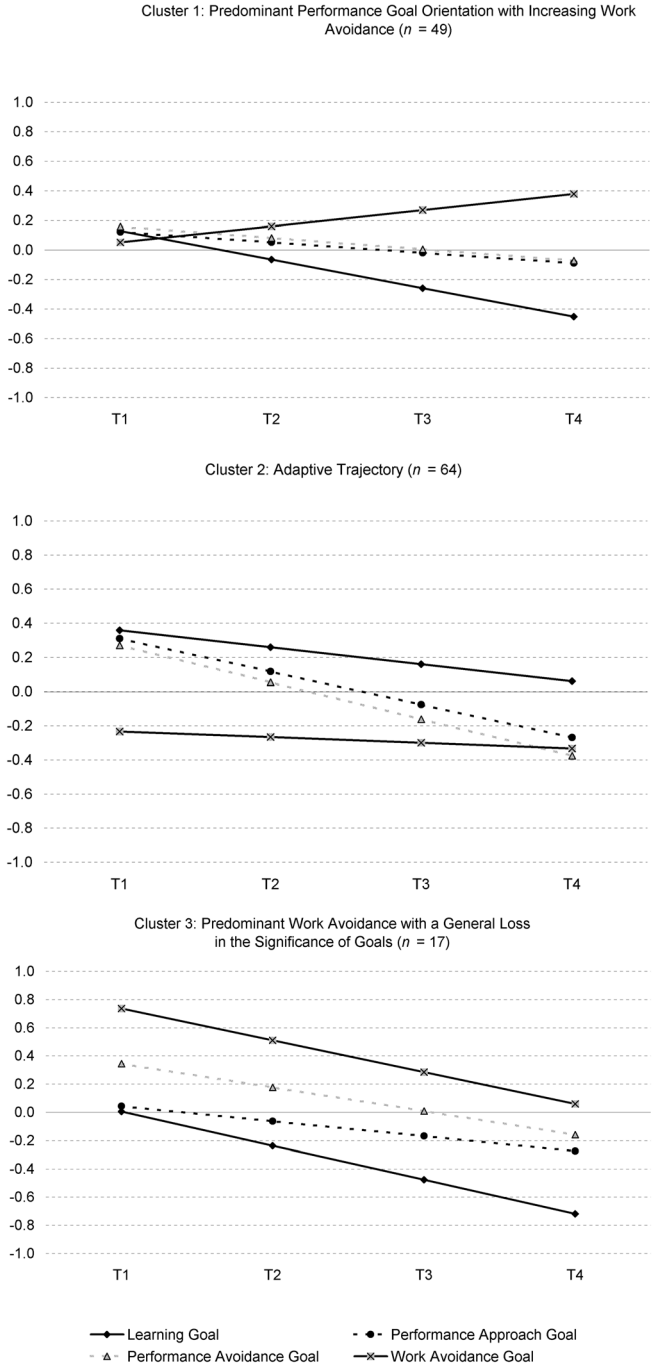


**Table 3:** Regression of achievement, stress experience and attitudes concerning help on the membership in one of three clusters of teacher trainees with similar initial status and similar growth rates in goal orientations

| | Achievement (reversed grade) ($R^2$ = .07*) | | | Stress experience ($R^2$ = .10**) | | | Attitudes concerning help ($R^2$ = .16***) | | |
|---|---|---|---|---|---|---|---|---|---|
| *Cluster membership* | *B* | *SE B* | *β* | *B* | *SE B* | *β* | *B* | *SE B* | *β* |
| Cluster 2 versus Cluster 1 and 3[a] | 0.12 | 0.07 | .16* | -0.19 | 0.05 | -.35*** | 0.16 | 0.07 | .22** |
| Cluster 1 versus Cluster 3[b] | -0.13 | 0.07 | -.16 | -0.08 | 0.06 | -.12 | -0.22 | 0.07 | -.26** |

