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TEACHER BELIEFS ABOUT GIFTEDNESS—

EXAMINING AND EXPLAINING TEACHER BELIEFS ABOUT GIFTED STUDENTS' CHARACTERISTICS IN AN EXPERIMENTAL DESIGN

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To my family and friends who patiently supported me during this research:
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Buddies
Mates

ABSTRACT

Previous research revealed that teachers hold beliefs about gifted students combining high intellectual ability with deficits in non-cognitive domains, outlined in the so-called disharmony hypothesis. Since teachers' beliefs about giftedness can influence which students they identify as gifted, the empirical investigation of beliefs is of great practical relevance. This dissertation comprises three research articles that investigated teacher beliefs about gifted students' characteristics in samples of pre-service teachers using an experimental vignette approach. Chapter I starts with a general introduction into beliefs, and presents the research aims of the present dissertation. The first article (Chapter II) focused on the interaction of beliefs about giftedness and gender in a sample of Australian pre-service teachers and tested if social desirability occurred when using the vignette design. Beside evidence for beliefs in line with the disharmony hypothesis, results revealed typical gender stereotypes. However, beliefs about giftedness appeared not to be gender specific and thus, to be similar for gifted girls and boys. The vignette approach was found to be an adequate design for assessing teacher beliefs. The second article (Chapter III) investigated teacher beliefs and their relationship to motivational orientations for teaching gifted students in a cross-country sample of German and Australian pre-service teachers. Motivational orientations comprise cognitive components (self-efficacy) and affective components (enthusiasm). Findings revealed beliefs in the sense of the disharmony hypothesis for pre-service teachers from both countries. Giftedness when paired with beliefs about high maladjustment was found to be negatively related to teachers' self-efficacy for teaching gifted students. The third article (Chapter IV) examined the role of teachers' belief in a just world for the formation of beliefs using a sample of Belgian pre-service teachers. It was found that the stronger pre-service teachers' belief in a just world was, the more they perceived gifted students' high intellectual ability as unfair and thus, neutralized that injustice by de-evaluating students' non-cognitive abilities. In a general discussion (Chapter V), findings of the three articles are combined and reflected. Taken together, the present dissertation showed that teacher beliefs about gifted students' characteristics are not gender specific, generalizable over countries, negatively related to teacher motivation and can be driven by fairness beliefs.

CHAPTER I

GENERAL INTRODUCTION

GENERAL INTRODUCTION

"*There is nothing either good or bad, but thinking makes it so.*"

— Hamlet, William Shakespeare

Hamlet's subjectivistic idea highlights an interesting thought: nothing is either positive or negative; people's perceptions are decisive. From a psychological perspective, one could conclude that Hamlet emphasized especially the importance of *beliefs* as being fundamental for the development of attitudes. Because of beliefs, people, groups and objects are positively or negatively perceived. The present dissertation focuses on the importance of teacher beliefs in education and engages with teachers' beliefs about gifted students' characteristics.

Beliefs help people to classify and organize the mass of information they encounter with every day (Baumeister & Bushman, 2008). For example, certain expectations and characteristics are associated with a particular social group (e.g., females and males, gifted and average-ability students). These assumptions manifest in form of generalized stereotypical beliefs. People also transfer these group-related expectations and characteristics to individuals when their group affiliation is salient, even if those characteristics may not be appropriate for the individual. Applying group assumptions toward an individual can have far-reaching consequences, especially when the assumptions are applied in an educational context. Thus, on the one hand, beliefs help people to navigate through everyday life; on the other hand, beliefs can provide misinformation. Some beliefs are accessible to us in the form of explicit beliefs and can be assessed by asking people directly. Others, called implicit beliefs, are unconscious and activated automatically, spontaneously, and without reflection. They cannot be inquired directly.

Beliefs are particularly relevant in the educational context (Kunter et al., 2013). Teacher beliefs play an important role in the successful mastering of the professional tasks (Kunter et al., 2013). In this manner, teachers' beliefs may relate to their motivation to teach certain student groups (Hachfeld, Hahn, Schroeder, Anders, & Kunter, 2015; Hellmich, Görel, & Schwab, 2016). This in turn can have an effect on their behavior toward students in the classroom, thus shaping students' learning opportunities (Pajares, 1992). For the referred group itself, stereotypical beliefs can result in negative effects. For example, teachers' beliefs about gifted students might affect which students they identify as gifted (Baudson & Preckel, 2016).

However, the reasons why people hold stereotypical beliefs can be highly diverse. One crucial idea is that beliefs are motivated (e.g., Kunda, 1990; Kunda & Sinclair, 1999). The justice motive (Ellard, Harvey, & Callan, 2016) for instance, has been found to explain stereotyping in order to restore justice cognitively if a person experience the belief in a just world to be threatened (Maes & Schmitt, 2004). If we apply this to teacher beliefs about giftedness, gifted students' advantage concerning their intellectual abilities might threaten a teacher's educational goal to be fair and to treat every student equally, thereby inducing a moment of injustice. In order to balance for gifted students' advantage in intellectual ability, teachers may cognitively restore justice by ascribing deficits in other non-cognitive domains to the gifted.

To sum up, teacher beliefs play an important role for the interaction with students in school (Voss, Kleickmann, Kunter, & Hachfeld, 2013). The evaluation of teachers' beliefs about gifted students' characteristics, their relationship to teacher motivation and the investigation of possible sources of stereotypical beliefs is highly practically relevant — this dissertation aims to shed further light into this topic.

1. BELIEFS AS A COGNITIVE COMPONENT OF ATTITUDES

When someone likes something, we would say he or she has a rather positive attitude. In social psychology, attitudes can be defined as overall evaluative judgements on people, groups or objects that can vary in their valence (positive vs. negative) and intensity (Eagly & Chaiken, 1993). Thus, attitudes can be either strong or weak and state whether we like or dislike a person, group or object.

According to the multicomponent model (Rosenberg & Hovland, 1960; Zanna & Rempel, 1988), attitudes can be based on affective, behavioral, and cognitive information. That is, each attitude is built on a pattern of likes and dislikes, behavioral interactions, and beliefs. The beliefs, thoughts, and attributes that people associate with an attitudinal object are the cognitive component of attitudes (Rosenberg & Hovland, 1960; Zanna & Rempel, 1988).

If beliefs summarize generalized assumptions about certain positive and negative attributes of a social group (i.e., about females and males, gifted and average-ability students), they are referred to as stereotypical beliefs (Baumeister & Bushman, 2008). Although stereotypical beliefs about a social group's attributes can correspond to their actual characteristics, they can also deviate more or less from the accurate perspective. That is, stereotypical beliefs are common shared perceptions about a social group in which characteristics are assumed for all group members regardless of actual characteristics of the individual. Teachers' stereotypical beliefs about gifted students' characteristics are with high practical relevance, especially if beliefs diverge from the actual perspective (see paragraph 5.1).

2. STRUCTURE OF BELIEFS: ARE BELIEFS ALWAYS EITHER POSITIVE OR NEGATIVE?

An important part in attitude research is the question of how people structure the value of their beliefs. According to the one-dimensional perspective, beliefs can be stored as opposite ends of a single dimension with either positive, negative, or neutral ratings when located somewhere in between of the ends. On the other side, the two-dimensional perspective suggests beliefs to be stored along two separate dimensions: One dimension that describes whether an attitude comprises few or many positive beliefs, the second dimension that describes whether the attitude comprises few or many negative beliefs (Maio, Haddock, & Verplanken, 2018). According to the two-dimensional perspective, people's attitudes can be based on pattern of positive and negative beliefs and hence, allows cognitive ambivalence (Cacioppo, Gardner, & Berntson, 1997).

Concerning teacher beliefs about gifted students' characteristics, beliefs may describe positive, negative or a combination of positive and negative attributes, which result in ambivalent beliefs. For example, at the same time, giftedness can be associated

with positive attributes, such as being smart, and negative attributes, such as being strenuous (see paragraph 5).

3. FUNCTIONALITY

Why do people hold stereotypical beliefs? People are likely to use stereotypical beliefs toward social groups to structure the social world. Accordingly, the purposes are very useful: stereotypical beliefs serve as heuristics in various situations and decision-making contexts and in doing-so, make judgements easier, hence, enable people to perform faster and free resources for other things (Katz, 1960; Smith, Bruner, & White, 1956). Despite the function to organize and summarize information about the social world (object-appraisal function), attitude function models (Katz, 1960; Smith et al, 1956) assume beliefs to serve to maximize reward or to minimize punishment (utilitarian function), to identify with people we like and to dissociate from those we dislike (social-adjustment function), to express people's self-concept and central values (value-expressive function) and to protect people's self-esteem (externalization/ego-defense function). The latter one emphasizes that people need to feel good about themselves (Tesser, 1988) and thus, stereotypical beliefs can be considered in terms of their relation with the need to maintain self-esteem or self-evaluation (Stangor & Schaller, 2000).

3.1 MOTIVES AND BELIEFS

People can hold stereotypical beliefs for several reasons. For example, beliefs can be directed by motives, and in doing so, assist self-serving functions (e.g. Kunda, 1990; Kunda & Sinclair, 1999). Motives are recurring patterns of (learned) aspirations and goal seeking and thus, drive people for certain targeted behavior (Schmitt & Altstötter-Gleich, 2010). Stereotypical beliefs can be the results of a person's process to follow underlying personal motives. That is, in the case of undesirable information (e.g., that members of a social group benefit from a certain privilege), motives can guide information processing through the activation of certain concerns. These concerns can deliver a motivation to act, for example, in form of coping with stereotyping to bring the information in line with the personal motive. That is, a person's desired conclusion can be determined by their underlying motive. This phenomenon to make self-serving attribution is also called

"wishful thinking" that allows people to believe what they want to believe (Kunda & Sinclair, 1999). Accordingly, motives can activate, apply or inhibit stereotypical beliefs dependent on a person's desired conclusion and in order to follow their personal motives (Kunda & Sinclair, 1999).

What motives can drive stereotypical beliefs? Beside others, research has stressed the importance of the justice motive (Ellard et al., 2016). According to Lerner's just world theory (1965), the justice motive is determined by a need to believe that the world is a just place (i.e., belief in a just world). That is, people want that people get what they deserve, and deserve what they get. Thus, people are motivated to sustain and defend their "wishful thinking" of a fair world in which everyone gets what they deserve and deserve what they get (Baumert, Rothmund, Thomas, Gollwitzer, & Schmitt, 2013; Lerner, 1980). People are motivated to maintain and protect their belief in a just world in the case of discrepant information (Hafer & Sutton, 2016). If recognized injustice seems unlikely to be resolved actively, people can restore justice cognitively by re-evaluating the situation. Several research found the belief in a just world to explain justice judgments about disadvantaged or stereotyped groups as well as cognitive reactions in form of stereotyping (Maes & Schmitt, 2004). Thus, the justice motive might also be worthy to engage for explaining teachers' stereotypical beliefs about giftedness if one assumes that gifted students' advantage in intellectual ability threatens a teachers' belief in a just world. In order to restore fairness (Gallagher, 1990), teachers might de-evaluated other non-cognitive characteristics of the gifted. However, since the suggestion that teachers' evaluation of gifted students' characteristics might be a matter of justice (e.g., Baudson, 2011; Baudson & Preckel, 2016; Gallagher, 1990), no study has tested this rational empirically.

4. EXPLICIT AND IMPLICIT MEASURES: ARE PEOPLE AWARE OF THEIR BELIEFS?

Beliefs may be consciously endorsed or rejected, but often beliefs may not be under conscious control and therefore unintentional, effortless, and automatic. Thus, on the one hand, beliefs can be the result of deliberate thinking and reflection. For example, if a person weights the pros and cons of writing a dissertation and develops a certain belief such as "Writing a thesis is exciting". This assumption can be considered as an explicit

belief of which a person is aware. However, on the other hand, beliefs can also be activated automatically and emerge without conscious reflection, that is without thinking about whether the belief is actually accurate or not. Such beliefs are often unconscious and therefore called implicit beliefs. For instance, if a person experiences a doctoral student as enthusiastic in presenting his or her research, the associations "fun", "exciting", and "self-actualization" about writing a thesis might be spontaneously activated.

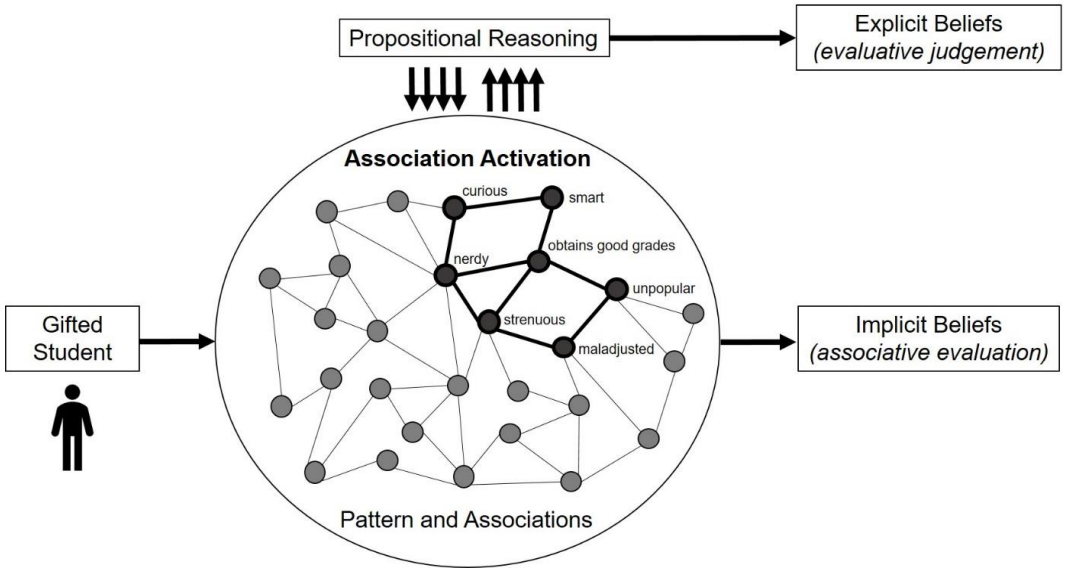

Figure 1. Activations of associations according to the Associative-Propositional Evaluation Model (APE model; Gawronski & Bodenhausen, 2006, 2011) with a gifted student as stimulus.

Explicit and implicit beliefs can differ significantly in their underlying cognitive processes. In the associative-propositional evaluation model (APE model, Gawronski & Bodenhausen, 2006, 2011), implicit beliefs are understood as the result of associative, automatic processes (associative evaluation), whereas explicit beliefs are described as evaluative judgements and as the product of propositional processes (see Figure 1). Associative processes occur when an external stimulus (e.g., a person, situation, sentence, or sound) automatically activates certain associations in the memory. That is, if a teacher receives, for example, the information that he/she will have a gifted student in his/her class, the associations "smart," "curious," "nerdy," and "strenuous" might be activated spontaneously and without deliberate reflection (see Figure 1). Importantly, according to the APE model, the same stimulus can be part of different, parallel existing associative patterns in cognitions and thus, depending on the context, cause different beliefs (e.g., Mitchell, Nosek, & Banaji, 2003). That is, teachers can have different beliefs about gifted

students depending on whether gifted students are portrayed in an academic context or for instance in a sporting context. When propositional processes occur (i.e., the formation of explicit beliefs), information that has been activated through an associative process (e.g., "This gifted student is nerdy") is checked for logical consistency. For example, if a teacher can use other information that are consistent with the automatically activated belief (e.g., "This gifted student is a loner"), the information will be accepted as valid and will be reflected in the explicit belief. However, if a person has information that is contraire (e.g., "This student is gifted and social competent") with the automatic response, the automatic response "nerdy" may be rejected and the explicit beliefs would diverge (Petty, Fazio, & Brinol, 2009). Thus, explicit and implicit beliefs can, but do not have to, influence each other; they can be similar or very different (see Figure 1).

There are different methods for assessing explicit and implicit beliefs. Implicit measures are used to assess the unconscious component of beliefs. The strength of automatic association between mental representations of concepts can be assessed, for instance with the Implicit-Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998). IAT is a computer-based measure and requires that participants rapidly react toward stimuli. That is, target concepts need to be categorized with an attribute (e.g., the concept "gifted" or "average-ability" with the attribute "maladjusted"). Faster responses to pairings hint to stronger associations between the concepts (for an introduction see: Greenwald et al., 1998). In contrast, explicit beliefs are accessible thoughts and thus, can be verbally expressed. Explicit beliefs can be directly measured through, for example questionnaires. Explicit measures include verbal statements and self-assessments (e.g., Likert scales or semantic differentials). Consequently, one of the main disadvantages of explicit measures may be the issue of socially desirable responding (King & Bruner, 2000). A useful approach to minimize social desirability in explicit measures is the vignette approach that will be explained in more detail in the following paragraph.

4.1 THE VIGNETTE APPROACH

Explicit beliefs are, in contrast to implicit beliefs, relatively easy to grasp; classical methods are questionnaires or interview. However, such self-reports can be easily falsified, especially if people want to match their statements to a social norm or their own self-image (Paulhus & John, 1998). For example, it may be a taboo for teachers to express

concerns about gifted students, which is why teachers could show a tendency to respond to questionnaires in a social desirable manner. For this reason, beliefs are often not asked directly ("What do you think about gifted students?") in self-reports. A possibility to investigate explicit beliefs is the so-called vignette approach (Schoenberg & Ravdal, 2000). Vignettes that have been used in the context of giftedness research are, for instance, brief descriptions of a fictional student in an everyday school situation (Baudson & Preckel, 2013, 2016). Teachers can be asked to evaluate a student described in a vignette. Often a cover story is used, such as that the purpose is to investigate the formation of first impressions. The descriptions do not contain any information about students' characteristics or personality. Different vignette versions are created by varying information of the variables of interests (e.g., whether the students is a girl or a boy or is gifted or an average-ability student), while all other information, including the syntax of the sentences, are identical across vignettes. The participants are then randomly assigned to one vignette version. After reading the vignette, participants are asked to assess various characteristics of the described student. This rather indirect approach to capture explicit beliefs is intended to counteract the previously described problem of social desirability bias through direct questioning and thus, it was also used to assess teacher beliefs about giftedness in the present dissertation.

5. BELIEFS ABOUT THE GIFTED: THE DISHARMONY HYPOTHESIS

What do teachers think about the gifted? The so-called disharmony hypothesis (Preckel & Vock, 2013) describes the image of the lonely "nerd". The origin of this assumption lies in the myth of the insane genius whose genius ultimately costs his mind (Becker, 1978; Lombroso, 1891). This stereotype reflects a rather ambivalent perception of giftedness. Representatives of the disharmony hypothesis assume that gifted students have superior intellectual abilities, whereas the cognitive benefits are perceived to be particularly vulnerable to social, emotional or behavioral capabilities (Gallagher, 1990, Neihart, 1999, Preckel & Vock, 2013).

A great amount of research focused on teacher beliefs about giftedness in several countries. In sum, findings within individual countries revealed that the disharmony hypothesis seems to be very prevalent (Australia: Carrington & Bailey, 2000; Lassig, 2009; Germany: Baudson & Preckel, 2013, 2016; Korea: Lee, Cramond, & Lee, 2004;

New Zeeland: Needham, 2012; US: Bain, Choate, & Bliss, 2006; Cramond & Martin, 1987; Rizza & Morrison, 2003). However, these individual studies differ in their focus (ratings of gifted students' personality vs. ratings of educational provisions for gifted students) as well as in designs and methods (e.g., interview studies vs. semantic differential). A comparison between results may not be appropriate. Hence, it was suggested to conduct cross-country comparison studies in gifted education to compare teacher beliefs over countries (Baudson & Preckel, 2016; Geake & Gross, 2008). Since now, cross-country comparison studies were rarely conducted for teacher beliefs about giftedness (for a comparison between England, Scotland and Australia see: Geake & Gross, 2008; for a comparison between the US and Germany see: Busse, Dahme, Wagner, & Wieczerkowski, 1986a, 1986b). Moreover, none of these previous cross-country studies tested for measurement invariance to ensure comparability between the countries. Thus, cross-country studies on teacher beliefs about giftedness with rigorous methodological approaches and statistical methods are needed. This dissertation aims to contribute to this claim.

An important question in the context of the disharmony hypothesis is whether the disharmony hypothesis is assumed for gifted boys and gifted girls or whether this stereotype appears to be gender specific. Findings on gender differences in teacher belief about the gifted appeared to be inconsistent. On the one hand, studies have found no gender differences in teachers' beliefs about the gifted (e.g., Baudson & Preckel, 2013), on the other hand, research revealed more positive ratings of social-emotional characteristics for gifted girls (Busse et al., 1986a, 1986b; Endepohls-Ulpe, 2004). Preckel, Baudson, Krolak-Schwerdt, and Glock (2015) found implicit associations between intellectual ability and maladjustment for boys only. Thus, further investigations on teacher beliefs about gifted girls and boys are warrant—this dissertation aims to contribute to this discussion.