*Note.* *N* = 130 teacher trainees. Cluster 1 (*n* = 49) is characterized by a predominant performance goal orientation with increasing work avoidance. Cluster 2 (*n* = 64) groups persons with an adaptive trajectory of goal orientations. Cluster 3 (*n* = 17) is distinguished by a predominant work avoidance goal orientation and a general loss in the significance of goals.
[a] Since it was expected that persons in Cluster 2 would show more favorable expressions of the dependent variables than the persons in the other two clusters, a one-tailed significance test was used.
[b] In that a priori no directed expectations on differences between Cluster 1 and Cluster 3 could be made, a two-tailed significance test was used.
*** $p < .001$. ** $p < .01$. * $p < .05$.

**Table 4:** Logistic regression of dropout tendency on the membership in one of three clusters of teacher trainees with similar initial status and similar growth rates in goal orientations

| *Cluster membership* | *B* | *SE B* | *Wald* | *Exp(B)* |
|---|---|---|---|---|
| Cluster 2 versus Cluster 1 and 3 | -1.10 | 0.30 | 13.62* | 0.33 |
| Cluster 1 versus Cluster 3 | -0.16 | 0.28 | 0.33 | 0.85 |

*Note.* *N* = 130 teacher trainees. Cox-Snell $R^2$ = .11. For more information see Table 3.
* $p < .05$.

## 3.5 Relevance of typical growth trajectory patterns

In order to analyze the associations of the three typical growth trajectory patterns of teacher trainees' goal orientations identified here with the dependent variables achievement, stress experiences, attitudes concerning help and dropout tendency, we performed regression analyses with contrast-coded cluster membership as predictors (dichotomized drop-out tendency: logistic regression analysis). The results are displayed in Table 3 and Table 4. We expected that the teacher trainees grouped in the cluster with a more adaptive growth trajectory pattern of goal orientations (Cluster 2) would demonstrate more beneficial dependent variables than the members of the other two clusters. Therefore, we construed a first contrast which compared Cluster 2 with Cluster 1 and Cluster 3. A second contrast (which was orthogonal to the first one) compared Cluster 1 with Cluster 3, whereby no specific expectations were declared.

With respect to achievement in pre-service teacher training, 7% of the variance could be explained through the typical growth trajectory patterns. Here it was shown that the teacher trainees with an adaptive growth trajectory pattern (Cluster 2) demonstrated significantly better achievement in pre-service teacher training than teacher trainees with other goal orientation trajectories.

A total of 10% of the variance in perceived stress experiences among teacher trainees could be explained by growth trajectory cluster membership. Here it could be shown that teacher trainees with adaptive goal orientation trajectories (Cluster 2) had lower scores in perceived stress experiences when compared to teacher trainees with alternative goal orientation trajectories.

With respect to attitudes concerning help, the analysis was able to explain the relatively largest proportion of criterion variance (16%) through typical growth trajectory patterns. Here significant effects could be recorded for both contrasts. Once again, the teacher trainees in Cluster 2 demonstrated more beneficial levels than other trainees. Moreover, teacher trainees with predominant performance goal orientations and increasing work avoidance (Cluster 1) had a less positive opinion of seeking help in comparison to the trainees with predominant work avoidance goal orientations and a general loss in the significance of goals (Cluster 3).

Finally, the logistic regression analysis with drop-out tendency as a dependant variable (see Table 4) revealed that 69% of the cases could be classified correctly when cluster membership was taken into account (Cox-Snell $R^2$ = .11). It was significantly rarer for teacher trainees with adaptive goal orientation trajectories (Cluster 2) to consider terminating their teacher education in comparison to trainees in the other clusters. In greater detail, only 16% of the teachers with adaptive goal orientation trajectories (Cluster 2) had a drop-out tendency which was present to a certain degree while, in the two remaining clusters, this was the case for about half of the trainees (Cluster 1: 45%; Cluster 3: 53%).