5.1 BELIEFS VS. ACTUAL CHARACTERISTICS: GRAIN OF TRUTH?

In view of the widespread dissemination of the disharmony hypothesis described above, an important question arises: How accurate are beliefs in line with the disharmony hypothesis in the light of empirical findings? Numerous studies have examined whether gifted students differ from students with average ability in their qualities, abilities, and

characteristics, and whether the assumptions of the disharmony hypothesis apply to gifted individuals. It has been found that on average, gifted students show an above average academic performance (Preckel & Vock, 2013; Roznowski, Hong, & Reith, 2000) and remain academically successful throughout their life (Robinson & Clinkenbeard, 1998; Terman, 1925). Previous research also reveals that gifted individuals show higher performance. For example, gifted individuals typically possess a more efficient and larger memory, they process information faster, they show a greater achievement motivation and willingness to learn and less test anxiety (Preckel & Vock, 2013). However, the gifted do not systematically differ in other non-cognitive characteristics. For example, gifted and average-ability students do not differ with regard to their vulnerability to mental disorders, or their life satisfaction (Martin, Burns, & Schonlau, 2010; Neihart, Pfeiffer, & Cross, 2015; Reis & Renzulli, 2004; Zeidner & Shani-Zinovich, 2011). This indicates that the assumptions of greater social and emotional difficulties or more adjustment difficulties in the sense of the disharmony hypothesis are not confirmed by empirical research. Overall, these studies have shown that the "gifted" group is as heterogeneous in its non-cognitive characteristics as the "average-ability" group. Thus, the "typical" gifted student does not exist.

6. BELIEFS AS COMPONENT OF TEACHERS' PROFESSIONAL COMPETENCIES

What teacher think about certain student groups has been considered as important for managing the complex demands of the teaching profession. Thus, current models on the teaching profession (e.g., COACTIV [Cognitive Activation in the Classroom]; Kunter et al., 2013) conceptualized teachers' beliefs as a core component of teachers' professional competencies. Beside teacher beliefs and values, the COACTIV model (Kunter et al., 2013) describes teachers' profession knowledge, self-regulatory skills and motivational orientations as further core components (see Figure 2). Each of those four components consist of several domains and facets. While professional knowledge comprises specialized knowledge, didactics, and knowledge about teaching-learning processes, the component of values and beliefs covers not only the domain of teachers' beliefs about their subject, their teaching, or their own attitude and role as a teacher, but also subjective theories about students or specific student groups, such as the gifted. In addition to beliefs about the concept of giftedness in general, beliefs about gifted students include

stereotypical beliefs about what characteristics gifted students have (e.g., about their personality or their breadth of their talents), whether they need special support, or if their abilities are innate or learned.

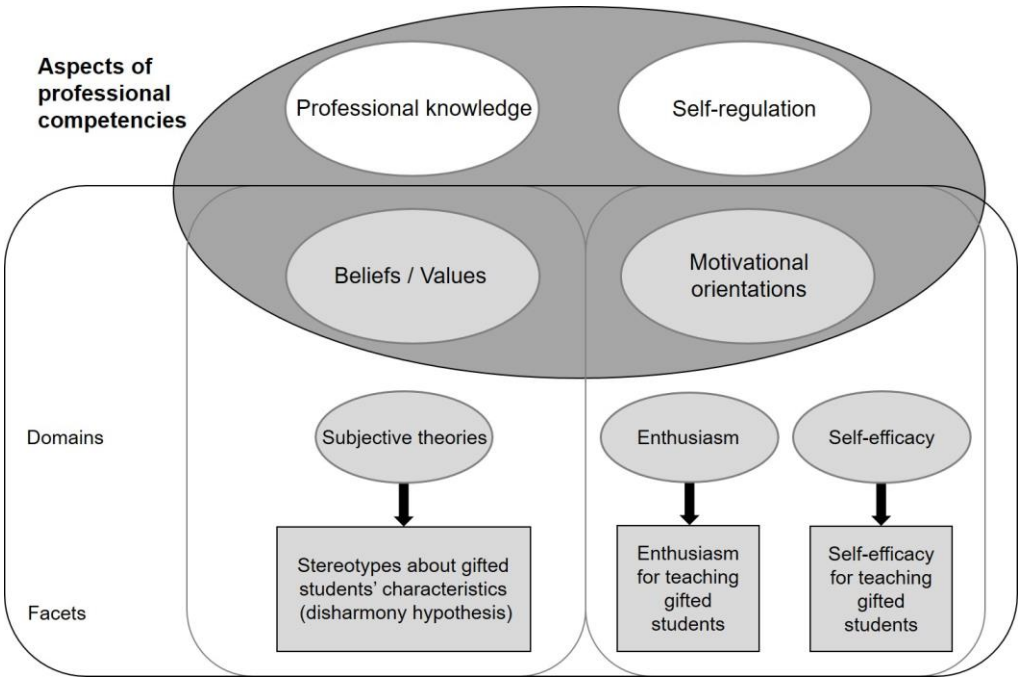

Figure 2. The COACTIV model of teachers' professional competence (Kunter et al., 2013) specified for teaching gifted students, with the four components of professional competence as well as domains and facets of competencies. Parts highlighted in grey are investigated in this dissertation.

Such models on teachers' competencies also emphasized the interplay of those components as crucial determinant for mastering the teaching demands. In this manner, previous research found teacher beliefs to be highly relevant for teachers' motivational orientations. For instance, research on teachers' beliefs about inclusive education were found to relate to teachers' motivation to engage in inclusive educational provisions (Hellmich et al., 2016). Moreover, teachers' multicultural beliefs about teaching students with immigrant background were found to relate to teachers' enthusiasm for teaching those students (Hachfeld et al., 2015). Thus, one can assume that teachers' stereotypical beliefs about gifted students' characteristics would be highly important for teachers' enthusiasm or self-efficacy to teach gifted students. However, until now, no study examined the relationship of teacher beliefs and their motivational orientations for teaching gifted students.

6.1 CONSEQUENCES: WHY DO TEACHER BELIEFS MATTER?

As outlined before, stereotypical beliefs are functional for individuals and can help people to navigate through the world and allow them to function self-serving processes. However, it may be problematic, when stereotypical group assumptions are generalized to individuals, especially in an educational context. A comparison of the empirical evidence with teacher beliefs about the gifted shows that the findings do not conform. Thus, there is a discrepancy between beliefs about the gifted and their actual qualities, abilities and characteristics. A crucial problem consists in the lack of expertise on giftedness that, among other things, results from the fact that giftedness is often not part of teacher education or teacher training. During teacher education in university, the topic of giftedness is still not often covered at all (Guskin, Peng, & Simon, 1992; Heller, Reimann, & Senfter, 2005). Teachers acquire their knowledge about the nature of giftedness and definitions of the concept often casually. Moreover, teachers learn little about the characteristics and needs of the gifted, which leaves space for stereotypical beliefs that are not in line with actual characteristics of the gifted. Consequently, teacher beliefs are often based on personal knowledge, which they gain from media representations, personal experiences, or general opinions and thus, may range from "high flyer" to the "awkward nerd" to the "misunderstood rebel" (Baudson, 2016; Preckel & Vock, 2013). In order to ensure that teacher beliefs correspondent with findings on actual student characteristics, it is important to know how those beliefs are shaped and how beliefs can be addressed in teacher education. Because teacher beliefs about non-cognitive characteristics are not in favor of gifted students, they may have a negative impact on teachers' behavior, and thus, may have negative consequences for gifted students. For example, gifted students can develop dysfunctional coping strategies that can range up to the denial of one's own abilities and consciously showing inferior performance, with the aim not to be associated with a negative or ambiguous giftedness stereotype (so-called "stigma-of-giftedness paradigm"; Coleman & Cross, 1988; Cross, 2005). If so, it should be a concern to make teacher beliefs more accurate. Even positive stereotypical beliefs do not necessarily have positive outcomes. For instance, the commonly endorsed belief that gifted students can cope with the demands in school outstandingly well can have negative consequences: Teachers' high expectations can negatively influence students' self-esteem if they do not meet these expectations.

To sum up, teacher beliefs about gifted students' characteristics that are not in line with actual attributes, do have far-reaching consequences for the future development and motivation of these students. Thus, research on the content and structure of teacher beliefs, their source of bias and consequences for teachers' motivational orientations to teach these students are worth to engage. Research on teacher beliefs can serve educational provisions for teacher education to account for the complex demand of the teaching profession.

7. THE PRESENT DISSERTATION

The pattern of how teacher beliefs are shaped has implications for teachers' behavior (Pajares, 1992) and thus plays an important role for teacher education. Teachers are exposed to numerous sources of inconsistent information about giftedness, in everyday life, in their university education and personal experiences. A great amount of research shows teachers' beliefs about the gifted consistent with the disharmony hypothesis (e.g., Baudson & Preckel, 2013, 2016; Carrington & Bailey, 2000; Lassig, 2009). However, do teachers ascribe the same ambivalent characteristics to gifted girls and boys? Are teachers' ambivalent beliefs about gifted students generalizable across countries? What are the resulting consequences for teachers' perceived enjoyment and capability to teach gifted students? And what motivates teachers to hold such stereotypical beliefs? The present dissertation addresses these questions and aims to make a methodologically sound, empirical contribution to the field of teacher education for gifted education. To examine teacher beliefs about gifted students' characteristics, the following research questions were explicated:

(1) Do teacher beliefs about gifted students differ with regard to students' gender?
(2) Do teacher beliefs about gifted students differ across countries?
(3) How do teachers' beliefs about gifted students relate to teachers' motivational orientations?
(4) Does their belief in a just world motivate teacher beliefs about gifted students?

Of note, the present dissertation investigate these research questions in a sample of pre-service teachers and not in-service teachers. However, prior studies found that beliefs about gifted students do not vary between in-service and pre-service teachers (Baudson & Preckel, 2013; Lee et al., 2004; McCoach & Siegle, 2007).

To answer these research questions, three studies were conducted that assessed data from pre-service teachers in teacher education courses. Because of the concern about social desirability when using explicit measures, an experimental vignette design was implemented. In this vignette design, participants were not directly asked to indicate their beliefs about gifted students but rather asked to rate a student described in a short vignette. The vignette design allowed for systematic variation of the relevant independent variables (students' ability level and gender) and ensured that all participants did their ratings based on the same information. The vignettes were brief descriptions of fictitious students framed in an everyday school situation. The vignettes did not contain any relevant information about the student described and differed only in the variation of the independent variables. Based on the vignette, participants rated students' characteristics to investigate how the characteristics of gifted students were evaluate compared to average-ability students. Each participant received one vignette version.

The dissertation is based on three articles[1] that have been published in or submitted to peer-reviewed journals. All three articles focus on teacher beliefs about gifted students' characteristics as one component of their professional competencies. Table 1 provides an overview on the topics of the three articles (i.e., teacher beliefs, motivational orientations for teaching, and justice motive).

The first article "Do stereotypes strike twice? Giftedness and gender stereotypes in pre-service teachers' beliefs about student characteristics in Australia"[2] (Chapter II) focuses on giftedness and gender stereotypes in a sample of Australian pre-service teachers. It was investigated how pre-service teachers' beliefs about giftedness and gender are related to their perception of students' characteristics in the context of the disharmony hypothesis (i.e., intellectual ability, adjustment, and social-emotional ability). It was aimed to examine whether there is evidence for stereotypical beliefs in line with the disharmony hypothesis. Therefore, it was identified how the label "giftedness" influenced teacher ratings on student characteristics. In doing so, it was tested whether the vignette approach is suitable for assessing stereotypical beliefs and it was questioned if social desirable responding occurs in ratings. Social desirability was

[1] The papers presented here appear exactly as submitted to the respective journal. With the aim of improving readability and comprehension, the format differs from the submitted versions.
[2] Manuscript submitted for publication. Status: under review.

controlled for in responses and it was compared if social desirability affect the significance or the direction of the effects. Consequences of beliefs and implications for teacher education are discussed.

It can be assumed that teacher beliefs about giftedness in the sense of the disharmony hypothesis do have important consequences—for gifted students in terms of personality development and for teacher behavior. In the light of the highly practical relevance of teacher beliefs, the second article "Threat or challenge? Teacher beliefs about gifted students and their relationship to teacher motivation"[3] (Chapter III) focus on these beliefs and their relations to motivational orientations (i.e., self-efficacy and enthusiasm for teaching gifted students). Because such beliefs might vary according to the country of the teachers in terms of form and direction, findings on teacher beliefs needs to be substantiated by replicating results in several countries. Thus, the second article aimed to investigate the generalizability of findings in a cross-country comparison in two convenience samples of German and Australian pre-service teachers. Based on prior findings, it was expected that beliefs about gifted students would be in line with the disharmony hypothesis assuming that gifted students are intellectually capable, but deficient in non-cognitive domains. Furthermore, stereotypical beliefs were assumed to relate to teachers' motivational orientations. Recommendations for teacher education are discussed.

While there is a great amount of research on the topic of the disharmony hypothesis (e.g., Carrington & Bailey, 2000; Lassig, 2009; Preckel et al., 2015), the formation of beliefs in response to giftedness is poorly understood. What motivates those ambivalent beliefs about gifted students' characteristics? Why do teachers ascribe gifted students deficits in non-cognitive domains? The third article "Giftedness as a matter of justice? The relation between pre-service teachers' beliefs about the gifted and their belief in a just world"[4] (Chapter IV) tackles this research gap by applying Lerner's just world theory (1965, 1980). Based on Lerner's (1965, 1980) just world theory, according to which people have a need to believe that the world is a just place, it was proposed that such ambivalent beliefs may partly reflect a person's belief in a just world. That is, the aim was to explore whether the belief in a just world lead to the attribution of negative

[3] Manuscript submitted to Gifted and Talented International. Status: Advance online publication.
[4] Manuscript submitted for publication. Status: submitted.

non-cognitive characteristics of gifted students in order to neutralize their advantage in intelligence with the aim to restore fairness. To test this hypothesis, this article assessed a sample of Belgian pre-service teachers.

This dissertation closes with a general discussion (Chapter V) in which the single results of the three articles are combined and discussed regarding their common theoretical, methodological and practical implications.

Table 1. Overview of the three articles presented in this dissertation (Chapter I–IV).

	Article 1 **Do stereotypes strike twice?**	**Article 2** **Threat or challenge?**	**Article 3** **Giftedness as a matter of justice?**
Topic	Teacher beliefs about gender and giftedness	Teacher beliefs about giftedness and the relation to motivational orientations for teaching in a cross-country comparison	The relevance the belief in a just world for teacher beliefs about giftedness
Aims	(1) Examining beliefs about giftedness (2) Examining beliefs about students' gender (3) Examining the interplay of gender stereotypes and stereotypes about giftedness (4) Testing the vignette design for its adequacy to assess stereotypical beliefs by taking social desirable responding into account	(1) Examining beliefs about giftedness in two countries (2) Examining motivational orientation to teach gifted students in two countries (3) Examining the relationship between beliefs and motivational orientations for teaching gifted students (4) Test for cross-country generalizability of findings	(1) Examining teacher beliefs about giftedness (2) Examining the moderating effect of the belief in a just world for negative beliefs about gifted students' non-cognitive characteristics
Experimental variables	Vignette as a stimulus with information about students' ability level and gender	Vignette as a stimulus with information about students' ability level and gender	Vignette as a stimulus with information about students' ability level and gender
Outcome variables	– Teacher beliefs about gifted girls and boys in the light of the stereotype about the disharmony hypothesis (intellectual ability, lack of social-emotional ability, maladjustment) compared to average-ability girls and boys – Tendency for social desirable responding	– Teacher beliefs about gifted girls and boys in the light of the disharmony hypothesis (intellectual ability, lack of social-emotional ability, maladjustment) compared to average-ability girls and boys – Enthusiasm and self-efficacy to teach students	– Teacher beliefs about gifted girls and boys in the light of the disharmony hypothesis (intellectual ability, lack of social-emotional ability, maladjustment) compared to average-ability girls and boys – Belief in a just world
Sample	315 pre-service teachers from Australia	690 pre-service teachers, n = 375 from Germany, n = 315 from Australia	527 pre-service teachers from Belgium

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CHAPTER II

DO STEREOTYPES STRIKE TWICE? GIFTEDNESS AND GENDER STEREOTYPES IN PRE-SERVICE TEACHERS' BELIEFS ABOUT STUDENTS' CHARACTERISTICS IN AUSTRALIA

ARTICLE 1:

DO STEREOTYPES STRIKE TWICE?

GIFTEDNESS AND GENDER STEREOTYPES IN PRE-SERVICE TEACHERS' BELIEFS ABOUT STUDENT CHARACTERISTICS IN AUSTRALIA

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Abstract. Stereotypes influence teachers' perception of and behaviour towards students, thus shaping students' learning opportunities. The present study investigated how 315 Australian pre-service teachers' stereotypes about giftedness and gender are related to their perception of students' intellectual ability, adjustment, and social-emotional ability, using an experimental vignette approach and controlling for social desirability in pre-service teachers' responses. Repeated-measures ANOVA showed that pre-service teachers associated giftedness with higher intellectual ability, but with less adjustment compared to average-ability students. Furthermore, pre-service teachers perceived male students as less socially and emotionally competent and less adjusted than female students. Additionally, pre-service teachers seemed to perceive female average-ability students' adjustment as most favourable compared to male average-ability students and gifted students. Findings point to discrepancies between actual characteristics of gifted female and male students and stereotypes in teachers' beliefs. Consequences of stereotyping and implications for teacher education are discussed.

Keywords: Teacher beliefs; stereotypes; giftedness; gender; teacher education; Australian culture

DO STEREOTYPES STRIKE TWICE?

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1. INTRODUCTION

Stereotypes help us to navigate through the wealth of information we encounter in everyday life by making generalizations of people based on their membership in social groups. While generalizations may be useful when making quick decisions, they may be flawed when applied to individuals (e.g., Ashmore & Del Boca, 1979). As teachers have an impact on the development of students' talents and personality, their stereotypes about specific groups of students, such as gifted students or boys and girls, are highly relevant. Current multidimensional models of teachers' professional competencies (e.g., COACTIV [Cognitive Activation in the Classroom]; Kunter et al., 2013) describe stereotypes as one core aspect of teachers' beliefs and thus, as a component of their professional competencies. In this manner, teachers' beliefs do not only cover beliefs about their subject, their teaching, or their own attitudes and role as a teacher, but also subjective theories about students such as stereotypes about male and female gifted students (Kunter et al., 2013). That is, teachers' stereotypes about gifted students comprise assumptions about giftedness, the characteristics of gifted boys and girls (e.g., regarding their personality traits or talent range), whether they need special support, or if their abilities are innate or learned.

Teachers play a pivotal role in the identification and education of gifted students. Consistent with giftedness models (for an overview, see Sternberg, Jarvin, & Grigorenko, 2011), teachers' identification of gifted students relies primarily on students' high intelligence and achievement (e.g., Endepohls-Ulpe & Ruf, 2006). However, teachers seem to have stereotypes about gifted students implying lower social and emotional skills (Baudson & Preckel, 2016) that are not in line with empirical findings (Neihart, Reis, Robinson, & Moon, 2002). Thus, these stereotypes may bias the identification of gifted students and hinder teachers from meeting their needs.

Research also shows that teachers' expectations for female and male students are biased by gender stereotypes (e.g., Keller, 2001). Because gender differences in psychological variables are small (Hyde, 2005), gender stereotypes exaggerate rather than reflect reality. Research has mostly focused on teachers' expectations for female and male students' ability, performance, and motivation, whereas research on teachers' gender stereotypes of gifted students is scarce.

Previous research showed that Australians tend to hold some reservations towards giftedness and gifted education (Gross, 1999; Lassig, 2009), reflecting egalitarian values of society (Hofstede, 2001) and the presumed incongruity of equity and excellence (Subotnik, Olszewski-Kubilius, & Worrell, 2011). Also, this was evident in recent studies of pre-service teachers concerning pre- and post- participation in a semester of studies in gifted education (Plunkett & Kronborg, 2011, in press). Although, there has been an increase of teacher education opportunities in gifted education in Australian universities in the past two decades with more exposure to learning about theories of giftedness and talent development (Jolly & Jarvis, 2018). Therefore, the aim of the present study was to investigate how Australian pre-service teachers' perception of gifted students' characteristics is influenced by stereotypes about giftedness and gender.

2. THEORETICAL BACKGROUND

2.1 STEREOTYPES

A stereotype is "a structured set of inferential relations that link a social category with personal attributes" (Ashmore & Del Boca, 1979, p. 225). Stereotypes influence social information processing and individuals' judgements and decisions and they are powerful predictors of behaviour and the interpretation of the behaviour of others (Pajares, 1992; Tiedemann, 2002). Applied to the school context, stereotypes influence teachers' beliefs about and behaviour towards students, and hence affect students' learning opportunities.