In order to rule out the possibility that the effects of cluster membership on the dependent variables are artifacts of systematic differences with respect to exam grades obtained in university studies, ability self-concept or personality, we repeated all regression analyses (including the logistic regression analysis), but additionally partialled out the effects of these control variables (altogether 8 predictors: 2 contrast-coded indicator variables and 6 control variables). All of the effects stated above remained significant.

## 4. Discussion

The goals individuals rely on in social learning and achievement contexts have an influence on their behavior and the actions they choose to execute (cf. Kaplan & Maehr, 2007). The achievement goal theory has been well investigated among students and shows great promise for a transfer to the population of teachers with regard to describing teacher motivation and its consequences, as indicated by pre-

vious findings. On the basis of existing research deficits, the focus of the current investigation was on the (differential) developments of goal orientations among teacher trainees in the second phase of their education, whereby data were collected at five measuring points over the two year duration of the pre-service phase.

Initially, the results obtained concerning the magnitudes of, and changes in, goal orientations showed that goal orientations, with the exception of work avoidance, generally declined over the course of the pre-service teacher training phase. One plausible explanation for this finding could be the changeover experienced by teacher trainees in moving on from university studies to encountering the responsibilities inherent in classroom instruction (cf. Oesterreich, 1987; Ulich, 1996). Here they are confronted for the first time in earnest with the demands of classroom instruction, whereby the efforts made in the name of learning or achievement may be dismantled when faced with the requirements of meeting challenges of this nature.

As expected, a substantial and significant variability could be observed among the teacher trainees for both the magnitudes of goal orientations and their associated growth trajectory patterns (with the exception of a learning goal orientation). On the one hand, this result points out the need for sophisticated methods of analysis to insure a satisfactory representation of individual development – such as the hierarchical linear approach applied here to model change (cf. Singer & Willett, 2003). On the other hand, the inter-individual differences regarding the magnitudes of, and growth trajectory patterns in, goal orientations also reference the broad diversity of developmental trajectories which can underlie teacher motivation in professional learning and achievement contexts.

In contrast to previous studies, the goal orientations of teachers were considered from a multiple goal approach and subjected to a combined investigation (e.g. Pintrich, 2000). By applying hierarchical cluster analyses, three typical growth trajectory patterns could be identified. A first group of teacher trainees demonstrated an – in comparison – adaptive trajectory of goal orientations. In contrast, the magnitudes and growth trajectory patterns found among the trainees in the other two clusters were, in at least one respect, maladaptive. These prospective teachers were characterized by either a predominant performance goal orientation with increasing work avoidance, or a predominant work avoidance goal orientation over the complete course of pre-service teacher training. All three trajectory patterns reflect declining learning goal orientations as well as declines in both performance goal orientations, albeit in varying degrees. Noteworthy is the identification of a typical goal orientation trajectory with increasing work avoidance, in that work avoidance, on average, did not change significantly across all four measuring points. This finding also speaks in favor of the need to consider changes individually, instead of (or at least in addition to) average changes.

Various aspects of the learning and achievement behavior of prospective teachers (achievement, perceived stress experiences, attitudes concerning help, dropout tendency) were differentially related to the three growth trajectory patterns. As expected, teacher trainees with adaptive goal orientation trajectory patterns, in comparison to the teacher trainees who adhered to one of the other two growth

trajectory patterns, were found to display better achievement levels at the end of pre-service teacher training, lower stress experiences, a more positive attitude regarding seeking out help as well as a lower dropout tendency. These associations remain intact even after controlling for exam grades obtained in university studies, self-concept and relevant personality factors.

These results are consistent with the findings of earlier studies, which provided evidence of how meaningful the professional goal orientations of (prospective) teachers are for their attitudes concerning help and their stress experiences (Butler, 2007; Dickhäuser et al., 2007; Tönjes et al., 2008; see also Papaioannou & Christodoulidis, 2007). Furthermore, the current findings complement the existing literature by providing evidence that changes in professional goal orientations are associated with important aspects of learning and achievement behavior.

The results presented have the practical implication that the conditions in teacher education should be commensurate with the conservation of adaptive goal orientation patterns or, as the case may be, the modification of maladaptive goal orientation patterns. A promising concept here is embodied by the TARGET model developed by Ames (1992), in which the conditions in social learning and achievement contexts are described and theoretically founded, leading to an increase in learning goal orientation. A reasonable measure appears to be the identification of teacher trainees with maladaptive goal orientation patterns through diagnostic procedures, in order to form a basis for an individual modification. Therefore, persons who are responsible for pre-service teacher training should be well informed as to inter-individual differences in magnitudes of, and changes in, goal orientations among trainees in pre-service teacher training, and they should be aware of the measures that can be applied to promote adaptive goal orientations (cf. Nitsche, Dickhäuser, Dresel, & Dickhäuser, 2008).

Of course the present investigation is subject to certain limitations. From a methodological perspective, it must be noted that the data set was subject to unit drop-out – as is often the case in longitudinal studies. Nevertheless, missing values were imputed by means of an Expectation Maximization (EM) algorithm – in contrast to the often relied on, although inadequate, practice of list-wise deleting persons who didn't participate at all measuring points (cf. Peugh & Enders, 2004). This enabled us to minimize potential systematic unit non-response bias. In terms of substance, it is clear that the focus of the current study was on the individual magnitudes of, and changes in, goal orientations and their associations with learning and achievement behavior among (prospective) teachers, but not on the conditions of professional goal orientations and their development. A detailed analysis of these conditions is a necessary and worthwhile task for future research.

## References


Ames, C. (1992). Classrooms: Goals, structures, and student motivation. *Journal of Educational Psychology, 84*, 261–271.

Anderman, E. M., Austin, C. C., & Johnson, D. M. (2002). The development of goal orientation. In A. Wigfield & J. S. Eccles (Eds.), *Development of achievement motivation* (pp. 197–220). San Diego, CA: Academic Press.

Anderman, E. M., & Midgley, C. (1997). Changes in achievement goal orientations, perceived academic competence, and grades across the transition to middle-level schools. *Contemporary Educational Psychology, 22*, 269–298.

Anderman, L. H., & Anderman, E. M. (1999). Social predictors of changes in students' achievement goal orientations. *Contemporary Educational Psychology, 24*, 21–37.

Archer, J. (1994). Achievement goals as a measure of motivation in university students. *Contemporary Educational Psychology, 19*, 430–446.

Borko, H. (2004). Professional development and teacher learning: Mapping the terrain. *Educational Researcher, 33*(3), 3–15.

Butler, R. (2007). Teachers' achievement goal orientation and association with teachers' help-seeking: Examination of a novel approach to teacher motivation. *Journal of Educational Psychology, 99*, 241–252.

Cottrell, N. (1972). Social facilitation. In C. G. McClintock (Ed.), *Experimental social psychology* (pp. 185–236). New York: Holt, Rinehart and Winston.

Dickhäuser, O., Butler, R., & Tönjes, B. (2007). Das zeigt doch nur, dass ich's nicht kann – Zielorientierung und Einstellung gegenüber Hilfe bei Lehramtsanwärtern [That just shows I can't do it: Goal orientation and attitudes concerning help among pre-service teachers]. *Zeitschrift für Entwicklungspsychologie und Pädagogische Psychologie, 39*, 120–126.

Dupeyrat, C., & Mariné, C. (2005). Implicit theories of intelligence, goal orientation, cognitive engagement, and achievement: A test of Dweck's model with returning to school adults. *Contemporary Educational Psychology, 30*, 43–59.

Elliot, A. J. (2005). A conceptual history of the achievement goal construct. In A. J. Elliot & C. S. Dweck (Eds.), *Handbook of competence and motivation* (pp. 52–72). New York: Guilford.