2.1.1 STEREOTYPES ABOUT THE GIFTED

The "disharmony hypothesis" illustrates giftedness as a factor that increases vulnerability (e.g., Becker, 1978). That is, high intellectual ability comes at a cost for gifted individuals,

such that they are less able in social-emotional domains compared to individuals with average ability (Baudson, 2016; Gallagher, 1990; Neihart, 1999). Thus, on the one hand the disharmony hypothesis comprises a positive component of high intellectual ability, but on the other hand also a negative component of lack in non-cognitive abilities. Disadvantageous characteristics attributed to gifted students can be mapped on two dimensions. The first dimension reflects social and emotional (dis)ability such as having bad or no peer relationships and being self-contained and introverted (e.g., Busse, Dahme, Wagner, & Wieczerkowski, 1986a, 1986b). The second dimension includes maladjusted and disruptive behaviours such as absentmindedness and arrogance (e.g., Subotnik et al., 2011). Baudson and Preckel (2013, 2016) found this stereotype to be prevalent among German pre-service and in-service teachers, irrespective of their overall professional experience.

Importantly, empirical studies comparing high-ability students with average-ability students found no differences in social and emotional ability, mental health, and antisocial behaviour (e.g., Martin, Burns, & Schonlau, 2010; Neihart, Pfeiffer, & Cross, 2015; Neihart et al., 2002; Reis & Renzulli, 2004).

2.1.2 GENDER STEREOTYPES

Gender stereotypes are beliefs about differences between females and males. Frequently held stereotypes associate the female gender category with communion (being sensitive, warm, dependent, and caring) and the male gender category with agency (being dominant, independent, task-oriented, aggressive, ambitious, and selfish; Deaux & LaFrance, 1998).

An observational study by Chick, Heilman-Houser, and Hunter (2002) showed that teachers seem to engage in gender-typed behaviours in the classroom. For example, teachers payed less attention to girls, commented on girls' appearance and ability to help others, expressed more emotions in communication with girls, and endorsed gender-typed classroom activities and playing with gender-typed toys (Chick et al., 2002).

Jones and Myhill (2004) found that teachers tend to perceive female students as more compliant and male students as more disruptive, less mature, and less diligent. According to Campbell's (1967) "grain of truth" hypothesis, gender stereotypes may reflect actual gender differences to some extent. Krahé, Berger, and Möller (2007) found that male students scored higher on self-reported untidiness, laziness, and aggressiveness,

whereas female students scored higher on diligence, sensitivity, and compassion. Female students also score higher on agreeableness and conscientiousness (De Bolle et al., 2015) and report higher levels of school engagement (Lam et al., 2012). However, effect sizes for gender differences were usually small.

2.1.3 DOUBLE STRIKE? TEACHERS' GENDER STEREOTYPES OF GIFTED STUDENTS

Previous research on the effects of gifted students' gender on teacher ratings of students' non-cognitive characteristics yielded mixed findings. Some studies did not find gender differences in teachers' beliefs about gifted students' personality (Baudson & Preckel, 2013), prosociality, adjustment (Baudson & Preckel, 2016), work ethics, or social skills (Freund-Braier, 2009). Other studies found that teachers perceived gifted male students as more self-centred (Busse et al., 1986a, 1986b) and associated adjustment problems more strongly with gifted male students compared to gifted female students (Preckel, Baudson, Krolak-Schwerdt, & Glock, 2015). Gifted female students were attributed higher social competencies, higher social integration (Endepohls-Ulpe, 2004), higher socio-emotional skills (Gagné, 1993), higher work ethics, and higher work quality (Siegle & Reis, 1998) than gifted male students.

Studies on actual gender differences in gifted students' non-cognitive characteristics indicate that gifted male and female students differ very little from each other in most psychological variables such as general self-concept, locus of control, test anxiety, mental health, and anxiety (Zeidner & Shani-Zinovich, 2011). However, a study examining the 5% most intelligent grade 10 students showed that gifted female students reported studying more, liking to work harder in school, and getting better grades than their male counterparts (Roznowski, Hong, & Reith, 2000). Yet again, most gender differences were small or at most medium in effect size. Finally, in a 40-year follow up study with students in the top 1% of mathematical reasoning ability, women and men rated their emotional well-being and psychological flourishing, their satisfaction with career success and direction, as well as their satisfaction with romantic relationships as equally high (Lubinski, Benbow, & Kell, 2014).

To summarise, if gender differences in teachers' beliefs about gifted male and female students were found, teachers perceived gifted male students less favourably than

gifted female students. However, research findings are inconsistent and it remains unclear whether teachers' stereotypes about the gifted and about gender interact with each other.

2.2 THE AUSTRALIAN CONTEXT

Since the 1970s, it has been reported that the Australian education system has been grappling with reconciling gifted education within an egalitarian framework (Braggett, 1993, Kronborg, 2018). An Australian Senate Inquiry (Senate Employment, Workplace Relations, Small Business and Education References Committee, 2001) identified negative attitudes to high intellectual ability among school management, teachers, and the community at large. Furthermore, in a study of almost 600 pre-service teachers across campuses of a leading Australian university between 2008-2014, it was found that before engaging in a semester of gifted education studies, pre-service teacher survey participants indicated they were concerned that special programs for gifted students created elitism (Plunkett & Kronborg, in press). These observations suggest a prevailing pre-occupation to limit opportunities for individuals with high intellectual potential who could be perceived as having an unfair advantage for social and economic success in the Australian society.

The current Australian Professional Standards for Teachers (Australian Institute for Teaching and School Leadership [AITSL], 2011) recommend the implementation of strategies for differentiating teaching to meet specific learning needs of all students across the full range of abilities, including the education of gifted students. However, teachers' knowledge of gifted students varies greatly (Kronborg, 2018). Most Australian universities do not provide specialised studies in gifted education for teachers. Thus, selective classes can be taught by teachers without any exposure to studies in gifted education (Plunkett & Kronborg, 2007).

In addition, research has indicated negative attitudes towards gifted education. Pre-service teachers preferred teaching average students compared to gifted students (Carrington & Bailey, 2000), they believed most gifted children who were accelerated would have social adjustment difficulties (Plunkett & Kronborg, in press), and teachers were found to have less positive attitudes towards fostering gifted students (Geake & Gross, 2008; Lassig, 2009).

2.3 SOCIAL DESIRABILITY IN EXPLICIT MEASURES OF STEREOTYPES

Socially desirable responding is the tendency for people to present a favourable image of themselves on self-report measures. Research on stereotypes often covers socially sensitive topics, as it may be the case for stereotypes about gender and the gifted. When asking people directly about their beliefs, social desirability might therefore play an important role in their answers (e.g., Baumeister & Bushman, 2008). Social desirability might also occur when asking teachers not directly about their beliefs, but indirectly in ratings of students' characteristics (King & Bruner, 2000).

In this manner, including items to assess social desirability helps to control for socially desirable responding (Nederhof, 1985). The rationale is that individuals who score high on a social desirability scale are also likely to indicate socially acceptable answers to sensitive items—especially when their true beliefs are socially undesirable, as it might be the case when explicitly rating gifted male or female students' characteristics.

3. THE PRESENT STUDY

We aimed to examine stereotypes about giftedness and gender in the Australian context. We used a vignette design in which we varied the information about a student's ability level and gender and asked participants to rate students' characteristics on scales comprising the components of the disharmony hypothesis. To our knowledge, on the topic of teachers' beliefs about giftedness, this is the first experimental study that controlled for social desirable responding and took gender stereotyping of gifted students in the Australian context into account. We investigated the following research questions:

(1) Are pre-service teachers' ratings on students' characteristics affected by students' giftedness?

Hypothesis: Based on previous findings on beliefs about the gifted (e.g., Baudson & Preckel, 2013, 2016), we expected to find support for the disharmony hypothesis according to which students' giftedness is associated with higher intellectual ability, but also with a higher lack of social-emotional abilities or more maladjustment compared to students' with average-ability.

(2) Are pre-service teachers' ratings on students' characteristics affected by students' gender?

Hypothesis: With regard to gender stereotypes (e.g., Jones & Myhill, 2004), we expected that teachers perceive male students as less socially and emotionally able, as well as less adjusted in their behaviour compared to female students.

(3) Do stereotypes about giftedness and gender interact with each other?

Regarding the interaction between giftedness and gender stereotypes, we considered two assumptions as most plausible.

Hypothesis a: Pre-service teachers' beliefs might be most favourable towards average-ability female students compared to average-ability male students and gifted students, because average-ability female students are not affected by any associated "stigma" of being gifted (e.g., being maladjusted) and because female students are in general supposed to be more compliant than male students (Deaux & LaFrance, 1998; Jones & Myhill, 2004). Thus, compared to the other groups, teachers' should rate female average-ability students as most socially and emotionally able and adjusted.

Hypothesis b: Pre-service teachers' beliefs might be least favourable towards gifted male students as compared to gifted females and average-ability students (e.g., Busse et al., 1986a, 1986b; Preckel et al., 2015). Pre-service teachers' negative beliefs about giftedness might be negatively reinforced for male students because of the association of male students with disruptive, immature, and disinclined behaviour in the classroom (Deaux & LaFrance, 1998; Jones & Myhill, 2004). Hence, they might rate gifted male students as least socially and emotionally able and least adjusted compared to the other groups.

4. METHODS

4.1 PARTICIPANTS AND PROCEDURE

We collected a sample of 315 Australian pre-service teachers from Monash University, Clayton Campus, Victoria, Australia (71 % female; age $M = 23.52$ years, $SD = 6.21$). Most participants were enrolled in Bachelor courses ($n = 213$), whereas some participants were enrolled in non-consecutive Master of Teaching courses ($n = 92$).

In an experimental between-subjects vignette design, gender (Michael/Karen) and giftedness (gifted/average) were varied, resulting in four vignette types, i.e., experimental conditions. Participants were randomly assigned to one of four vignette types. Before administering this study, we obtained the approval of the Human Subjects and Ethics Committee. Participants were given informed consent forms before data collection. The participation was voluntary and took approximately 10 minutes.

Hard-copy questionnaires were distributed in regular university classes. Additionally, 46 participants were assessed online. Testing preliminary measurement invariance (MI) across online and hard-copy samples indicated at least partial scalar MI (see Appendix A). Therefore, latent means were comparable in both samples and combined data were used for the main analyses. The number of participants for the four vignette conditions was $n_{gifted\ male} = 81$, $n_{average\ male} = 71$, $n_{gifted\ female} = 83$, and $n_{average\ female} = 80$.

4.2 INSTRUMENTS

4.2.1 PRE-SERVICE TEACHERS' DEMOGRAPHICS

Participants were asked for their age, gender, level of experience with gifted students, and knowledge about giftedness (5-point rating-scales with 1 = *none* to 5 = *a lot*).

4.2.2 VIGNETTE

> Michael is a student at the school where you have been teaching for one year. Michael is twelve years old and gifted. Mr. Smith, the teacher who was supposed to teach the last period of the day, has called in sick. You take over this lesson and allow the children to do homework or keep themselves busy independently. Michael flicks through an atlas and then walks towards a big world map mounted on the classroom wall. Two other children are already standing in front of the map, giggling. Michael asks the two of them: "Do you know which continent has the most people?" One of the children replies: "Why would you want to know that?" The other child walks back to his seat. Michael replies: "Well, never mind. Doesn't matter." After a while, Michael walks up to you and asks: "When will Mr. Smith be back?"

Figure 1. Sample vignette with student described as male and gifted.

The vignette was taken from previous studies (Baudson & Preckel, 2013, 2016; Matheis, Kronborg, Schmitt, & Preckel, 2018) and was used as stimulus for pre-service teachers' ratings on a student's characteristics (see Figure 1). The vignette comprised a brief description of a fictitious student in an everyday school situation. This situation was open to interpretation and therefore suitable to elicit stereotypes. That is, besides his or her ability level and gender, the vignette comprised no further information about students' characteristics. Because no additional information about the student was given, perceptions of the student should reflect stereotypes about giftedness and gender.

4.2.3 QUESTIONNAIRE TO ASSESS STEREOTYPES ABOUT GIFTEDNESS AND GENDER

After reading a vignette, participants rated students' characteristics on 13 items that captured the disharmony beliefs on three dimensions (see Table 1). Items were answered on a 6-point Likert scale (1 = *false* to 6 = *true*). The questionnaire was developed and validated within several Bachelor and Master Theses (Issa, 2016; Matheis, 2015; Rumanyika, 2016) and consisted of 21 items on five dimensions in total: three dimensions capture beliefs and two dimensions capture teacher motivation. To assess disharmony beliefs, we used the three student-related dimensions only.

Table 1. The three dimensions and their items of the questionnaire to capture beliefs about students in the context of the disharmony hypothesis.

Dimension	Items
Intellectual ability	This child is smart.
	This child obtains good grades.
	This child is clever.
	This child is intelligent.
	This child is competent.
Lack of social-emotional ability	This child lacks social skills.
	This child is withdrawn.
	I rate the child's social-emotional ability rather negatively.
	I rate the child's social-emotional ability rather positively. [inverted item]
Maladjustment	Teaching this child is strenuous.
	This child is intolerant.
	This child considers himself/herself superior to everyone else.
	This child displays behavioural difficulty.

Note. ω = McDonald's Omega. Intellectual ability: $.81 \leq \omega \leq .89$; lack of social-emotional ability: $.78 \leq \omega \leq .82$; maladjustment: $.66 \leq \omega \leq .73$.

4.2.4 SOCIAL DESIRABILITY SCALE

We used four items from the Crowne-Marlow Social Desirability Scale (Crowne & Marlowe, 1960). Items were "I sometimes try to get even rather than to forgive and forget;" "There have been some occasions when I took advantage of someone;" "I like to gossip at times;" "I am always willing to admit when I made a mistake". Items were answered on 6-point Likert scales (1 = *false* to 6 = *true*).

4.3 DATA ANALYSES

We performed a repeated measures ANOVA with giftedness (gifted/average ability) and gender (female/male) as independent variables and the ratings as one factor with three repeated measures (i.e., pre-service teachers' ratings on students' intellectual ability, lack of social-emotional ability, and maladjustment). Each participant rated those three student-related dimensions for one student described in one out of four vignette types. Therefore, ratings were not independent of each other; an issue we considered with the repeated measures ANOVA.

Following the significant main effects of repeated measures ANOVA, we conducted separate univariate analyses. Next, we identified the role of social desirability by including it as covariate. We conducted all analyses with IBM SPSS Statistics for Windows, Version 25 (2017).

4.3.1 PRELIMINARY ANALYSIS: MEASUREMENT INVARIANCE OF THE QUESTIONNAIRE

To draw valid comparisons, the questionnaire must measure the same constructs in all four vignette conditions. Therefore, we tested for measurement invariance (MI) by conducting a multi-group confirmatory factor analysis (MGCFA) with the statistical software Mplus 7.4 (Muthén & Muthén, 1998–2015). This approach compares less restricted with more restricted measurement models (configural, metric, scalar, strict MI; Steenkamp & Baumgartner, 1998). The comparison of factor means across vignette conditions requires at least scalar MI which is supported if there are only small changes in the comparative fit index (CFI) compared to the model that assumes metric MI, i.e., ΔCFI $\leq$.01 (Chen, 2007). Moreover, valid comparisons can also be made if some indicators are partially invariant (Steenkamp & Baumgartner, 1998).

After establishing (partial) scalar MI (see Results), we used latent factor scores for each of the three dimensions of the questionnaire to examine the effect of giftedness and gender on ratings. Therefore, we simultaneously derived factor scores for each of the three dimensions from MGCFA across all four experimental conditions. MGCFA does not estimate the absolute values of factor means for each group but rather the differences in factor means between one reference group (here male/gifted) and each comparison group.

5. RESULTS

5.1 MEASUREMENT INVARIANCE TESTING OVER VIGNETTE CONDITIONS

Partial scalar MI held for the questionnaire dimensions so that the comparison of latent factor means across vignette types was feasible ($\Delta CFI \leq .01$, see Appendix B). For means, standard deviations of latent factor scores, and reliabilities for the four vignettes (McDonald's Omega; Brunner, Nagy, & Wilhelm, 2012) see Table 2.

Table 2. Reliabilities (McDonald's Omega), means, and standard deviations of the dependent variables based on (partial) scalar factor scores (reference group: gifted male fixed to zero).

		INT			SOE			MAL		
Groups	*n*	ω	*M*	*SD*	ω	*M*	*SD*	ω	*M*	*SD*
Giftedness										
Gifted	164		–0.02	0.61		–0.10	0.49		–0.05	0.45
Average	151		–0.44	0.57		–0.16	0.61		–0.46	0.48
Gender										
Female	163		–0.22	0.67		–0.28	0.56		–0.39	0.51
Male	152		–0.22	0.59		0.03	0.49		–0.09	0.46
Giftedness × Gender										
Gifted male	81	.84	0.00	0.53	.78	0.00	0.48	.72	0.00	0.45
Average male	71	.84	–0.47	0.55	.78	0.07	0.52	.73	–0.20	0.45
Gifted female	83	.89	–0.03	0.68	.74	–0.20	0.48	.69	–0.11	0.45
Average female	80	.81	–0.42	0.59	.82	–0.35	0.63	.66	–0.69	0.39

Note. $N = 315$. ω = McDonald's Omega. INT = intellectual ability; SOE = lack of social-emotional ability; MAL = maladjustment.

5.2 DESCRIPTIVE STATISTICS

Pre-service teachers reported little experience with gifted students ($M = 2.53$, $SD = 0.96$) and low knowledge on the topic of giftedness ($M = 2.71$, $SD = 0.82$). Pre-service teachers' experience and knowledge showed no significant or very small correlations with student ratings (Table 3). Therefore, these variables were not included in subsequent analyses. The correlation of social desirability with the lack of social-emotional ability and maladjustment indicated that pre-service teacher ratings on those student characteristics might be confounded with socially desirable responding (see Table 3).

Table 3. Correlations between (partial) scalar factor dimensions of the questionnaire, social desirability, experience with the gifted, knowledge about giftedness, and independent variables.

	INT	SOE	MAL
INT	—		
SOE	–.19***	—	
MAL	–.12*	.48***	—
Social desirability	.01	–.17**	– .16**
Experiences with the gifted (1 = *none*, 5 = *a lot*)	.07	.06*	.01
Knowledge about giftedness (1 = *none*, 5 = *a lot*)	.08	.11*	.02
Independent variables (vignette)			
Giftedness (0 = average, 1 = gifted)	.34***	.05	.40***
Gender (0 = female, 1 = male)	.00	.28***	.29***

Note. INT = intellectual ability; SOE = lack of social-emotional ability; MAL = maladjustment. $N = 315$.
$^{*}p \leq .05$. $^{**}p \leq .01$. $^{***}p \leq .001$.

5.3 STEREOTYPING

For the repeated-measures ANOVA we used Greenhouse-Geisser estimates of sphericity ($\varepsilon = .77$) to correct degrees of freedom for sphericity violations (Mauchly's $W = .70$, $\chi^2(2) = 111.79$, $p < .001$). Repeated-measures ANOVA showed a significant main effect for the dimensions, $F(1.53, 475.62) = 5.09$, $p = .02$. Thus, we followed-up with separate univariate ANOVAs for each dimension (2 × 2 factorial ANOVAs), which included the main effects for giftedness and gender, and the interaction effect for those two independent variables. Table 4 displays statistics for the univariate ANOVAs and Figure 2 displays latent mean differences compared to the reference group (male/gifted).

5.3.1 PRE-SERVICE TEACHERS' RATINGS ON STUDENTS' INTELLECTUAL ABILITY

There was a main effect for giftedness, $F(1, 310) = 40.83$, $p < .001$, partial $\eta^2 = .12$, indicating that pre-service teachers rated gifted students as significantly intellectually more able than average-ability students. The main effect of gender, $F(1, 310) = 0.03$, $p = .86$, and the interaction effect, $F(1, 310) = 0.40$, $p = .53$, were non-significant.

5.3.2 PRE-SERVICE TEACHERS' RATINGS ON STUDENTS' LACK OF SOCIAL-EMOTIONAL ABILITY

There was no main effect for giftedness, $F(1, 310) = 0.49$, $p = .49$. We found a main effect for gender, $F(1, 310) = 27.23$, $p < .001$, partial $\eta^2 = .08$, indicating that pre-service

teachers rated male students as less social-emotionally able than female students. The interaction effect was not significant, $F(1, 310) = 3.55$, $p = .06$.

5.3.3 PRE-SERVICE TEACHERS' RATINGS ON STUDENTS' MALADJUSTMENT

We found both a main effect for giftedness, $F(1, 310) = 62.21$, $p < .001$, partial $\eta^2 = .17$, and for gender, $F(1, 310) = 35.87$, $p < .001$, partial $\eta^2 = .10$. The interaction effect was significant, $F(1, 310) = 15.01$, $p < .001$, partial $\eta^2 = .05$, indicating that pre-service teachers perceived female average-ability students as less maladjusted than male average-ability students, $F(1, 310) = 46.47$, $p < .001$, partial $\eta^2 = .13$, but gifted male and female students as equally maladjusted, $F(1, 310) = 2.35$, $p = .13$, and more maladjusted than average-ability students, $F(1, 310) = 62.21$, $p < .001$, partial $\eta^2 = .17$.