Elliot, A. J., & Harackiewicz, J. M. (1996). Approach and avoidance achievement goals and intrinsic motivation: A mediational analysis. *Journal of Personality and Social Psychology, 70*, 461–475.

Elliot, A. J., & Sheldon, K. M. (1997). Avoidance achievement motivation: A personal goals analysis. *Journal of Personality and Social Psychology, 73*, 171–185.

Fryer, J. W., & Elliot, A. J. (2007). Stability and change in achievement goals. *Journal of Educational Psychology, 99*, 700–714.

Harackiewicz, J. M., Barron, K. E., Tauer, J. M., Carter, S. M., & Elliot, A. J. (2000). Short-term and long-term consequences of achievement goals: Predicting interest and performance over time. *Journal of Educational Psychology, 92*, 316–330.

Kaplan, A., & Maehr, M. L. (2007). The contributions and prospects of goal orientation theory. *Educational Psychology Review, 19*, 141–184.

Linnenbrink, E. A. (2005). The dilemma of performance-approach goals: The use of multiple goal contexts to promote students' motivation and learning. *Journal of Educational Psychology, 97*, 197–213.

Malmberg, L.-E. (2006). Goal-orientation and teacher motivation among teacher applicants and student teachers. *Teaching & Teacher Education: An International Journal of Research and Studies, 22*, 58–76.

Maslach, C., & Leiter, M. P. (1999). Teacher burnout: A research agenda. In R. Vandenberghe & A. M. Huberman (Eds.), *Understanding and preventing teacher burnout. A source book of international research and practice* (pp. 295–303). Cambridge, UK: Cambridge University Press.

Meece, J. L., Blumenfeld, P. C., & Hoyle, R. H. (1988). Students' goal orientations and cognitive engagement in classroom activities. *Journal of Educational Psychology, 80*, 514–523.

Middleton, M. J., & Midgley, C. (1997). Avoiding the demonstration of lack of ability: An underexplored aspect of goal theory. *Journal of Educational Psychology, 89*, 710–718.

Midgley, C., Kaplan, A., & Middleton, M. (2001). Performance-approach goals: Good for what, for whom, under what circumstances, and at what cost? *Journal of Educational Psychology, 93*, 77–86.

Nicholls, J. G. (1984). Achievement motivation: Conceptions of ability, subjective experience, task choice, and performance. *Psychological Review, 91(3)*, 328–346.

Nicholls, J. G., Patashnick, M., & Nolen, S. B. (1985). Adolescents' theories of education. *Journal of Educational Psychology, 77*, 683–692.

Nitsche, S., Dickhäuser, O., Dresel, M., & Dickhäuser, A. (2008). Berufliche Zielorientierung bei (angehenden) Lehrern: Überlegungen zum Konzept der Lehrermotivation [Professional goal orientations of (prospective) teachers: Considerations on the concept of teacher motivation]. *Seminar – Lehrerbildung und Schule, 4*, 133–142.

Oesterreich, D. (1987). Vorschläge von Berufsanfängern für Veränderungen in der Lehrerausbildung [Young teachers' suggestions for changing teacher training]. *Zeitschrift für Pädagogik, 33*, 771–786.

Papaioannou, A., & Christodoulidis, T. (2007). A measure of teachers' achievement goals. *Educational Psychology, 27*, 349–361.

Peugh, J. L., & Enders, C. K. (2004). Missing data in educational research: A review of reporting practices and suggestions for improvement. *Review of Educational Research, 74*, 525–556.

Pintrich, P. R. (2000). Multiple goals, multiple pathways: The role of goal orientation in learning and achievement. *Journal of Educational Psychology, 92*, 544–555.

Rammstedt, B., & John, O. P. (2005). Kurzversion des Big Five Inventory (BFI-K) [Short version of the Big Five Inventory (BFI-K)]. *Diagnostica, 51*, 195–206.

Raudenbush, S. W., Bryk, A. S., & Congdon, R. (2004). HLM 6 for Windows [Computer software]. Lincolnwood, IL: Scientific Software International.