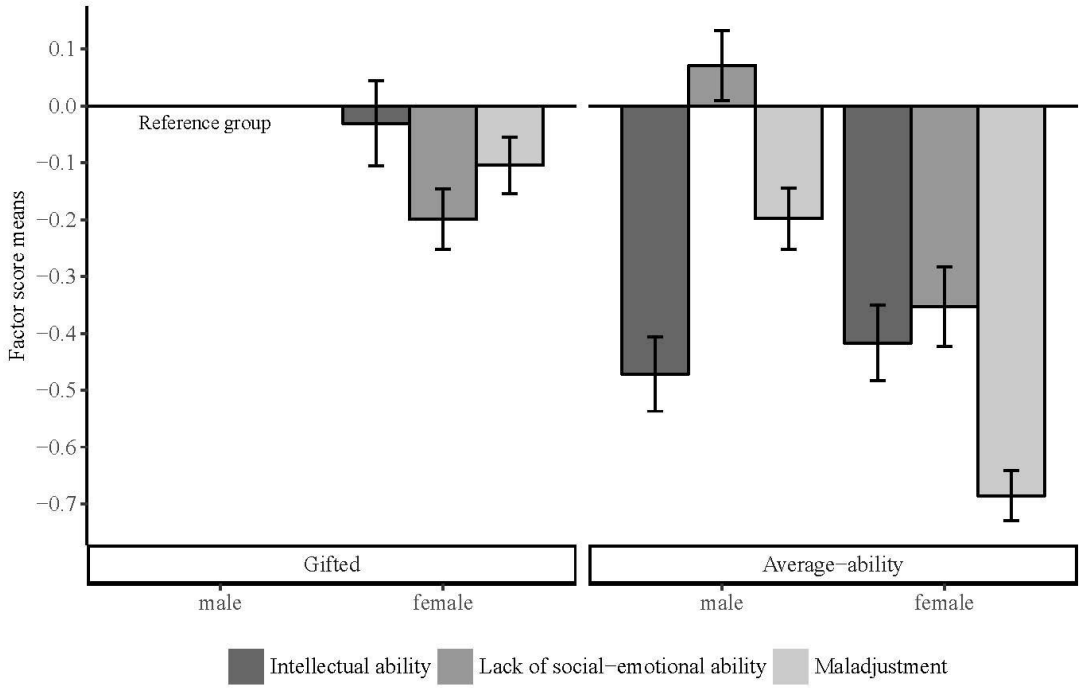

Figure 2. Factor score means of ratings on students' intellectual ability, lack of social-emotional ability, and maladjustment. The ratings on gifted male students served as the reference group.

5.4 CONTROL FOR SOCIAL DESIRABILITY

Social desirability as a covariate was significant for pre-service teachers' ratings on students' social-emotional ability, $F(1, 294) = 8.50$, $p = .004$, partial $\eta^2 = .03$, and adjustment, $F(1, 294) = 7.36$, $p = .01$, partial $\eta^2 = .02$, indicating that these ratings were affected by social desirability, but not the ratings on students' intellectual ability, $F(1, 294) = 0.24$, $p = .62$. When including the covariate, the explained variance increased slightly for all three dimensions (see Table 4).

Table 4. Giftedness × gender univariate analyses of variance for the three dependent variables including social desirability as covariate.

		ANOVA		ANCOVA controlled for social desirability	
Independ variables and covariate	Dimensions	$F(1, 310)$	partial η^2	$F(1, 294)$	partial η^2
Social desirability	INT			0.24	
	SOE			8.50**	.03
	MAL			7.36**	.02
Giftedness	INT	40.83***	.12	39.50***	.12
	SOE	0.49		0.31	
	MAL	62.21***	.17	57.73***	.16
Gender	INT	0.03		0.01	
	SOE	27.23***	.08	22.81***	.07
	MAL	35.87***	.10	31.37***	.10
Giftedness × Gender	INT	0.40		0.38	
	SOE	3.55		3.19	
	MAL	15.01***	.05	13.13***	.04

Note. Explained variance for the ANOVA: INT $R^2 = .12$, SOE $R^2 = .09$, MAL $R^2 = .27$. Explained variance for the ANCOVA: INT $R^2 = .12$, SOE $R^2 = .11$, MAL $R^2 = .29$. INT = intellectual ability; SOE = lack of social-emotional ability; MAL = maladjustment.
*$p \leq .05$. **$p \leq .01$. ***$p \leq .001$.

6. DISCUSSION

Stereotypes in teachers' beliefs are an important topic for teacher education because they might impair teachers providing for students' needs. Using a vignette approach, controlling for socially desirable responding, and applying rigorous statistical methods, this study investigated Australian pre-service teachers' stereotypes of gifted male and

female students.

Our results showed that Australian pre-service teachers endorsed the disharmony hypothesis: They perceived gifted students as more intelligent but also as more maladjusted than average-ability students. This finding is in line with previous research in other countries (e.g., Baudson & Preckel, 2013, 2016) and consistent with an egalitarian attitude that prevails in many democratic countries and particularly so in the Australian culture (e.g., Braggett, 1993; Gross, 1999; Kronborg, 2018; Plunkett & Kronborg, in press; Senate Employment, Workplace Relations, Small Business and Education References Committee, 2001).

Furthermore, we found evidence that Australian pre-service teachers endorsed gender stereotypes. Although Australian pre-service teachers rated male and female students' intellectual ability similarly, they rated male students' social-emotional abilities as lower and their maladjustment as higher compared to female students. This finding is in line with the "compliant girl" stereotype (Jones & Myhill, 2004).

Considering these findings so far, do stereotypes about giftedness and gender strike twice? We found that pre-service teachers perceived female average-ability students as less maladjusted than male average-ability students. However, gifted male and female students were perceived as equally more maladjusted compared to average-ability students. This finding is in contrast to the findings by Preckel et al. (2015) who found that pre-service teachers associated gifted male students most strongly with adjustment problems. However, Preckel et al. (2015) investigated implicit stereotypes, that is, beliefs of which people do not need to be aware, whereas we assessed explicit stereotypes, that is, beliefs that people consciously endorse. Explicit and implicit beliefs can be unrelated to each other (e.g., Gawronski & Bodenhausen, 2006). Thus, for giftedness and gender stereotypes, we conclude that stereotypes can strike twice in implicit beliefs, but for explicit beliefs, it seems that the disharmony belief overlies gender stereotypes.

With our vignette design, we implemented a standard approach that previous studies used to minimize socially desirable responding. Nevertheless, we found that social desirability affected per-service teachers' ratings on students' non-cognitive characteristics. However, controlling for social desirability did not change the direction and significance of effects, but increased the percentage of explained variance. By

accounting for pre-service teachers' social desirability, we decreased the error variance and hence increased the power of testing the effects of giftedness and gender. Future studies on stereotypes and giftedness (and other socially sensitive stereotypes) are well advised combining the vignette approach and the assessment and statistical control of individual differences in social desirability.

6.1 LIMITATIONS

Potential limitations of our study result from the unequal gender distribution in our sample. In today's Australian pre-service teachers, females are over-represented and thus in our sample as well. Due to the comparatively small number of male participants, it was not possible to include pre-service teachers' gender into our analyses. Follow-up studies should specifically recruit males to explore whether or not the teachers' own gender interacts with the gender of students when rating their ability and characteristics. Although previous research did not find such interactions (e.g., Preckel et al., 2015), they may show up in some cultures and under some conditions (e.g., in achievement domains where relevance for teachers' self-esteem might differ by gender).

We used a sample of pre-service teachers only. Thus, our results cannot be generalized to in-service teachers. However, previous research has shown that in-service and pre-service teachers hold incorrect beliefs to a similar extent (e.g., Baudson & Preckel, 2013, 2016), but these findings need replication.

6.2 IMPLICATIONS FOR PRACTICE

6.2.1 CONSEQUENCES: WHY TEACHERS' STEREOTYPES ARE CHALLENGING

Stereotypes often guide judgements and decisions because people believe in their accuracy (Smith, Mackie, & Claypool, 2014). People prefer stereotype confirming over disconfirming information and tend to interpret ambiguous information as stereotype-consistent (Smith et al., 2014). When making important judgements, such as identifying gifted students, teachers are at risk of preferring or putting more weight on information about individual students that is consistent with their stereotypes. Counteracting this bias requires knowledge about one's stereotypes, their (partial) incorrectness, as well as motivation and cognitive capacity to avoid these biases. Teachers who endorse the

disharmony hypothesis are prone to identify students as gifted who are not only exceptionally bright but also maladjusted. Thus, exceptionally bright students who are not simultaneously maladjusted might be overlooked. Such false negative judgments will inevitably limit learning for gifted students who function well and do not lack social-emotional skills. Because maladjustment is implicitly associated with giftedness and being male (Preckel et al., 2015), gifted female students are particularly likely to be overlooked as being gifted. To the extent that parents and students themselves accept the disharmony hypothesis, biased judgments and decisions due to teacher stereotypes will be amplified (Berlin, 2009).

Stereotypes that are in line with the disharmony hypothesis might also influence teachers' expectations and behaviour towards students in class, thus shaping gifted students' learning opportunities. While attributing high intellectual ability to gifted students might lead to high achievement expectations for these students, the attribution of maladjustment might fuel the expectation of related difficulties, thereby enhancing gifted students' risk for negative development (for a profound discussion, see Preckel et al., 2015). In relation to this, a "stigma of giftedness" can have negative effects for gifted students' actualization of potential but can also contribute to feelings of stigmatization and thus to a negative personality development (Cross, 2005; Rimm, 2002). To avoid the confrontation with negative stereotypes towards giftedness, gifted students can apply a variety of strategies such as hiding or denying their giftedness (Swiatek, 2001). Faced with stereotype-consistent expectations, students may also adapt to stereotypical role behaviour–to fulfil the expectations that are placed on them (self-fulfilling prophecy; Jussim & Harber, 2005). Stereotypes can thus directly affect students' behaviour. As a consequence of gender stereotypes, female and male students may endorse gender stereotypes, as they try to fit in as a "real girl" or a "real boy", thus impairing the development of their "gender atypical" skills, interests, and personality.

6.2.2 TEACHER EDUCATION: HOW TO OVERCOME TEACHERS' STEREOTYPES

What could be done to enable Australian teachers to discard stereotypes and provide for gifted students' needs? Our findings stress the importance of teachers' knowledge of (1) giftedness and (2) the consequences of stereotyping students. Mandatory modules on the education of the gifted that provide a setting in which teachers learn about conceptions of

giftedness and can reflect on their stereotypes should be integrated in their curriculum. Several studies on teachers' attitudes towards the education of the gifted showed that stereotypes can be changed through information transfer and contact (e.g., Goodnough, 2001; Jung, 2014; Lassig, 2009; Plunkett & Kronborg, 2011). Whether such modules also have an effect on stereotypes about giftedness and gender still needs to be explored: For example, by comparing teachers who participated in a module on teaching gifted girls and boys, and learning about giftedness and its implications and teachers who did not. These modules should be mandatory because of self-selection effects: Teachers who are already very knowledgeable and/or do not hold stereotypes about gifted students in the first place are likely to self-select into these courses.

To break mechanisms that hinder stereotype change, such as attribution (explaining information away), subtyping, and contrast effects (Smith et al., 2014), contact with the stereotyped group, here gifted students, has proved to be effective (Kenworthy, Turner, Hewstone, & Voci, 2005). Thus, teacher education programmes should therefore (1) provide repeated contact with gifted students that makes stereotype-inconsistent experiences plentiful because counter-stereotypic behaviour could easily be explained away as unstable over time or as a results of special circumstances when only meeting once or twice. Moreover, teachers should (2) meet many gifted students to avoid teachers forming expectations and reassigning students to subtypes, while the initial giftedness stereotype remains the same. Furthermore, it must be ensured that (3) stereotype-disconfirming information comes from typical gifted students and provides strong and consistent reminders of their group membership (Smith et al., 2014). For example, this could be reached by letting pre- und in-service teachers teach, or at least observe in classes, for the gifted repeatedly.

6.3 CONCLUSION

Stereotypes are one core aspect of teachers' beliefs and thus, a component of their professional competencies (e.g., Kunter et al., 2013). Our study contributes to a deeper understanding of (pre-service) teachers' stereotypes about giftedness and gender. We found that pre-service teachers in Australia endorsed the disharmony hypothesis, suggesting that gifted individuals are equipped with high intellectual ability, but show adjustment difficulties compared to individuals with average ability, and "typical" gender

stereotypes. Those stereotypes are not in line with actual student characteristics, which implies a substantial risk for discrimination when relying on these stereotypes.

Stereotypes are linked to expectations about behaviour. As we know that expectations about behaviour have self-fulfilling power, students might eventually adapt to stereotypes they encounter, which would be highly undesirable. Therefore, teachers need to be informed about the incorrectness of their stereotypes. Furthermore, targeted supervision might be advised in order to assure that discrimination based on flawed stereotypes does not happen.

To change stereotypes, teachers need to understand the nature of giftedness, reflect on their beliefs to be aware of their own stereotypes, and know the possible effects of stereotypes on their behaviour in class as well as on students' development. Then, they have the opportunity to restructure their assumptions. Possible ways for successfully reducing stereotypes are to provide contact with gifted students and to offer a setting that allows reflection on one's own stereotypes about giftedness and gender. Furthermore, we recommend that (pre-service) teacher education programmes integrate mandatory modules on the education of the gifted in the curriculum.

With our study, we hope to motivate further research in this vein to offer more evidence based means for changing incorrect stereotypes about gifted boys and girls.

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8. APPENDIX

Appendix A. Tests for measurement invariance for the three dimensions of the questionnaire across online (n = 46) and random hard-copy sample (n = 30) for male vignette with Satorra-Bentler correction in $\chi 2$-difference testing for MLR estimator.

Model	$\chi 2$	*df*	*p*	CFI	Comparison	ΔCFI	$\Delta\chi 2$	Δ*df*	*p*($\Delta\chi 2$)
INT									
1. Configural	11.615	10	.312	.990					
2. Metric	13.819	14	.463	1.000	2 vs. 1	.001	2.295	4	.682
3. Partial Scalar	15.802	17	.538	1.000	3 vs. 2	.000	1.558	3	.669
4. Strict	24.552	22	.319	.985	4 vs. 3	.015	8.465	5	.132
SOE									
1. Configural	3.049	4	.550	1.000					
2. Metric	4.662	7	.701	1.000	2 vs. 1	.000	1.472	3	.689
3. Scalar	7.002	10	.725	1.000	3 vs. 2	.000	2.375	3	.498
4. Strict	13.049	14	.526	1.000	4 vs. 3	.000	5.643	4	.228
MAL									
1. Configural	1.115	4	.892	1.000					
2. Metric	7.048	7	.424	.999	2 vs. 1	.001	5.535	3	.137
3. Partial Scalar	6.191	8	.626	1.000	3 vs. 2	.001	1.967	1	.161
4. Strict	23.111	12	.027	.832	4 vs. 3	.168	18.918	4	.001

Note. N = 92. *df* = degrees of freedom; CFI = comparative fit index. INT = Intellectual ability; SOE = Lack of social-emotional ability; MAL = Maladjustment.

Appendix B. Tests for measurement invariance for the three dimensions of the questionnaire with MGCFA (four vignette groups) with Satorra-Bentler correction in $\chi 2$-difference testing for MLR estimator.

Model	χ^2	*df*	*p*	CFI	Comparison	ΔCFI	$\Delta\chi^2$	Δ*df*	$p(\Delta\chi^2)$
INT									
1. Configural	26.024	20	.165	.985					
2. Metric	34.664	32	.342	.993	2 vs. 1	.008	9.240	12	.682
3. Partial Scalar	48.148	41	.380	.995	3 vs. 2	.002	8.221	9	.512
4. Strict	73.691	56	.057	.955	4 vs. 3	.040	28.340	15	.020
SOE									
1. Configural	4.828	8	.776	1.000					
2. Metric	16.735	17	.473	1.000	2 vs. 1	.000	12.210	9	.202
3. Scalar	23.188	26	.622	1.000	3 vs. 2	.000	6.209	9	.719
4. Strict	41.112	38	.336	.986	4 vs. 3	.014	17.995	12	.116
MAL									
1. Configural	4.169	8	.842	1.000					
2. Metric	17.900	17	.395	.994	2 vs. 1	.006	13.657	9	.135
3. Partial Scalar	21.899	21	.405	.994	3 vs. 2	.000	3.984	4	.408
4. Strict	33.255	33	.455	.998	4 vs. 3	.004	11.364	12	.498

Note. $N = 315$. MGCFA = multi-group confirmatory factor analysis; *df* = degrees of freedom; CFI = comparative fit index. INT = intellectual ability; SOE = lack of social-emotional ability; MAL = maladjustment.

CHAPTER III

THREAT OR CHALLENGE?
TEACHER BELIEFS ABOUT GIFTED STUDENTS AND
THEIR RELATIONSHIP TO TEACHER MOTIVATION

ARTICLE 2:

THREAT OR CHALLENGE?

TEACHER BELIEFS ABOUT GIFTED STUDENTS AND THEIR RELATIONSHIP TO TEACHER MOTIVATION

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Abstract. This study investigated the relationship between teachers' beliefs about gifted students' characteristics compared to students with average-ability and the teachers' motivation (i.e., enthusiasm, self-efficacy). We investigated pre-service teachers' beliefs and motivational orientations as substantial components of their professional competencies and aimed to make an empirical contribution to the discussion on the professionalization of teachers in gifted education. We expected that beliefs about the gifted would be in line with the disharmony hypothesis assuming they were intellectually strong, but deficient in non-cognitive domains. German (n = 375) and Australian (n = 315) pre-service teachers participated in a between-subjects experimental design that used student vignettes varying in ability and gender. Repeated-measures ANOVAs showed that besides a high intellect, pre-service teachers from both countries associated maladjustment with giftedness and showed lower self-efficacy for teaching the gifted. Results from structural equation modeling indicated that high intelligence ratings when paired with high maladjustment ratings were associated with lower teacher motivation. This result is of high practical relevance as perceived self-efficacy relates to actual teaching behavior in a classroom. Implications for teacher education in gifted education are discussed.

Keywords: Teacher motivation; teacher self-efficacy; teacher beliefs; cross-country study; teacher education

THREAT OR CHALLENGE?

TEACHER BELIEFS ABOUT GIFTED STUDENTS AND THEIR RELATIONSHIP TO TEACHER MOTIVATION

What kinds of competencies do teachers need to be successful in their profession, especially for teaching certain student groups such as gifted and talented students? Numerous researchers have contributed to the concept of teacher competence (e.g., Klieme & Leutner, 2006; Shulman, 1986, 1987; Weinert, 2001). A current multidimensional model of teachers' professional competencies was developed by Kunter and colleagues (i.e., COACTIV, Cognitive Activation in the Classroom; Kunter, Baumert, et al., 2013; see also Kunter, Frenzel, Nagy, Baumert, & Pekrun, 2011; Kunter et al., 2008). Besides professional knowledge of pedagogy, subject-specific didactics and self-regulatory abilities to cope with job demands, this model suggests motivational orientations as well as beliefs as substantial components of teachers' professional competencies (Kunter, Klusmann, et al., 2013). The motivational orientations of teachers comprise cognitive components such as self-efficacy and affective components such as enthusiasm, which can be related to actual classroom behavior (Frenzel, Goetz, Lüdtke, Pekrun, & Sutton, 2009; Kunter et al., 2008). Teachers' beliefs involve subjective theories of teaching and learning as well as subjective theories about students' characteristics, which play an important role for the interaction with students in the school context (Voss, Kleickmann, Kunter, & Hachfeld, 2013). A case in point is teachers' subjective theory of gifted students' characteristics. Previous research revealed that both in-service and pre-service teachers can hold incorrect beliefs about gifted students combining positive attributes of high intellectual ability with social, emotional, or behavioral difficulties (e.g., Baudson & Preckel, 2013, 2016; Preckel, Baudson, Krolak-Schwerdt, & Glock, 2015). Subjective beliefs can negatively affect the expectations that teachers hold and can affect how they behave toward these students. Additionally, beliefs might relate to teachers' motivation. The present study investigated the relation between teachers' beliefs and teachers' motivational orientations with regard to gifted students. Using an experimental vignette approach, we examined the relation of student ability level to pre-service teachers' beliefs about gifted versus average-ability students' characteristics, to their

motivational orientations for teaching these students, and we examined how beliefs were related to motivational orientations (i.e., self-efficacy and enthusiasm). Previous research in this field was mostly limited to teachers of only one country. This study collected data in two countries (i.e., Australia and Germany) and examined whether we can generalize the findings on beliefs and motivational orientations over country.

1. TEACHERS' MOTIVATIONAL ORIENTATIONS: SELF-EFFICACY AND ENTHUSIASM

When defining teachers' motivational orientations as a component of their professional competence (Kunter, Baumert, et al., 2013; Kunter et al., 2011; Kunter et al., 2008; Tschannen-Moran & Woolfolk Hoy, 2001), two vital aspects need to be considered: Teachers' self-related cognitive perspective, such as self-efficacy beliefs and teachers' intrinsic motivational orientation, also known as enthusiasm.

1.1 TEACHERS' SELF-EFFICACY

Self-efficacy relates to individuals' beliefs of their capabilities to undertake successfully a particular action (Bandura, 1997). The COACTIV model (i.e., Kunter, Baumert, et al., 2013; Kunter et al., 2011; Kunter et al., 2008) used Bandura's (1997) theory of self-efficacy for defining teachers' self-efficacy as teachers' personal view of how effective and successful they are in dealing with students in learning situations. Moreover, self-efficacy determines the initiation of certain teaching actions and affects the intensity, quality, and duration of effort (Bandura, 1977; Mitchell, 1997). Especially when teaching is strenuous as might be the case with difficult or unmotivated students (Tschannen-Moran & Woolfolk Hoy, 2001), teachers' self-efficacy beliefs enable teachers to deal with challenging educational settings in an effective and competent way (Schwarzer & Jerusalem, 2002). Empirical findings in educational research support the assumption that high self-efficacy beliefs help teachers to cope with situational demands. For instance, high self-efficacy leads to higher teaching quality, the use of more effective or innovative methods to better meet the needs of their students, a higher level of teachers' occupational engagement, and less stressful symptoms (e.g., Brouwers & Tomic, 2000; Caprara, Barbaranelli, Borgogni, & Steca, 2003; Morris-Rothschild & Brassard, 2006; Schmitz &

Schwarzer, 2000; Skaalvik & Skaalvik, 2007; Wolters & Daugherty, 2007). Moreover, teachers' self-efficacy is associated with student factors, such as achievement and motivation (Caprara, Barbaranelli, Steca, & Malone, 2006). This emerging body of research suggests that teacher self-efficacy beliefs are a central component of teachers' professional competence and therefore of high significance for teaching students. However, we do not know any study that has assessed teachers' self-efficacy for teaching gifted students compared to their self-efficacy to teach average-ability students within an experimental design.

1.2 TEACHERS' ENTHUSIASM

Keller, Woolfolk Hoy, Goetz, and Frenzel (2016) reviewed the research on teacher enthusiasm conducted within the last four decades. They conceptualized teacher enthusiasm as comprising two aspects: displayed and experienced enthusiasm. While displayed enthusiasm refers to behavioral components including nonverbal expressiveness and instructional behavior, experienced enthusiasm refers to teachers' affective characteristics to which we will refer when using the term *teacher enthusiasm*. In this manner, experienced enthusiasm is defined as habitual, recurring teaching-related enjoyment and excitement (Keller et al., 2016). Kunter and colleagues (i.e., Kunter, Baumert, et al., 2013; Kunter et al., 2011; Kunter et al., 2008) applied the approach of experienced enthusiasm to consider the affective component of teacher enthusiasm and further draw a theoretical and empirical distinction between two forms: activity-related (i.e., enthusiasm for teaching and interacting with students) and topic-related (i.e., enthusiasm for teaching a subject). This conceptualization might be relatively new, but has been used in further investigations (e.g., Decker, Kunter, & Voss, 2015; Hachfeld, Hahn, Schroeder, Anders, & Kunter, 2015; Hachfeld, Schroeder, Anders, Hahn, & Kunter, 2012; Keller, Goetz, Becker, Morger, & Hensley, 2014; Richter et al., 2013).

Kunter and colleagues (i.e., Kunter, Baumert, et al., 2013; Kunter et al., 2011; Kunter et al., 2008) considered teacher enthusiasm as part of teachers' professional competence, which defines high-quality teaching and has an impact on student outcomes as it fosters students' level of interest, learning, and motivation. In this manner, empirical studies suggested that experienced enthusiasm serves as a precursor of teachers' displayed behavior in the classroom as it can motivate behavior (Frenzel et al., 2009;

Kunter et al., 2008). According to Kunter and Holzberger (2014), teachers spend greater effort and resolution on teaching if they perceive their actions as valuable and important. Thus enthusiasm is one cause of effective teaching (Brophy & Good, 1986). Especially enthusiasm for teaching and interacting with students, rather than enthusiasm for a subject, seems to be a crucial factor for student achievement and motivation (Kunter et al., 2008). However, we do not know any study that has assessed teachers' enthusiasm for teaching gifted students compared to their enthusiasm to teach average-ability students.

2. TEACHERS' BELIEFS ABOUT GIFTED STUDENTS

Beliefs filter how people perceive and interact with the world (e.g., Richardson, 1996). Thus it is not surprising that a teacher's belief system represents a cognitive component of their professional competence (Fives & Buehl, 2012). A teacher's belief system is multifaceted, including conceptions, beliefs, attitudes, worldviews, and subjective theories (Calderhead, 1996; Pajares, 1992). Subjective theories, also known as lay theories, are based on people's individual assumptions including stereotypes, of which people may not always be aware (Preckel et al., 2015).

Within research on subjective theories about gifted students' characteristics, the disharmony hypothesis (Gallagher, 1990; Neihart, 1999), arising from the mad genius stereotype (Becker, 1978), ascribes overall negative assumptions about non-cognitive characteristics to intellectually highly able persons. People who adhere to the disharmony hypothesis perceive intelligence rather positively; however, they combine giftedness with a perception of low social, emotional, or behavioral competencies. In this manner, the disharmony hypothesis states that the high intelligence comes at a cost, resulting in negative perceptions of non-cognitive characteristics. In two recent studies with German in-service and pre-service teachers, Baudson and Preckel (2013, 2016) found evidence consistent with the disharmony hypothesis, showing teachers' ambivalent beliefs toward gifted students. First, the researchers found that irrespective of professional experience, both pre-service and in-service teachers perceived gifted students as higher in intellect but as more introverted, less emotionally stable, and less agreeable than average-ability students. Second, gifted students were considered less prosocial and more maladjusted than average-ability students. Preckel et al (2015a) reported comparable findings for

implicit measures (i.e., implicit association test and affective priming tasks). Implicit associations and beliefs of pre-service teachers were in line with the disharmony hypothesis—but only for boys. In an Australian study, Carrington and Bailey (2000) asked pre-service teachers to rank hypothetical students in terms of their desirability, and gifted students were ranked lowest. Likewise, Lassig (2009) found negative attitudes toward fostering gifted children as teachers indicated limited support for the main gifted education provisions (ability grouping and acceleration) for Australian in-service teachers. In terms of acceleration, teachers reported concerns regarding social value and social adjustment. However, Lassig (2009) showed that teachers with teacher education in gifted education were more likely to have favorable attitudes toward gifted education provisions than teachers without training. In line with this finding, others have also shown these positive effects of teacher education programs and, moreover, evidence of teacher education on the nature of giftedness (for attitudes toward fostering opinions, see Cashion & Sullenger, 2000; Goodnough, 2001; Gross, 1994; Hansen & Feldhusen, 1994; Pedersen & Kronborg, 2014; Plunkett & Kronborg, 2011). Unlike specific teacher education in gifted education programs, previous research has revealed that teachers' beliefs are unrelated to their general degree of professional experience (Baudson & Preckel, 2013, 2016; Lee, Cramond, & Lee, 2004; McCoach & Siegle, 2007). Thus findings for pre-service teachers seem to be generalizable for in-service teachers.

Given the widespread adherence to the disharmony hypothesis among teachers, how correct is this hypothesis in light of empirical research findings? While high cognitive ability is a fundamental characteristic of gifted students (e.g., Sternberg & Davidson, 2005), gifted and average-ability students do not differ systematically in their social and emotional abilities and adjustment (e.g., Neihart, Reis, Robinson, & Moon, 2002; Rost, 1993). Moreover, research has shown that giftedness does not relate to psychological disorders (Freund-Braier, 2009; Martin, Burns, & Schonlau, 2009). A comparison of empirical findings for the gifted with teachers' beliefs about gifted students indicates that those beliefs are negatively biased. However, further research is required to investigate the implications of negative beliefs about gifted students' characteristics for teachers' motivation and, thus, behavior in classroom.

Findings on the potential impact of students' gender on teacher beliefs about the gifted are inconsistent. While some studies found no effect of students' gender (e.g.,

Baudson & Preckel, 2013), others have shown gender differences in teacher judgments and attitudes with more positive ratings of social-emotional components for gifted girls than for gifted boys. For instance, Busse, Dahme, Wagner, and Wieczerkowski (1986a, 1986b) showed that teachers judged gifted boys as more self-centered. Endepohls-Ulpe (2004) found ratings of social competence and social integration that are more favorable for gifted girls than boys. Preckel et al. (2015) found implicit associations of intellectual strength and maladjustment for boys only. Matheis, Keller, Kronborg, Schmitt, and Preckel (2018) investigated the interaction effects of teachers' stereotypes about giftedness and gender. In this manner, gender stereotypes are beliefs about differences between girls and boys. While being a girl is associated with communion, being a boy is linked with agency (Deaux & LaFrance, 1998) and girls are perceived as more compliant and male as more disruptive, less mature and less diligent (Jones & Myhill, 2004). In addition to disharmony beliefs (highly intelligent but maladjusted), Matheis et al. (2018) found "typical" gender stereotypes. That is, male students were perceived as less socially and emotionally competent and less adjusted than female students, which is very much in line with the "compliant girl" stereotype (Jones & Myhill, 2004). Moreover, adjustment of girls with average ability was perceived as most favorable compared to boys with average ability and gifted students in general. Therefore, Matheis et al. (2018) concluded that for gifted girls and boys, the disharmony belief overrules gender stereotypes, and, consequently, gifted male and female students are perceived as equally more maladjusted compared to average-ability students.

2.1 CROSS-COUNTRY COMPARISON

Studies that focused on individual countries provide detailed insights into beliefs about giftedness and gifted education for each country. The phenomenon of ambivalent beliefs seems not to be limited to specific countries. Several studies with pre-service as well as in-service teachers from different countries have found evidence for an overall ambivalent view of the gifted (Australia: Matheis et al., 2018; see also Carrington, 1993; Carrington & Bailey, 2000; Kronborg & Plunkett, 2012; Lassig, 2009; England, Scotland, and Australia: Geake & Gross, 2008; Germany: Baudson & Preckel, 2013, 2016; Korea: Lee et al., 2004; New Zeeland: Needham, 2012; Nigeria: Awanbor, 1991; USA: Bain, Choate, & Bliss, 2006; Cramond & Martin, 1987; Rizza & Morrison, 2003). However,

cross-country comparison studies are rarely conducted in gifted education, especially cross-country studies about teachers' professional competencies when teaching the gifted, which could address the generalizability of findings over country. Geake and Gross (2008) suggested that cross-cultural comparison studies on beliefs about gifted students would reveal similar findings of negative teacher beliefs for different countries. So far, most cross-country studies have addressed teachers' beliefs about gifted education; i.e., creating challenging learning opportunities for the gifted, ability grouping, acceleration rather than beliefs about gifted students' characteristics (see for Australia and England: Larsson, 1990; Finland and England: Ojanen & Freeman, 1994; Finland, England, and Hong Kong: Tirri, Tallent-Runnels, Adams, Yuen, & Lau, 2002; see also Tallent-Runnels, Tirri, & Adams, 2000). Only few studies compared teachers' beliefs about students' characteristics between countries. Busse et al. (1986a, 1986b) asked US-American and German teachers to rate actual gifted students' characteristics. In both countries, they found higher ratings in neuroticism and self-centeredness for the gifted, but slightly higher ratings given by German teachers. However, in this study, the researchers did not use standardized stimuli (teachers rated students of their own choice) and did not use a control group of average-ability students. Moreover, Geake and Gross (2008) examined teachers' beliefs about gifted students in England, Scotland, and Australia. Using a semantic differential, they found high cognitive ability, social misfit, and antisocial leadership as the three main characteristics associated with a gifted student. However, this study was not a "classic" cross-country comparison study as the authors used one mixed international sample for their analysis.

It is important to note that none of those cross-country studies tested for measurement invariance over country of their measures. However, measurement invariance is a precondition for ensuring the comparability of findings across countries. Thus the cultural validity of the instruments used in prior studies is at least questionable, and, therefore, the results need to be interpreted with caution.

The current study addresses a cross-country comparison for reason of generalization on the relation of teachers' professional competencies when teaching gifted students compared to teaching average-ability students. Of note, we ensured measurement invariance of measures before comparing findings over country.

3. RELATIONS BETWEEN TEACHERS' MOTIVATIONAL ORIENTATIONS AND BELIEFS ABOUT GIFTED STUDENTS

Several studies have found teachers' motivational orientations to be associated with teachers' belief system. For example, Hachfeld et al. (2012) investigated pre-service teachers' enthusiasm, self-efficacy, and prejudices toward students with immigrant backgrounds and found a positive correlation of enthusiasm and multicultural beliefs about teaching immigrants. Moreover, findings on attitudes towards inclusive education stressed the association of pre-service teachers' motivation to engage in inclusive educational provisions and their attitudes towards inclusive education (Hellmich, Görel, & Schwab, 2016).

Regarding gifted education, previous findings on teachers' motivation (Long & Woolfolk Hoy, 2006; Tschannen-Moran & Woolfolk Hoy, 2001) lead us to the assumption that teachers' beliefs about gifted students relate to teachers' motivational orientations. Furthermore, teachers' self-efficacy has been found to be linked with classroom actions (e.g., Klassen, Tze, Betts, & Gordon, 2011; Muijs & Reynolds, 2002). Enthusiasm for teaching can also relate to classroom characteristics. In this manner, Kunter et al. (2011) found positive correlations for students' motivation and teachers' enthusiasm for teaching, whereas students' disciplinary problems were negatively correlated with teachers' enthusiasm. Therefore, we conclude that the investigation of the relations between teachers' beliefs about gifted students' characteristics and their motivational orientations is of high practical relevance for the professionalization of teachers in gifted education.

4. THE PRESENT STUDY: AIMS AND RESEARCH QUESTIONS

Teachers' beliefs and motivational orientations are important parts of their professional competencies. In the present research, we aimed to investigate the following research questions: Are teachers' beliefs about students' characteristics and their motivational orientations for teaching a student affected by students' ability level (i.e., gifted vs. average-ability)? Are teachers' beliefs related to teachers' motivational orientations?

Based on our extensive literature review on teacher beliefs about gifted students, we assumed that students' ability level would relate to teachers' ratings of students' characteristics:

(1a) Comparing teachers' ratings of gifted students' and of average-ability students' characteristics, we expected that teachers would adhere to the ambivalence of the disharmony hypothesis, according to which giftedness is associated with high intellectual ability, but at the same time with social, emotional or behavioral deficits (Lee et al., 2004; McCoach & Siegle, 2007; Needham, 2012; Preckel et al., 2015). That is, we expected higher ratings on all dimensions of the disharmony hypothesis (i.e. intellectual ability, lack of social-emotional ability or maladjustment) for a gifted student as compared to a student with average-ability.

(1b) Given the lack of empirical evidence, we investigated if teachers' motivational orientations (i.e. enthusiasm and self-efficacy) vary with students' ability level as a research question without formulating hypotheses.

Teachers' beliefs are associated with their motivational orientations (Hachfeld et al., 2012, 2015; Hellmich et al., 2016; Tschannen-Moran & Woolfolk Hoy, 2001). Therefore, we investigated how teachers' beliefs about the gifted are related to teachers' motivational orientations to teach these students. Given that beliefs in accordance with the disharmony hypothesis comprise positive assumptions (i.e. high intellectual ability) as well as negative assumptions (i.e. lack of social-emotional ability, maladjustment) it might be plausible to assume differential relations between teachers' beliefs and teachers' motivational orientations. Previous research has found disciplinary problems in class to be negatively associated with teacher motivation, whereas student motivation for achievement has shown positive associations (Kunter et al., 2011):

(2) We investigated if high ratings of students' intellectual ability are positively associated with teachers' self-efficacy and enthusiasm for teaching that student and if high ratings of students' lack of social-emotional ability or maladjustment are negatively related to teachers' self-efficacy and enthusiasm.

Of note, we investigated our research questions in a sample of pre-service teachers and not in-service teachers. However, prior studies found that beliefs about gifted students do not vary between in-service and pre-service teachers (Baudson & Preckel, 2013; Lee et al., 2004; McCoach & Siegle, 2007).

We used an experimental design (i.e., vignette study), and asked pre-service teachers to rate a (gifted or average ability; female or male) student described in the vignette on three scales capturing the dimensions of the disharmony hypothesis and to rate their motivational orientations for teaching this student. In our analyses, we focused on the effects of the variation of the ability level (i.e. gifted vs. average ability). A distinct hypothesis about the relationship of students' gender with pre-service teachers' beliefs about the gifted would be rather vague because research findings are quite heterogeneous. Therefore, we specified no hypothesis but included gender as an independent variable to see if beliefs are consistent for boys and girls. However, given the high theoretical and practical relevance of gender differences, we investigated this issue in more depth in another article (Matheis et al., 2018).

Most studies on teachers' beliefs about the gifted rely on data from a single country. Thus we conducted a cross-country comparison to substantiate the findings by replication in a convenience sample of Australian and German pre-service teachers. Research on pre-service and in-service teachers' beliefs about the gifted and their education conducted in Germany (e.g., Baudson & Preckel, 2013, 2016; Busse et al., 1986a) and Australia (e.g., Carrington, 1993; Carrington & Bailey, 2000; Geake & Gross, 2008; Kronborg & Plunkett, 2012; Lassig, 2009) indicated an overall ambivalent view in line with the disharmony hypothesis in both countries. Therefore, we expected to find teacher beliefs about the gifted in line with the disharmony hypothesis in both countries. We always examined the cross-country comparison together with Hypothesis 1a and Research Question 1b and 2.

We ensured that all scales were comparable over countries (i.e. measurement invariant) and applied multigroup structural equation modeling to compare findings over groups. By doing so, we aimed to make a methodologically sound empirical contribution to the research on the professionalization of teachers in gifted education.

To situate our study and for a better understanding of the nature of our sample, we provide some basic information about the educational settings of pre-service teacher education in Germany and Australia.

4.1 TEACHER EDUCATION IN GERMANY

German teacher education is divided into two consecutive parts. First, the academic learning phase at university (3.5–4.5 years), and, second, the practical training phase at school (1.5–2 years; Cortina & Thames, 2013). Moreover, strands of secondary teacher education are typically separated according to school type (higher-secondary or academic track, *Gymnasium*; lower secondary or intermediate track, *Realschule*; vocational track, *Hauptschule*) with separate academic curricula and a different type of diploma. Pre-service teachers in training for the higher secondary track would typically emphasize content knowledge over pedagogic subjects in comparison to pre-service teachers in the intermediate or vocational track.

4.2 TEACHER EDUCATION IN VICTORIA, AUSTRALIA

In Victoria (Australia), university provides three different paths to teacher education. First, pre-service teachers can graduate within four years and obtain a single degree in education. Students do not need a consecutive Master of Education to become an in-service teacher. Second, students can combine their studies in education with a second course: Pre-service teachers study this double-degree course concurrently, in such a manner that university students will graduate after four years with two degrees (e.g., one degree in education and one in science). Third, university students can graduate in a different discipline and follow up on their first degree with a two-year teacher education program (Master of Teaching).

5. METHOD

5.1 SAMPLE

The cross-country sample included $N = 690$ pre-service teachers from Germany and Australia. The German sample consisted of $n = 375$ (61.8 % female; age $M = 22.05$ years,

SD = 3.58) pre-service teachers from the University of Trier and the University of Duisburg-Essen[5], whereas the Australian pre-service teachers were enrolled at Monash University, Victoria (*n* = 315, 71.3 % female; age *M* = 23.52 years, *SD* = 6.21). Within the German sample, we assessed undergraduate student teachers within the Bachelor of Education courses. In Germany, teachers need to complete their consecutive Master of Education to be in-service, but some are working as a student teacher during their Master of Education courses; hence we included only students within the Bachelor of Education course to ensure comparability with the Australian sample. Pre-service teachers within the Australian sample could be either students within the Bachelor of Education courses (*n* = 213) or students within the Master of Teaching courses (*n* = 92). Students enrolled in the Master of Teaching course have not been in-service yet, but there are no students in a consecutive Master of Education.

5.2 MATERIAL

5.2.1 VIGNETTES

> Michael is a student at the school where you have been teaching for one year. Michael is twelve years old and gifted. Mr. Smith, the teacher who was supposed to teach the last period of the day, has called in sick. You take over this lesson and allow the children to do homework or keep themselves busy independently. Michael flicks through an atlas and then walks towards a big world map mounted on the classroom wall. Two other children are already standing in front of the map, giggling. Michael asks the two of them: "Do you know which continent has the most people?" One of the children replies: "Why would you want to know that?" The other child walks back to his seat. Michael replies: "Well, never mind. Doesn't matter." After a while, Michael walks up to you and asks: "When will Mr. Smith be back?"

Figure 1. Vignette with condition boy (Michael) described as gifted.