Retelsdorf, J., Butler, R., Streblow, L., & Schiefele, U. (2010). Teachers' goal orientations for teaching: Associations with instructional practices, interest in teaching, and burnout. *Learning and Instruction, 20*, 34–43.

Schafer, J. L., & Graham, J. W. (2002). Missing data: Our view of the state of the art. *Psychological Methods, 7*, 147–177.

Schedensack, P.-U. (1995). Referendariat als persönliche Krise? Zum Umgang mit psychischen Belastungen in der zweiten Ausbildungsphase [Student teaching as a personal crisis? Coping with psychological stress during the second stage of teacher education]. *Pädagogik, 47*(12), 44–48.

Schmitz, G. S. (1999). Maslach Burnout Inventory (MBI) – Deutsche Übersetzung [Maslach Burnout Inventory – German version]. In R. Schwarzer & M. Jerusalem (Eds.), *Skalen zur Erfassung von Lehrer- und Schülermerkmalen* [Scales to Assess Teacher and Student Characteristics] (pp. 64–70). Berlin: Freie Universität.

Schöne, C., Dickhäuser, O., Spinath B., & Stiensmeier-Pelster, J. (2002). *Skalen zur Erfassung des schulischen Selbstkonzepts (SESSKO)* [School-Related Self Concept Scales]. Göttingen: Hogrefe.

Schunk, D. H., Pintrich, P. R., & Meece, J. L. (2008). *Motivation in education: Theory, research, and applications* (3rd ed.). Upper Saddle River, NJ: Pearson.

Singer, J. D., & Willett, J. B. (2003). *Applied longitudinal data analysis: Modeling change and event occurrence*. New York, NY: Oxford University Press.

Skaalvik, E. M. (1997). Self-enhancing and self-defeating ego orientation: Relations with task and avoidance orientation, achievement, self-perceptions, and anxiety. *Journal of Educational Psychology, 89,* 71–81.

Tönjes B., & Dickhäuser O. (2009). Längsschnittliche Effekte von Zielorientierungen auf Faktoren des beruflichen Belastungserlebens im Lehrerberuf [Longitudinal effects of goal orientation on factors of occupational burden in the teacher profession]. *Zeitschrift für Entwicklungspsychologie und Pädagogische Psychologie, 41*, 79–86.

Tönjes B., Dickhäuser O., & Kröner, S. (2008). Berufliche Zielorientierungen und wahrgenommener Leistungsmangel bei Lehrkräften. [Goal orientation and lack of achievement in teachers]. *Zeitschrift für Pädagogische Psychologie, 22*, 151–160.

Ulich, K. (1996). Lehrer/innen-Ausbildung im Urteil der Betroffenen – Ergebnisse und Folgerungen [Teacher education judged by the persons concerned – results and consequences]. *Die Deutsche Schule, 88*, 81–97.

Wolters, C. A. (1998). Self-regulated learning and college students' regulation of motivation. *Journal of Educational Psychology, 90*, 224–235.

WAXMANN

Das Forschungsprogramm „Professionswissen von Lehrkräften, kognitiv aktivierender Mathematikunterricht und die Entwicklung mathematischer Kompetenz (COACTIV)" hat erstmalig im deutschen Sprachraum einen umfassenden empirischen Zugang zur Erfassung der professionellen Kompetenz von Lehrkräften – exemplarisch für den Bereich der Mathematik – entwickelt. Der besondere Fokus lag dabei auf dem Fachwissen und dem fachdidaktischen Wissen der Mathematiklehrkräfte. Zusätzlich werden Überzeugungen, Motivationen sowie selbstregulative Fähigkeiten als Bereiche der professionellen Kompetenz konzipiert. Hauptanliegen war es, sowohl die Struktur der professionellen Kompetenz als auch die Determinanten und Konsequenzen von Kompetenzunterschieden empirisch zu prüfen.

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