We used a short text or vignette, respectively, as stimulus for teachers' ratings of a student's characteristics (see Figure 1) following the approach of comparable empirical vignette studies (Baudson & Preckel, 2013, 2016). The text described a student in an everyday school situation who first engages in an individual activity (book) and later on in a social activity (asking other students a question who react with a counter question). The situation is open to interpretation and therefore suitable to elicit stereotypes. In particular, the text contained no relevant information about the student's characteristics

[5] We would like to acknowledge Dr. Tanja Baudson for assistance in data collection at University of Duisburg-Essen, Germany.

besides his or her ability level or gender. By doing so, we reduced possible bias introduced by other information (e.g., student's socio-economic status or behaviors) and enforced participants to rely on their subjective beliefs or stereotypes about gifted or average-ability students when rating the student's characteristics. The cover story of the experiment was that the study examined mechanisms underlying impression formation, based on minimal information. We ensured that the vignette was neutral regarding the student's characteristics under study in a pilot study by demonstrating that participants gave neutral ratings (i.e. used the neutral middle category of a scale) when rating the same student without the information on his ability level (see Appendix A for results). We experimentally manipulated the two factors ability level (gifted vs. average) and gender (girl named Michaela$_{(Germany)}$/Karen$_{(Australia)}$ vs. boy named Michael$_{(both\ countries)}$) resulting in four different experimental conditions or vignette types used in a between-subjects design (that is, one vignette type per participant). By evaluating teachers' ratings of a gifted student relative to their ratings of an average-ability student in this experiment, we were able to assess their specific beliefs about gifted students while controlling for their beliefs about average-ability students, which might resemble their general beliefs related to students. Further, interpreting ratings of a gifted student relative to ratings of an average-ability student described with the identical text controls for a possible biasing impact of the text.

5.2.2 BELIEFS AND MOTIVATIONAL ORIENTATIONS

We used a newly created questionnaire, which was developed and piloted within several Bachelor and Master Theses (Matheis, 2015; see also Issa, 2016; Rumanyika, 2016; Schmitt, 2016). The questionnaire consists of 21 items rated on a 6-point Likert-scale (1 = false and 6 = true). It assesses five dimensions. Three dimensions capture beliefs in the context of the disharmony hypothesis (i.e., intellectual ability, lack of social-emotional ability, maladjustment). Two dimensions capture the motivational orientations (i.e., enthusiasm, self-efficacy); items for these dimensions were adapted from a pre-existing questionnaire (Hachfeld et al., 2012). (1) Five items assessed the belief about students' intellectual ability (This child is smart; …obtains good grades; …is clever; …is intelligent; …is competent). (2) Four items assessed the belief about students' lack of social-emotional ability (This child lacks social skills; …is withdrawn; I rate the child's

social-emotional ability rather negatively; I rate the child's social-emotional ability rather positively [inverted item]). (3) The belief about students' maladjustment was assessed by four items that describe behavioral or adjustment difficulty (Teaching this child is strenuous; This child is intolerant; This child considers himself/herself superior to everyone else; This child displays behavioral difficulty). (4) Teachers' experienced enthusiasm to teach the child was assessed by four items (I would enjoy teaching this child; I think it would be fun to work with this child; I would like to teach this child; I rate this child rather positively). (5) Four items assessed teachers' perceived self-efficacy to teach the child (I think myself capable to adapt my teaching to the needs of this child; I am confident that I'd be able to provide challenging tasks and support for this child; …that I can cater for this child's individual needs; …that I could spark enthusiasm in this child for the subject I teach.). The reliabilities (McDonald's Omega) and descriptive statistics of the scales for each of these dimensions are given in Table 1.

Table 1. Internal Consistencies (McDonald's Omega), means, and standard deviations of the five dimensions of the questionnaire based on latent factor scores by vignettes and countries.

	Germany[a]								Australia[b]							
	Average boy (n = 97)		Gifted boy (n = 98)		Average girl (n = 91)		Gifted girl (n = 89)		Average boy (n = 71)		Gifted boy (n = 81)		Average girl (n = 80)		Gifted girl (n = 83)	
	ω	*M* (*SD*)	ω	*M* (*SD*)	ω	*M* (*SD*)	ω	*M* (*SD*)	ω	*M* (*SD*)	ω	*M* (*SD*)	ω	*M* (*SD*)	ω	*M* (*SD*)
INT	.81	–0.49 (0.53)	.89	0.00 (0.69)	.86	–0.26 (0.56)	.85	0.17 (0.63)	.84	–0.14 (0.55)	.83	0.32 (0.53)	.79	–0.09 (0.59)	.88	0.29 (0.68)
SOE	.81	–0.11 (.059)	.75	0.00 (0.49)	.81	–0.10 (0.56)	.82	–0.14 (0.60)	.78	–0.17 (0.53)	.78	–0.25 (0.49)	.82	–0.55 (0.65)	.74	–0.46 (0.50)
MAL	.74	–0.23 (0.54)	.76	0.00 (0.50)	.72	–0.33 (0.44)	.71	–0.08 (0.51)	.72	–0.06 (0.47)	.73	0.13 (0.49)	.68	–0.71 (0.43)	.69	0.03 (0.48)
ENT	.87	–0.02 (0.72)	.85	0.00 (0.62)	.88	0.24 (0.68)	.88	0.00 (0.77)	.80	0.39 (0.53)	.90	0.32 (0.72)	.74	0.45 (0.51)	.81	0.57 (0.54)
SEL	.76	0.26 (0.54)	.64	0.00 (0.33)	.87	0.48 (0.58)	.81	0.06 (0.57)	.85	0.76 (0.56)	.78	0.46 (0.78)	.86	0.86 (0.58)	.78	0.75 (0.51)

Note. [a]n = 375. [b]n = 315. ω = McDonald's Omega. INT = intellectual ability; SOE = lack of social-emotional ability; MAL = maladjustment; ENT = enthusiasm for teaching the student; SEL = self-efficacy for teaching the student.

5.2.3 DEMOGRAPHICS

Pre-service teachers indicated their level of experience with gifted students and knowledge on the subject of giftedness on a 5-point Likert-scale (1 = none and 5 = a lot). Further, they reported their age and gender.

5.3 DESIGN AND PROCEDURE

We randomly assigned pre-service teachers to one of the four vignette conditions in each country, which ascribed 71 to 98 pre-service teachers per country to each condition. After reading the vignette, participants started with the questionnaire assessing their beliefs about gifted students as well as their enthusiasm and self-efficacy when teaching that student. Finally, pre-service teachers reported their demographic data. We distributed hard-copy questionnaires as part of pre-service teachers' regular university classes. The participation was voluntary and took approximately 10 minutes. As the sample size showed fewer participants for the male vignette in Australia, we additionally assessed 46 participants online. A preliminary measurement invariance testing across online and hard-copy samples indicated at least partial scalar measurement invariance (Appendix B; see Data Analyses for further explanations); therefore, latent means of both subgroups were comparable. Hence, we combined data for further analysis.

5.3.1 PRELIMINARY STEPS

Using the back- translation method (Brislin, 1986), we ensured accuracy of the translation for the vignette and the questionnaire: First, the German questionnaire version was translated into English by the first author. Second, third-parties cross-checked the translation, and an Australian researcher (second author; native English speaker) proofread it to account for correct English. Third, an independent third-party (native German speaker) back translated the questionnaire into German. In addition, we conducted a pilot study with a group of pre-service teachers at Monash University, Victoria. Wording was further refined to ensure clarity in meaning.

5.4 DATA ANALYSES

5.4.1 MEASUREMENT INVARIANCE TESTS

When comparing groups from different countries or across experimental conditions inter alia vignettes, researchers must ensure that the instrument measures the same psychological construct in all groups (see Milfont & Fischer, 2010). Therefore, the establishment of measurement invariance (MI) is required to produce valid comparisons and meaningful interpretations. We tested the assumption of MI empirically with multigroup confirmatory factor analysis (MGCFA; Jöreskog, 1971; Steenkamp & Baumgartner, 1998) as this approach is typically used to test for cross-country equivalence (Davidov, Meuleman, Cieciuch, Schmidt, & Billiet, 2014). The MGCFA approach compares the less restricted with models that are more restricted by adapting the measurement parameters. Several hierarchically ordered levels of MI can be distinguished (Steenkamp & Baumgartner, 1998): configural, metric, scalar, and strict equivalence. (1) Configural invariance is defined as the same factorial structure. (2) Metric invariance is given when there are equal factor loadings across groups. (3) Scalar invariance is required to compare latent means (Marsh et al., 2010, 2009). It is defined as identical intercepts of items across groups and implies equal difficulties of the items across groups. (4) With strict invariance—also known as error variance invariance (see Milfont & Fischer, 2010)—the comparison of manifest scale means across groups is valid. Of note, not all parameters need to be equal across groups: Valid comparisons can also be made if some parameters are invariant (Byrne, Shavelson, & Muthén, 1989; Steenkamp & Baumgartner, 1998). This so-called partial MI is supported when parameters of at least one indicator besides the marker indicator are equal across groups. We used a stepwise strategy of testing increasing MI levels against each other. A more restrictive model (higher level of MI) was supported if there were only small changes in the comparative fit index (CFI), i.e. if differences between the CFI of two models are .01 or less (Chen, 2007; Cheung & Rensvold, 2002).

The comparison of factor means across groups is meaningful only if the factor loadings and item intercepts are invariant (Brown, 2015). Thus after establishing (partial) scalar MI (see Results), we used latent factor scores assuming (partial) scalar MI for each of the five dimensions (intellectual ability, lack of social-emotional ability,

maladjustment, self-efficacy, enthusiasm) in our main analysis to examine the effect of ability, country, and gender. Therefore, we derived factor scores for each of the five dimensions from MGCFA across all eight groups; i.e., four experimental conditions (Ability × Gender) and country (Germany and Australia). MGCFA does not estimate the absolute values of factor means for each group, but rather the differences in factor means between one reference group and each comparison group (Byrne, 2006). Hence, the factor means of the reference group (i.e., boy/gifted within Germany) were fixed to zero and the factor means of the comparison groups were estimated as free parameters.

5.4.2 ANALYSIS OF VARIANCE

We investigated our first research question on the relation of students' ability level with teachers' ratings of students' characteristics and their motivational orientations using analyses of variance with IBM SPSS Statistics for Windows, Version 23 (2015). First, we ran the analysis for the cross-country sample including all participants. Second and third, we computed the same analysis for the German and Australian samples separately. We used repeated-measures analysis of variance (ANOVA) to analyze the five dimensions (three scales for students' characteristics, two motivational scales) as one participant repeatedly rated one vignette on several dimensions of the questionnaire. Thus the ratings of the five dimensions were not independent, an issue that we considered with the repeated- measures ANOVA. Hence, our dependent variable was one factor with five repeated measures. The two vignette conditions (ability, gender) and teachers' country were included as between-group independent variables. Following the significant main effects of repeated-measures ANOVAs, we conducted separate univariate ANOVAs for each dimension with students' ability and gender as well as pre-service teachers' country as predictors.

5.4.3 MULTI-GROUP STRUCTURAL EQUATION MODELING

For assessing the relation between students' ability level, teachers' beliefs, and motivational orientations (see Figure 2), we used regression analysis within a multigroup structural equation model (MGSEM). Certain parameters in MGSEM can be restricted to be equal, while others are allowed to vary across groups. We tested equality and

differences of regression parameters across multiple groups for examining whether functional relations between variables in our four groups (boy/Germany, girl/Germany, boy/Australia, girl/Australia) were comparable (Hayduk, 1987). First, we freely estimated the same model within each of the four groups defined on a grouping variable. Second, we performed multiple group comparisons over the four groups to investigate possible differences in regression paths. We tested the significance of the difference of every path coefficient between the class types by Wald confidence intervals (Cheung, 2009). Third, we tested direct and indirect effects of students' ability level on pre-service teachers' enthusiasm and perceived self-efficacy via their belief dimensions across the four groups.

For both, measurement invariance testing (MGCFA) and MGSEM, we used the statistical software *Mplus* 7.4 (Muthén & Muthén, 1998–2015). Considering that the distributions of item scores differed from multivariate normality, we chose a robust maximum likelihood estimation (MLR estimator). When robust estimators for model estimation are used, the model χ^2-statistics cannot be directly compared (Muthén & Muthén, 1998–2015). Thus we computed scale differences in χ^2-values for nested model comparisons. We evaluated model fits according to criteria suggested by Hu and Bentler (1999).

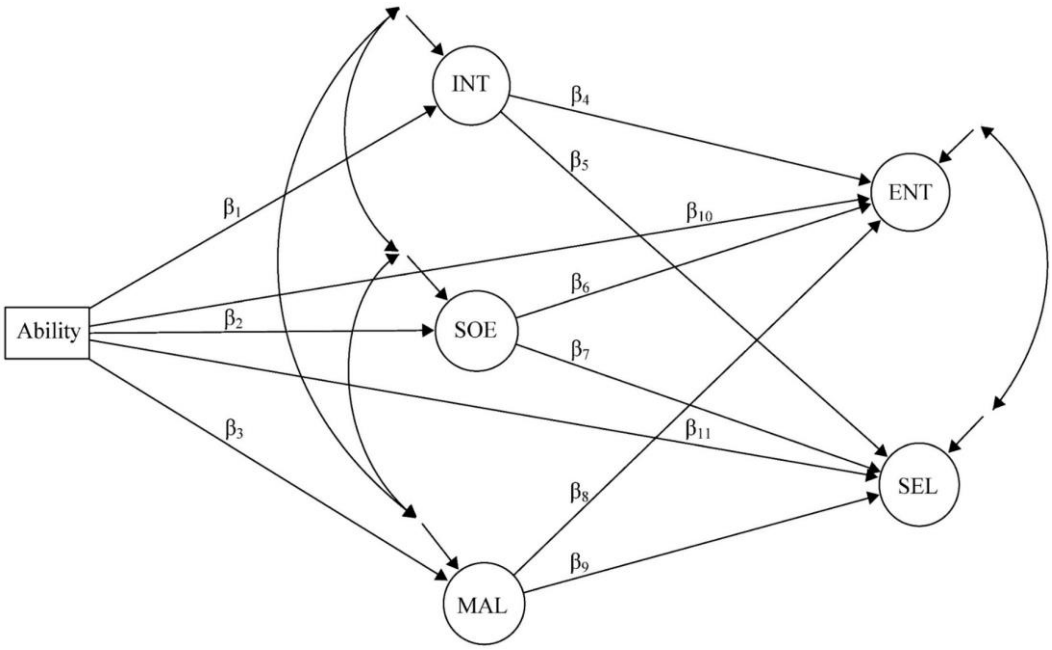

Figure 2. MGSM for the four groups (boy/Germany, boy/Australia, girl/Germany, girl/Australia. INT = intellectual ability; SOE = lack of social-emotional ability; MAL = maladjustment; ENT = enthusiasm for teaching the student; SEL = self- efficacy for teaching the student.

6. RESULTS

6.1 PRELIMINARY FINDINGS

6.1.1 MEASUREMENT INVARIANCE

Strict MI across countries and vignettes (i.e., ability and gender) held only for the dimension "lack of social-emotional ability" (difference between the CFI $\leq .01$ and nonsignificant χ^2 difference tests; see Appendix C). However, (partial) scalar MI held for all dimensions so that the comparison of latent factor means across countries and vignettes was feasible. Subsequently, we estimated factor scores assuming (partial) scalar MI for each of the five dimensions with MGCFA across all eight groups. We employed the German vignette of a gifted boy as reference group (latent means of zero). Table 1 reports descriptive statistics including means, standard deviations of latent factor scores, and reliabilities (McDonald's Omega; Brunner, Nagy, & Wilhelm, 2012) for the five dimensions of our questionnaire.

6.1.2 DEMOGRAPHICS

Participants reported little experience with gifted students (Germany: $M = 1.99$, $SD = 0.90$; Australia: $M = 2.35$, $SD = 0.96$) and little knowledge about the subject of giftedness (Germany: $M = 2.22$, $SD = 0.69$; Australia: $M = 2.71$, $SD = 0.82$). The Australian sample reported significantly more experience with gifted students, $t(644.06) = -4.95$, $p \leq .001$, and more knowledge about giftedness, $t(597.73) = -8.47$, $p \leq .001$. Neither experience or knowledge nor other demographic variables (i.e., age and gender) correlated highly with the five dimensions of our questionnaire (Table 2; strongest correlation of –.27— that is, maximum of 7% shared variance). Therefore, we did not include these variables in further analysis. Table 2 reports correlations in detail.

Table 2. Correlations between factors of the questionnaire, pre-service teachers' demographic data, country, and experimental groups.

	INT		SOE		MAL		ENT		SEL	
INT	—									
SOE	.05	(G)	—							
	–.20***	(A)								
MAL	.07	(G)	.44***	(G)	—					
	–.11	(A)	.46***	(A)						
ENT	.25***	(G)	–.29***	(G)	–.45***	(G)	—			
	.41***	(A)	–.33***	(A)	–.37***	(A)				
SEL	.11*	(G)	–.12*	(G)	–.31***	(G)	.60***	(G)	—	
	.17**	(A)	–.30***	(A)	–.31***	(A)	.59***	(A)		
Demographics										
Age (years)	–.10	(G)	–.10	(G)	–.00	(G)	.06	(G)	.12*	(G)
	–.08	(A)	–.27***	(A)	–.10	(A)	.17**	(A)	.21***	(A)
Gender (0 = female, 1 = male)	–.07	(G)	.02	(G)	.02	(G)	.09	(G)	.05	(G)
	–.15**	(A)	.11*	(A)	.07	(A)	–.11	(A)	–.07	(A)
Experiences (1 = *none*, 5 = *a lot*)	–.04	(G)	–.06	(G)	.05	(G)	.12*	(G)	.12*	(G)
	.07	(A)	.06	(A)	.01	(A)	.09	(A)	.15**	(A)
Knowledge (1 = *none*, 5 = *a lot*)	.08	(G)	–.02	(G)	–.01	(G)	.12*	(G)	.07	(G)
	.08	(A)	.11	(A)	.03	(A)	.08	(A)	.07	(A)
Experimental groups										
Country (0 = G[a], 1 = A[b])	.19***		–.24***		.01		.28***		.40***	
Ability (0 = average, 1 = gifted)	.35***	(G)	.03	(G)	.24***	(G)	–.07	(G)	–.31***	(G)
	.33***	(A)	.01	(A)	.42***	(A)	.02	(A)	–.16**	(A)
Gender (0 = girl, 1 = boy)	–.15**	(G)	.06	(G)	.09	(G)	–.09	(G)	–.14**	(G)
	.00	(A)	.26***	(A)	.33***	(A)	–.13*	(A)	–.16**	(A)

Note. G = Germany; A = Australia; INT = intellectual ability; SOE = lack of social-emotional ability; MAL = maladjustment; ENT = enthusiasm for teaching the student; SEL = self-efficacy for teaching the student. [a]n = 375. [b]n = 315.
*$p \leq .05$. **$p \leq .01$. ***$p \leq .001$.

6.2 IMPACT OF STUDENTS' ABILITY ON TEACHERS' BELIEFS AND MOTIVATIONAL ORIENTATIONS

While examining the impact of students' ability on teachers' beliefs (Hypothesis 1a) and motivational orientations (Research Question 1b), we always test for cross-country replicability. Table 3 displays statistical values of repeated-measures and univariate ANOVAs for the cross-country, German, and Australian samples. Figure 3 illustrates means.

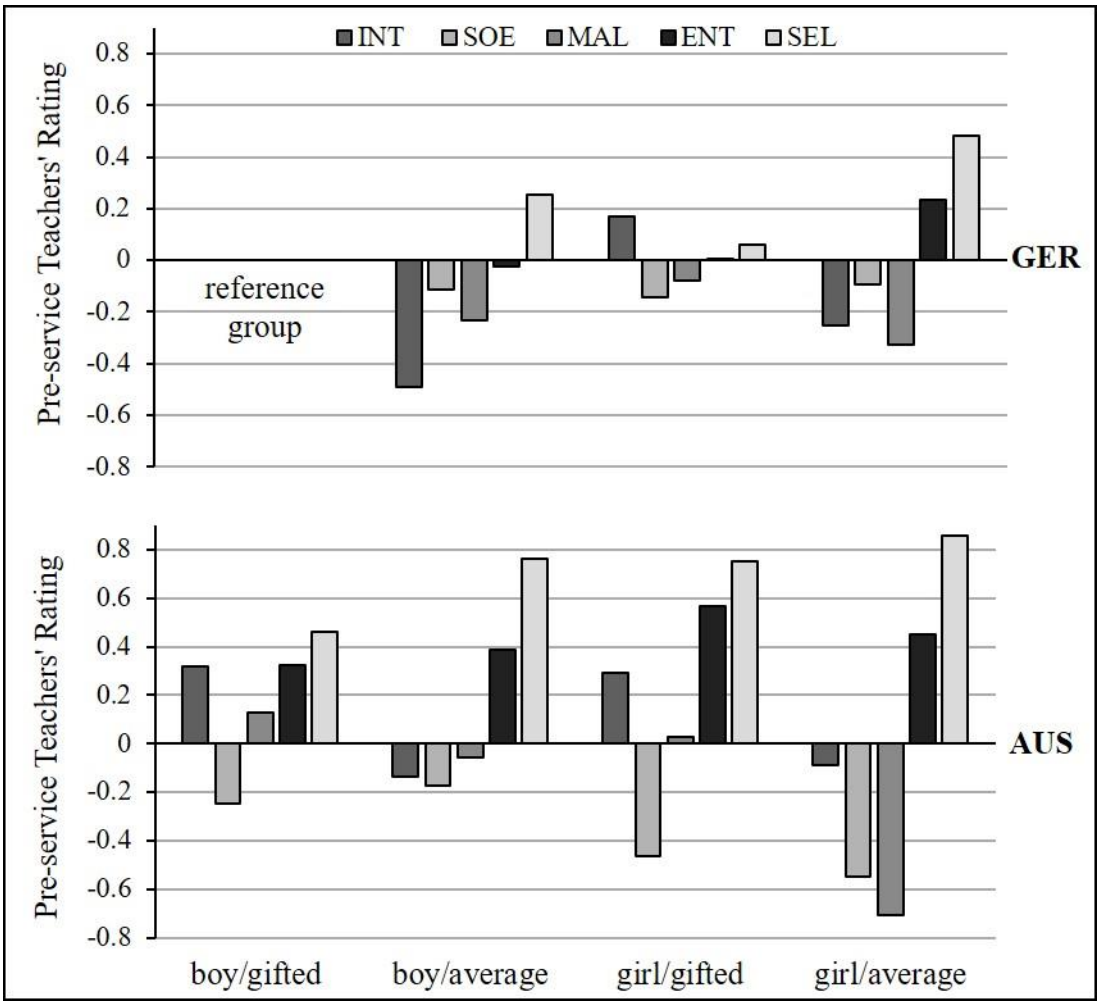

Figure 3. Results of repeated- measures ANOVAs for the eight groups (ability, country, gender). The figure shows latent factor scores, boy/gifted within Germany functions as reference group. *N* = 690. GER = Germany; AUS = Australia; INT = intellectual ability; SOE = lack of social-emotional ability; MAL = maladjustment; ENT = enthusiasm for teaching the student; SEL = self-efficacy for teaching the student.

Table 3. Repeated-measures and univariate analysis of variance for the effects of ability, gender, and country on pre-service teachers' rating on students' intellectual ability, lack of social-emotional ability, maladjustment, enthusiasm, and self-efficacy for teaching the student.

Repeated-Measures							
		Cross-country		Germany		Australia	
		$F(2.62,1781.72)$	η^2	$F(2.56,946.41)$	η^2	$F(2.55,791.06)$	η^2
	Dimensions (D)	172.66^{***}	.20	27.23^{***}	.07	182.92^{***}	.37
	D × Ability (A)	45.48^{***}	.06	27.71^{***}	.07	20.12^{***}	.06
	D × Gender (G)	19.46^{***}	.03	5.06^{**}	.01	16.57^{***}	.05
	D × Country (C)	50.94^{***}	.07				
	D × A × G	2.60	.00	0.83		2.98^{*}	.01
	D × C × A	1.68					
	D × C × G	3.16^{*}	.01				
	D × A × G × C	1.39					
Univariate Analysis							
		Cross-country		Germany		Australia	
		$F(1,680)$	η^2	$F(1,370)$	η^2	$F(1,310)$	η^2
INT	Ability (A)	90.12^{***}	.12	52.79^{***}	.13	38.79^{***}	.11
	Gender (G)	5.33^{*}	.01	10.30^{**}	.03	0.03	
	Country (C)	27.02^{***}	.04				
	A × G	0.57		0.27		0.23	
	C × A	0.18					
	C × G	4.29^{*}	.01				
	A × G × C	0.00					
SOE	Ability (A)	0.19		0.32		0.00	
	Gender (G)	17.70^{***}	.03	1.17		22.62^{***}	.07
	Country (C)	39.88^{***}	.06				
	A × G	0.00		1.98		1.73	
	C × A	0.11					
	C × G	7.48^{**}	.01				
	A × G × C	3.68	.01				
MAL	Ability (A)	89.16^{***}	.12	21.90^{***}	.06	76.01^{***}	.20
	Gender (G)	38.77^{***}	.05	2.78	.01	50.97^{***}	.14
	Country (C)	0.05					
	A × G	14.26^{***}	.02	0.03		26.55^{***}	.08
	C × A	8.57^{**}	.01				
	C × G	15.24^{***}	.02				
	A × G × C	12.49^{***}	.02				
ENT	Ability (A)	0.67		2.23		0.16	
	Gender (G)	8.01^{**}	.01	3.16	.01	5.38^{*}	.02
	Country (C)	58.39^{***}	.08				
	A × G	0.13		3.25	.01	2.02	
	C × A	1.83					
	C × G	0.06					
	A × G × C	5.08^{*}	.01				
SEL	Ability (A)	39.14^{***}	.05	41.03^{***}	.10	8.24^{**}	.03
	Gender (G)	15.09^{***}	.02	7.32^{**}	.02	7.52^{**}	.02
	Country (C)	139.18^{***}	.17				
	A × G	0.04		2.52		2.05	
	C × A	2.56					
	C × G	0.32					
	A × G × C	4.55^{*}	.01				

Note. Degrees of freedom *(df)* for repeated ANOVAs were corrected using Greenhouse-Geisser estimates of sphericity; Cross-country: $N = 690$, Mauchly's $W = .40$, $\chi^2(9) = 628.39$, $p \leq .001$, $\varepsilon = .66$; Germany: $N = 375$, Mauchly's $W = .36$, $\chi^2(9) = 369.71$, $p \leq 001$, $\varepsilon = .64$; Australia: $N = 315$, Mauchly's $W = .36$, $\chi^2(9) = 315.03$, $p \leq .001$, $\varepsilon = .64$; INT = intellectual ability; SOE = lack of social-emotional ability; MAL = maladjustment; ENT = enthusiasm for teaching the student ; SEL = self-efficacy for teaching the student.
$^{*}p \leq .05$. $^{**}p \leq .01$. $^{***}p \leq .001$.

6.2.1 INTELLECTUAL ABILITY

As expected (Hypothesis 1a), the three separate ANOVAs for cross-country, German, and Australian samples indicated significant main effects of ability. Gifted students received higher intellectual ability ratings than average-ability students (Cross-country: $d = 0.72$, medium effect; Germany: $d = 0.74$, medium effect; Australia: $d = 0.70$, medium effect). For the cross-country sample, a significant main effect for gender was found with lower ratings for boys than for girls ($d = 0.20$, small effect). The significant main effect for country indicated overall higher ratings in Australia than in Germany ($d = 0.40$, small effect). Additionally, the significant interaction of country and gender indicated differences in ratings for boys and girls between countries. In this manner, separate ANOVAs by country showed that gender did affect ratings in Germany only (Germany: $d = 0.30$, small effect; Australia: $d = 0.00$, no effect).

6.2.2 LACK OF SOCIAL-EMOTIONAL ABILITY

Analysis for the cross-country sample yielded a significant main effect for gender with higher ratings for boys than for girls ($d = 0.31$, small effect). Furthermore, country had a significant main effect. German pre-service teachers indicated an overall higher rating than the Australians did ($d = 0.50$, medium effect). Moreover, country and gender interacted significantly. In this manner, separate analysis for countries clarified that only Australian pre-service teachers ascribed a higher lack of-social-emotional ability to boys than to girls (Germany: $d = 0.11$, no effect; Australia: $d = 0.53$, medium effect). Against our expectation (Hypothesis 1a), there was no significant main effect of ability (see Table 3).

6.2.3 MALADJUSTMENT

In line with our expectation (Hypothesis 1a), the three separate ANOVAs for the cross-country sample, German sample, and Australian sample indicated significant main effects of ability. Gifted students were rated as significantly less adjusted compared to students with average ability (Cross-country: $d = 0.69$, medium effect; Germany*:* $d = 0.48$, medium effect, Australia: $d = 0.93$, large effect), whereas the significant interaction of

country and ability indicated that this difference was greater in the Australian sample. Moreover, the cross-country analysis indicated a significant main effect for gender with higher ratings for boys than for girls (d = 0.42, small effect). The significant interaction of country and gender and separate country specific ANOVAs showed that differences in ratings between boys and girls were valid for the Australian sample, but not for the German sample (Germany: d = 0.17, no effect; Australia: d = 0.70, medium effect). The significant interaction of ability and gender within the cross-country sample showed that when a boy or girl was labeled as gifted, both were perceived as having high adjustment problems, whereas average-ability girls received lower maladjustment ratings than average-ability boys (gifted: d = 0.17, no effect; average: d = 0.70, medium effect). Separate analysis for country showed that this significant interaction effect was valid for Australia only (see Table 3). Moreover, we observed a significant three-way interaction with ability, gender, and country. This interaction showed that gender differences in the Australian sample were found for gifted and average-ability students, whereby gifted boys were rated highest and average-ability girls lowest.

6.2.4 ENTHUSIASM

Analysis of the cross-country sample yielded no significant main effect of ability (Research Question 1b). The significant main effect for gender indicated higher enthusiasm for teaching a girl than for teaching a boy (d = 0.23, small effect). Moreover, country yielded a significant main effect with overall higher enthusiasm ratings in Australia (d = 0.59, medium effect). Furthermore, we observed a significant three-way interaction of ability, gender, and country. Using the results from country-specific ANOVAs, which yielded a significant main effect of gender for Australian pre-service teachers only (d = 0.27, small effect), this interaction showed that in Germany gender was unrelated to enthusiasm ratings for the gifted but related to enthusiasm ratings for average-ability students (d = 0.37, small effect). In this manner, German pre-service teachers reported comparable enthusiasm for teaching a gifted boy, a gifted girl, and an average-ability boy, but their enthusiasm was highest for teaching an average-ability girl. Opposite to this, Australian pre-service teachers reported lower enthusiasm for teaching boys than for girls (d = 0.27, small effect), but their enthusiasm did not depend on student ability.

6.2.5 SELF-EFFICACY

The three separate ANOVAs for the cross-country sample, German sample, and Australian sample indicated significant main effects of ability (Research Question 1b) with higher self-efficacy for teaching an average-ability student than a gifted student (Cross-country: $d = 0.42$, small effect; Germany: $d = 0.65$, medium effect; Australia: $d = 0.32$, small effect). ANOVA with the cross-country sample showed a significant main effect for gender, with higher self-efficacy ratings for teaching girls than boys ($d = 0.31$, small effect). Country showed a significant main effect indicating that Australian pre-service teachers reported higher self-efficacy than German pre-service teachers did ($d = 0.87$, large effect). The significant three-way interaction of ability, gender, and country showed that in Australia self-efficacy ratings for teaching gifted girls and average-ability boys were similar ($d = 0.02$, no effect), whereas ratings for average-ability girls and gifted boys showed a marked difference with more favorable ratings for average-ability girls ($d = 0.57$, medium effect).

6.2.6 TEACHERS' BELIEFS AND THEIR RELATION TO TEACHERS' MOTIVATIONAL ORIENTATIONS

To investigate Research Question 2 on relations of teachers' beliefs with their motivational orientations as well as their cross-country replicability, we performed a MGSEM analysis based on the overall data from the 690 pre-service teachers (see Figure 2). We started by establishing a baseline SEM for each of the four groups separately (i.e., boy/Germany, boy/Australia, girl/Germany, girl/Australia). Reflecting the criteria of Hu and Bentler (1999), we evaluated the fit of the baseline model for all four groups as acceptable (boy/Germany: $N = 195$, $\chi^2 = 40.360$, $df = 30$, CFI = .986, RMSEA = .042, SRMR = .035; boy/Australia: $N = 152$, $\chi^2 = 65.075$, $df = 30$, CFI = .953, RMSEA = .088, SRMR = .035; girl/Germany: $N = 180$, $\chi^2 = 76.638$, $df = 30$, CFI = .936, RMSEA = .093, SRMR = .050; girl/Australia: $N = 163$, $\chi^2 = 63.623$, $df = 30$, CFI = .918, RMSEA = .083, SRMR = .056). Next, we simultaneously estimated the model within each group in a multi-group comparison, and again, model fit was acceptable ($N = 690$, $\chi^2 = 315.816$, $df = 150$, CFI = .935, RMSEA = .080, SRMR = .063). The inspection of confidence intervals revealed that all regression paths were comparable across groups.

Students' ability level was positively related to intelligence and maladjustment ratings — except for boys in the Australian teacher sample — but not significantly related to ratings of students' lack of social-emotional ability (see $\beta_{1,}$ β_2 and β_3 in Table 4). Higher intelligence ratings were positively related to teachers' enthusiasm (exception: girls in the Australian sample) and teachers' self-efficacy (see β_4 and β_5 in Table 4). Ratings of students' lack of social-emotional ability were unrelated to teachers' motivational orientations (see β_6 and β_7 in Table 4). Furthermore, ratings of students' maladjustment were negatively related to teachers' enthusiasm (exception: boys in the Australian sample) and self-efficacy (see β_8 and β_9 in Table 4). Moreover, students' ability level had a significant negative direct effect on teachers' enthusiasm (see β_{10} in Table 4) — except for girls in the Australian sample. Only for boys in the Australian sample, higher ability ratings went along with lower ratings of teachers' self-efficacy (see β_{11} in Table 4).

Next, we tested indirect effects from students' ability level on enthusiasm and self-efficacy via intellectual ability, lack of social-emotional ability, and maladjustment (see Table 5). Specific indirect effects for ability level and enthusiasm were found via intellectual ability (exception: girls in the Australian sample) and via maladjustment for boys and girls in the German sample. We found specific indirect effects for ability level and self-efficacy via intellectual ability (all four groups) and via maladjustment (exception: boys in the Australian sample). Overall, in both countries, the models explained a significant amount of variance in pre-service teachers' enthusiasm (boy/Germany: $R^2 = .269$, $p = .002$; boy/Australia: $R^2 = .333$, $p = .001$; girl/Germany: $R^2 = .332$, $p = .000$; girl/Australia: $R^2 = .243$, $p = .004$), and perceived self-efficacy (boy/Germany: $R^2 = .534$, $p = .000$; boy/Australia: $R^2 = .674$, $p = .000$; girl/Germany: $R^2 = .600$, $p = .000$; girl/Australia: $R^2 = .626$, $p = .000$).

Table 4. Model regression results for the groups with ability, latent factor scores of student variables (INT, SOE, MAL), and latent teacher variables (ENT, SEL).

	Boy/GER		Boy/AUS		Girl/GER		Girl/AUS	
β_1	.483***	[.275, .690]	.453***	[.243, .664]	.371***	[.157, .585]	.415***	[.182, .648]
β_2	.112	[–.103, .326]	–.102	[–.342, .139]	–.070	[–.310, .171]	.219	[–.040, .478]
β_3	.366**	[.111, .620]	.174	[–.085, .434]	.398**	[.151, .644]	.316*	[.045, .588]
β_4	.239***	[.097, .381]	.573***	[.311, .835]	.396*	[.078, .714]	–.024	[–.226, .178]
β_5	.445***	[.272, .618]	.668***	[.449, .887]	.543***	[.312, .774]	.324***	[.126, .522]
β_6	.216	[–.044, .477]	.005	[–.391, .402]	–.062	[–.309, .184]	–.148	[–.399, .103]
β_7	.079	[–.137, .295]	–.063	[–.314, .189]	–.046	[–.308, .216]	.090	[–.159, .339]
β_8	–.363***	[–.565,–.162]	–.244	[–.744, .256]	–.325*	[–.599,–.050]	–.314*	[–.588,–.040]
β_9	–.571***	[–.794,–.348]	–.375*	[–.693,–.057]	–.520***	[–.803,–.237]	–.476***	[–.764,–.188]
β_{10}	–.156	[–.328, .016]	–.456***	[–.722,–.189]	–.372*	[–.664,–.080]	.086	[–.124, .296]
β_{11}	.019	[–.165, .203]	–.220*	[–.425,–.014]	–.172	[–.396, .053]	.068	[–.133, .268]

Note. $N = 690$. Numbers in brackets are 95% confidence intervals of the regression coefficients. GER = Germany; AUS = Australia; INT = intellectual ability; SOE = lack of social-emotional ability; MAL = maladjustment; ENT = enthusiasm for teaching the student; SEL = self-efficacy for teaching the student. β_1 = INT on ability; β_2 = SOE on ability; β_3 = MAL on ability; β_4 = ENT on INT; β_5 = SEL on INT; β_6 = ENT on SOE; β_7 = SEL on SOE; β_8 = ENT on MAL; β_9 = SEL on MAL; β_{10} = ENT on ability; β_{11} = SEL on ability.

*$p \leq .05$. **$p \leq .01$. ***$p \leq .001$.

Table 5. Model results (MGSEM) for the direct and indirect effects of students' ability on teacher enthusiasm and self-efficacy.

	Boy/GER		Boy/AUS		Girl/GER		Girl/AUS	
Enthusiasm								
Total	–.149	[–.323, .024]	–.239	[–.481, .003]	–.350**	[–.573,–.126]	–.056	[–.267, .156]
Total indirect	.007	[–.116, .130]	.217	[–.013, .447]	.022	[–.180, .224]	–.142	[–.303, .019]
Specific indirect								
INT ability	.115**	[.032, .199]	.260**	[.096, .423]	.147**	[.035, .258]	–.010	[–.094, .074]
SOE ability	.024	[–.031, .080]	–.001	[–.041, .040]	.004	[–.018, .026]	–.032	[–.103, .038]
MAL ability	–.133*	[–.248,–.017]	–.043	[–.152, .067]	–.129	[–.263, .005]	–.099	[–.223, .025]
Direct ability	–.156	[–.328, .016]	–.456***	[–.722,–.189]	–.372*	[–.664,–.080]	.086	[–.124, .296]
Self-efficacy								
Total	.033	[–.163, .230]	.024	[–.202, .250]	–.174	[–.393, .046]	.071	[–.121, .264]
Total indirect	.015	[–.166, .196]	.244*	[.002, .486]	–.002	[–.218, .214]	.004	[–.196, .203]
Specific indirect								
INT ability	.215***	[.097, .332]	.303***	[.140, .466]	.201***	[.089, .314]	.134**	[.035, .234]
SOE ability	.009	[–.021, .039]	.006	[–.023, .036]	.003	[–.017, .023]	.020	[–.042, .081]
MAL ability	–.209**	[–.365,–.053]	–.065	[–.181, .051]	–.207*	[–.375,–.039]	–.150	[–.311, .010]
Direct ability	.019	[–.165, .203]	–.220*	[–.425,–.014]	–.172	[–.396, .053]	.068	[–.133, .268]

Note. $N = 690$. Numbers in brackets are 95% confidence intervals of the regression coefficients. 0 = average, 1 = gifted. GER = Germany; AUS = Australia; INT = intellectual ability; SOE = lack of social-emotional ability; MAL = maladjustment.
$^{*}p \leq .05$. $^{**}p \leq .01$. $^{***}p \leq .001$.

7. DISCUSSION

The evaluation of teachers' professional competence is of high practical relevance in order to meet the complex demands of the teaching profession. Hence, in this article we aimed to make an empirical contribution to the discussion of teacher professionalization for gifted education. We investigated the student ability level (i.e., gifted vs. average ability) in relation to teachers' beliefs about students' cognitive and non-cognitive characteristics and their motivational orientations (i.e., self-efficacy and enthusiasm) for teaching them. Furthermore, we examined how those beliefs relate to motivational orientations to teach gifted students. Beside these main objectives, this study conducted a cross-country comparison for two convenience samples from Germany and Australia with the aim to test generalizability of the findings in different countries.

We used solid methods to conduct this cross-country study. We applied an experimental vignette design and ensured comparability of finding by establishing (partial) scalar measurement invariance of scales over country and by applying confirmatory data analytic methods. The dependent variables in our models were latent variables. This approach is preferred over traditional analysis of variance with manifest variables, as it takes measurement errors into account (Wang & Wang, 2012). The established (partial) scalar MI has many potential practical applications for the psychometric development of our questionnaire. Hence, we confirmed the equivalence of all measurement and structural parameters of the factor model across all groups. Thus our questionnaire measures the same psychological constructs across vignettes and countries, so that we could generalize belief dimensions and motivational dimensions across Germany and Australia.

7.1 BELIEFS ABOUT THE GIFTED

In summary and in line with expectations, we observed ambivalent teacher beliefs about gifted students in both countries. That is, pre-service teachers from Germany as well as Australia, in which the overall knowledge and experience with the gifted was higher (but still low), rated gifted students in line with the disharmony hypothesis. Besides high intellectual ability, pre-service teachers from both countries incorrectly associated

maladjustment with giftedness. This is in line with past research of teachers' beliefs about gifted students (e.g., Baudson & Preckel, 2013, 2016; Copenhaver & McIntyre, 1992). In fact, empirical findings do not support behavioral difficulty as a characteristic of gifted children (e.g., Neihart et al., 2002).

Regarding the lack of social-emotional ability, there was only descriptive evidence for negative beliefs about the gifted, a finding not in line with our expectation. Past research found gifted students to be seen as self-contained, emotionally unstable and disagreeable (e.g., Baudson & Preckel, 2013; Busse et al., 1986a, 1986b). Moreover, Baudson and Preckel (2016) found gifted students to be seen as less socially oriented than others, which could reflect the assumption of incompetent self-centered emotions. In our study, we focused on interpersonal social-emotional behavior that is seen to be undesirable; i.e., a lack of social skills and being withdrawn, rather than on intrapersonal social-emotional characteristics. Hence, the nonsignificant result can indicate that the negative beliefs about the social-emotional ability of gifted students do not refer to an inadequate social interaction with peers, but rather to a personal emotional disadvantaged disposition likewise found by Baudson and Preckel (2016).

Furthermore, we explored gender differences in pre-service teachers' beliefs about the gifted. We observed stronger ratings for gifted boys that would disadvantage them, as pre-service teachers perceived them as both less intelligent and more maladjusted in comparison to gifted girls. These findings on gender differences in (pre-service) teachers' maladjustment judgements of the gifted are well aligned with those of other studies (Busse et al., 1986a; Endepohls-Ulpe, 2004; Preckel et al., 2015).

We observed country-specific differences between Germany and Australia for gender only. The Australian sample rated maladjustment higher for gifted students and lower for average- ability students than the German sample, whereas the Australian pre-service teachers described the highest ratings for gifted boys and the lowest ratings for average- ability girls. Moreover, apart from a more positive evaluation of social-emotional ability for girls in the Australian sample, the marginal significant three-way interaction between country, ability, and gender suggested that Australian pre-service teachers rated gifted boys as exhibiting the highest lack of social-emotional competencies, while average ability girls displayed the lowest deficit. Overall, results indicate

preliminary but yet speculative evidence for a stronger negative stereotyping of the gifted within Australia.

7.2 MOTIVATIONAL ORIENTATIONS FOR TEACHING GIFTED STUDENTS

To our knowledge, this study was the first that examined (pre-service) teachers' enthusiasm and self-efficacy for teaching a gifted student compared to an average-ability student. Pre-service teachers in both countries indicated lower self-efficacy for teaching a gifted student. When discussing these findings, it is important to keep in mind that teachers' self-efficacy can serve as an indicator for how effective and successful they feel as teachers with students in their class. Moreover, self-efficacy seems to relate to actual classroom behavior (Frenzel et al., 2009; Kunter et al., 2008) and, in general, serves as a reliable predictor for professional behavior and academic as well as professional achievement (e.g., Caprara, Vecchione, Alessandri, Gerbino, & Barbaranelli, 2011; Lent, Brown, & Larkin, 1987; Multon, Brown, & Lent, 1991; Schneider & Preckel, 2017). Hence, the perceived lack of self-efficacy indicates that pre-service teachers believe that they are not well prepared to deal with gifted students. Consequently, this suggests that pre-service teachers do not consider themselves able to provide adequate educational provision for the gifted, and they believe that they do not know how to foster and handle the gifted successfully.

Moreover, in the Australian sample, student gender seemed to bias pre-service teachers' motivational orientations for teaching the gifted. Self-efficacy for teaching a girl was not affected by her ability, while pre-service teachers' self-efficacy in teaching a boy depended on his ability. Besides an overall higher enthusiasm rating in Australia, the enthusiasm for teaching a gifted boy was lowest and highest for a gifted girl. These results may reflect once more a stronger gender stereotyping in Australia than in Germany.

7.3 RELATIONS BETWEEN BELIEFS AND MOTIVATIONAL ORIENTATIONS

Beliefs are strong predictors of behavior (Ajzen & Fishbein, 1980). They activate expectations (e.g., motivational orientations), which lead to behaviors that can facilitate or constrain support of students in class. Results from MGSEM illustrated the importance of enthusiasm and self-efficacy beliefs for teaching gifted students. The model with

beliefs as predictors for motivational orientations was successful in explaining a significant amount of the variability of pre-service teachers' enthusiasm and self-efficacy. Students' ability level was directly related to pre-service teachers' enthusiasm, except when teaching a girl within the Australian sample. Moreover, only for the Australian sample, students' ability level had a significant direct effect on self-efficacy when a boy was described. These findings underline our speculation that there might be more persistent gender stereotyping with favorable attitudes for girls present in Australia.

The effective management of students' undesirable behavior in class is an important but challenging demand for teachers (Kokkinos, Panayiotou, & Davazoglou, 2004). At the same time, coping with students' strenuous behavior can be perceived as stressful (Travers & Cooper, 1996), and therefore it can affect teachers' cognitive and affective motivational orientations; findings of our study point to this direction. Ratings of intellectual ability and maladjustment significantly explained pre-service teachers' motivational orientations. In both countries, pre-service teachers' ratings of a student's intellectual ability had significant positive regression weights, which indicate that pre-service teachers with high ratings of student intellect can be expected to exhibit a higher enthusiasm and higher self-efficacy for teaching this student. Rating of students' maladjustment, in turn, had significant negative regression weights, which suggests that these pre-service teachers with higher ratings of maladjustment possessed a lower enthusiasm and self-efficacy. In summary, pre-service teachers' enthusiasm and self-efficacy decreases by high maladjustment ratings, whereas high intelligence ratings have positive effects. Hence, high ratings of students' intelligence alone did not appear to be detrimental to pre-service teachers' enthusiasm and self-efficacy, but in association with high ratings of students' maladjustment.

As professional teaching is a complex activity that requires a high degree of self-regulation, it is not intrinsically motivating by itself (Lortie, 1975). To conclude, our results demonstrate that teachers' enjoyment of interacting with gifted students and their confidence in teaching them relates to the beliefs they hold toward these students.

7.4 LIMITATIONS

We did not aim to address the causal relationship between students' ability level and teachers' beliefs about students' characteristics and, in turn, their motivational

orientations. The results of this study can be seen as indicators for an association between beliefs and motivational orientations. However, longitudinal studies need to confirm causality and the impact of those variables.

Regarding our cross-country comparison, we found preliminary, but speculative, evidence for a negative gender bias and a stronger gifted stereotyping in the Australian sample. Referring to a discussion on the sources of negative beliefs, Gross (1999) mentioned socio-political attitudes toward gifted education in Australia and argued that intellectual excellence is often seen as elitist. However, neither the aim of this study was to discuss possible explanations of a (stronger) gifted or gender stereotype in Australia, nor did we assume an explicit hypothesis about cultural differences between Germany and Australia. Whether gender bias and strong negative beliefs about the gifted are related or due to Australia's culture, history, or society will need to be investigated in further research.

We used pre-service teacher ratings to assess beliefs and motivational orientations. At the same time, past research has shown that teachers' beliefs about the gifted are fairly constant throughout their career (Baudson & Preckel, 2013; Guskin, Peng, & Simon, 1992; Lee et al., 2004; McCoach & Siegle, 2007; Sahin & Düzen, 1994), which suggest that the findings of pre-service and in-service teachers do not differ largely. However, in order to generalize from current findings on motivational orientations and beliefs of pre-service teachers on the teaching profession at large, one would need to confirm the assumption by assessing an in-service teacher sample.

We assessed experience with the gifted and knowledge about giftedness with one item measures only, which calls into question the validity and reliability of this assessment. In addition, our participants were pre-service teachers who showed little variation in their experiences and knowledge. Future studies could investigate the effects of experience and knowledge on beliefs and motivational orientation by using (1) more comprehensive measures and (2) a sample of in-service teachers with various experiences and knowledge.

Moreover, we assessed perceived enthusiasm for teaching the gifted rather than displayed enthusiasm in a teaching setting. Despite that the assessment of displayed enthusiasm in a teaching setting would cause practical difficulties, the relation between

teachers' beliefs about the gifted and their actual, displayed enthusiasm in classroom still need to be explored.

We hold a preliminary assumption that low motivational orientations for teaching the gifted serve as a predictor for actual behavior in class. However, further research on the question, if and how enthusiasm and self-efficacy beliefs for teaching gifted students is decoded into behavior, is still required. We would expect that teachers, who were highly enthusiastic about teaching the gifted and who perceived high self-efficacy for teaching them also demonstrate more functional behavior, e.g., higher instructional quality (i.e., classroom management, cognitive activation, support; see Kunter et al., 2008). This in turn, can affect student motivation, achievement, and personality development. However, the present study did not have to account to that question. Neither did we examine teachers' actual behavior in the field, nor did we have any student data to connect with teacher variables.

7.5 THEORETICAL AND PRACTICAL IMPLICATIONS

Beliefs identified can relate to expectations that (pre-service) teachers hold toward gifted students and, consequently, to how they behave toward these students. Incorrect beliefs about student characteristics can lead to negative evaluation of the gifted (Preckel et al., 2015) and to an incorrect bias in the identification of gifted students if they show adjustment difficulties at the same time (see Baudson & Preckel, 2016, for in-depth discussion). Furthermore, research has shown that inappropriate reactions in the social environment and school setting toward gifted children are assumed to be a risk factor that might foster maladaptive development (Fiedler, 1999; National Association for Gifted Children, 2009; Vaivre-Douret, 2011). Reflecting on these concerns about teachers' beliefs in line with the disharmony hypothesis, it seems to be obvious that teachers can have an important influence on the educational and personal development of the gifted. Accordingly, the study outcome contributes to a deeper understanding of the structure of beliefs about gifted students' characteristics, which can serve as a component in successful teacher education programs (Rimm, Siegle, & Davis, 2018).

Nevertheless, as previously discussed by Baudson and Preckel (2016), the reasons why teachers hold that belief structure is still not clear. To best of our knowledge, no empirical study has investigated the underlying processes of those ambivalent beliefs so

far. Therefore, further research could explore the mechanism underlying the effects of the disharmony hypothesis. We would like to take account of this aspect in a follow- up study on teachers' personality traits explaining the disharmony hypothesis.

Overall, our findings point to a number of consequences for pre-service teacher education and in-service teacher professional development, especially as our results showed that beliefs about gifted students' characteristics are associated with motivational orientations. Although further research is needed to examine the causal relation between beliefs, motivational orientations, teacher behavior, and student issues (e.g., by linking student and teacher data), we propose that initial teacher education on giftedness should be devoted to both beliefs about gifted students' characteristics and teachers' motivational orientations. Hence, teacher education should aim to improve knowledge of gifted students' characteristics and identification of the gifted, with an intention to foster motivation to engage with the gifted and raise self-efficacy for teaching them.

Inclusion as a current educational objective strengthens the relevance of our findings. Pre-service and in-service teachers need to be prepared to teach students with different intellectual abilities in order to ensure that all students are taught and supported according to their individual needs. Hence, professional teacher competence also needs to include skills and a willingness to deal with the demands of diverse students in a given situation (Weinert, 2001). In the light of a growing heterogeneity in the classroom (see Unesco, 2009 for the demand for inclusive education), our findings on giftedness stress the importance of this topic within teacher education. Fostering the adequate inclusion of gifted students in mixed-ability classes involves the strengthening of teachers' self-efficacy beliefs about teaching the gifted. Thus we recommend that, besides beliefs about the gifted, teacher education programs need to instruct them on how to foster students with diverse intellectual abilities. This knowledge and skills could enhance teachers' self-efficacy for teaching them.

7.6 CONCLUSION

We aimed to make an empirical contribution to the discussion on the professionalization of teachers in gifted education. Beside positive ratings of gifted students' intellect, we have found inaccurate negative beliefs about gifted students' non-cognitive characteristics in relation to teachers' motivational orientations for teaching them. Our

comparison between Germany and Australia strengthened the assumption that those beliefs about gifted students are generalizable over countries. Reflecting on the importance of a teacher's motivational orientation for actual classroom behavior, the association of high intellect and maladjustment with teachers' motivation, we strongly emphasize the need for educational provision on giftedness and gifted education within teacher education courses.

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9. APPENDIX

To ensure that the text was neutral regarding the student's characteristics under study we ran a pilot study. Participants rated the vignette without experimental manipulation (i.e., not naming the ability level of the student; for boys only). The idea was that the vignette by itself should not enable participants to assess students' actual characteristics, as there was not enough information available to do so. If so, then in our main study pre-service teachers' rating on gifted students would reflect their personal beliefs about students' characteristics. We asked participants to rate all belief dimensions, which served as dependent variables in our main study and students' socioeconomic status, which was considered to be associated with belief dimensions. Australian pre-service teachers (N = 26) rated the vignette on a 5-point continuum scale with two divergent poles from 1 to 5. Means with middle distribution (2.0 to 4.0) indicated neutral ratings; i.e., the vignette had no or few information to allow assessment of those characteristics (see Appendix A). German pre-service teachers (N = 44) rated the vignette on a 6-point scale with means around 3 indicating neutral ratings.

Appendix A. Preliminary Rating of Vignette Without Ability Label to Check Neutrality

	Australia (n = 26)		*Germany (n = 44)*	
	M	*SD*	*M*	*SD*
Intellectual ability	4.08	0.74	3.66	0.65
Social-emotional ability	2.58	0.81	2.70	0.85
Maladjustment	3.92	0.74	2.93	0.70
Socio-economic status	3.00	0.40	2.84	0.57

Note. Response format for the Australian sample ranged from 1 (low) to 5 (high); Response format for the German sample ranged from 1 (low) to 6 (high).

Appendix B. Tests for Measurement Invariance of the Scales for the Five Dimensions Across Online (n = 46), and Random Hard-Copy Sample (n = 30) for Australian Male Vignette.

Model	χ^2	*df*	*p*	CFI	Comparison	ΔCFI	$\Delta\chi^2$	Δ*df*	$p(\Delta\chi^2)$
INT									
Configural	11.615	10	.312	.990					
Metric	13.819	14	.463	1.000	2 vs. 1	.001	2.295	4	.682
Part. Scalar	15.802	17	.538	1.000	3 vs. 2	.000	1.558	3	.669
Strict	24.552	22	.319	.985	4 vs. 3	.015	8.465	5	.132
SOE									
Configural	3.049	4	.550	1.000					
Metric	4.662	7	.701	1.000	2 vs. 1.	.000	1.472	3	.689
Scalar	7.002	10	.725	1.000	3 vs. 2	.000	2.375	3	.498
Strict	13.049	14	.526	1.000	4 vs. 3	.000	5.643	4	.228
MAL									
Configural	1.115	4	.892	1.000					
Metric	7.048	7	.424	.999	2 vs. 1	.001	5.535	3	.137
Part. Scalar	6.191	8	.626	1.000	3 vs. 2	.001	1.967	1	.161
Strict	23.111	12	.027	.832	4 vs. 3	.168	18.918	4	.001
ENT									
Configural	1.932	4	.748	1.000					
Metric	8.082	7	.325	.993	2 vs. 1	.007	6.520	3	.089
Scalar	9.886	10	.451	1.000	3 vs. 2	.007	1.705	3	.636
Strict	14.681	14	.400	.995	4 vs. 3	.005	6.480	7	.485
SEL									
Configural	20.315	4	.000	.924					
Metric	26.196	7	.000	.911	2 vs. 1	.013	6.704	3	.082
Scalar	29.754	10	.000	.908	3 vs. 2	.003	10.311	3	.333
Strict	31.815	14	.004	.917	4 vs. 3	.009	3.340	4	.503

Note. N = 92. *df* = degrees of freedom; CFI = comparative fit index. INT = intellectual ability; SOE = lack of social-emotional ability; MAL = maladjustment; ENT = enthusiasm for teaching the student; SEL = self-efficacy for teaching the student.

Appendix C. Tests for Measurement Invariance of the Scales with MGCFA (Eight Groups) for the Five Dimensions With Satorra-Bentler Correction in χ^2-Difference Testing for MLR Estimator (N = 690).

Model	χ^2	*df*	*p*	CFI	Comparison	ΔCFI	$\Delta\chi^2$	Δ*df*	$p(\Delta\chi^2)$
INT									
Configural	41.443	40	.408	.998					
Metric	68.326	68	.466	1.000	2 vs. 1	.002	27.027	28	.517
Part. Scalar	100.383	92	.258	.990	3 vs. 2	.010	33.590	24	.092
Strict	149.028	120	.037	.966	4 vs. 3	.024	43.012	28	.035
SOE									
Configural	15.058	16	.520	1.000					
Metric	37.066	37	.466	1.000	2 vs. 1	.000	21.927	21	.404
Part. Scalar	60.879	55	.273	.988	3 vs. 2	.012	24.432	18	.141
Strict	93.086	83	.211	.980	4 vs. 3	.008	32.093	28	.271
MAL									
Configural	17.144	16	.376	.997					
Metric	42.719	37	.239	.986	2 vs. 1	.011	25.587	21	.223
Part. Scalar	63.023	52	.141	.972	3 vs. 2	.014	20.370	15	.158
Strict	146.404	80	.000	.832	4 vs. 3	.140	81.196	28	.000
ENT									
Configural	10.632	16	.832	1.000					
Metric	34.917	37	.567	1.000	2 vs. 1	.000	25.371	21	.231
Part. Scalar	60.342	56	.322	.994	3 vs. 2	.006	26.027	19	.129
Strict	104.076	84	.068	.973	4 vs. 3	.021	40.273	28	.063
SEL									
Configural	19.555	16	.241	.994					
Metric	48.564	37	.097	.980	2 vs. 1	.014	29.428	21	.104
Part. Scalar	68.216	51	.054	.971	3 vs. 2	.009	19.931	14	.132
Strict	130.760	79	.000	.911	4 vs. 3	.060	57.600	28	.001

Note. df = degrees of freedom; CFI = comparative fit index; INT = intellectual ability; SOE = lack of social-emotional ability; MAL = maladjustment; ENT = enthusiasm for teaching the student; SEL = self-efficacy for teaching the student.

CHAPTER IV

GIFTEDNESS AS A MATTER OF JUSTICE? THE RELATION BETWEEN PRESERVICE TEACHERS' BELIEFS ABOUT THE GIFTED AND THEIR BELIEF IN A JUST WORLD

ARTICLE 3:

GIFTEDNESS AS A MATTER OF JUSTICE?

THE RELATION BETWEEN PRESERVICE TEACHERS' BELIEFS ABOUT THE GIFTED AND THEIR BELIEF IN A JUST WORLD

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Background. Beliefs can influence teachers' perceptions of and behavior toward students, thus shaping students' learning opportunities. When teachers rely on the disharmony stereotype, they ascribe deficits in social-emotional abilities or maladjustment to gifted students. Such stereotypical beliefs have been found to be negatively related to teachers' motivational orientations to teach gifted students. However, the psychological processes that underlie such beliefs are still unknown. Justice motive theory provides a possible explanation for negative stereotypical beliefs about giftedness.

Aims. The main goal of this study was to investigate whether the belief in a just world leads to the attribution of negative noncognitive characteristics to the gifted in order to make up for their intellectual privilege.

Sample. The sample comprised 527 preservice teachers from 11 university colleges in Belgium.

Methods. In an experimental vignette design, preservice teachers rated the characteristics of a gifted or an average-ability student and indicated their general belief in a just world.

Results. Preservice teachers erroneously associated giftedness with maladjustment. In line with justice motive theory, preservice teachers' belief in a just world moderated their endorsement of maladjustment as a characteristic of

giftedness: Preservice teachers with a strong belief in a just world rated gifted students as more maladjusted. For those low in the just world belief, giftedness was unrelated to maladjustment.

Conclusion. Findings suggest that the justice motive plays a central role in preservice teachers' beliefs about gifted students. Teacher education may help preservice teachers rethink their beliefs and overcome incorrect stereotypes about the gifted.

Keywords: Teacher beliefs; stereotypes; giftedness; belief in a just world; justice; teacher education

GIFTEDNESS AS A MATTER OF JUSTICE?

THE RELATION BETWEEN PRESERVICE TEACHERS' BELIEFS ABOUT THE GIFTED AND THEIR BELIEF IN A JUST WORLD

In previous research on teachers' beliefs about giftedness, teachers held ambivalent beliefs about gifted students' characteristics: They associated giftedness with high intellectual ability but also with deficits in noncognitive domains (e.g., Baudson & Preckel, 2013; Carrington & Bailey, 2000). Whereas high abilities are at the core of the giftedness construct, empirical studies have not supported the idea that gifted students show noncognitive deficits (Francis, Hawes & Abbott, 2016; Neihart, Reis, Robinson, & Moon, 2002; Reis & Renzulli, 2004; Zeidner & Shani-Zinovich, 2011). Despite the large body of research on such ambivalent beliefs (Carrington & Bailey, 2000; Lassig, 2009; Preckel, Baudson, Krolak-Schwerdt, & Glock, 2015), very few studies have hypothesized where such ambivalent beliefs about gifted students' characteristics come from. The important question is why teachers rely on giftedness in evaluating other noncognitive characteristics. Lerner's (1965, 1980) just world theory, according to which people need to believe that the world is a just place, offers one possible explanation. Gifted students' advantage in intellectual abilities might threaten a teacher's educational goal to be fair and to treat every student equally, may thereby inducing a moment of injustice that might be cognitively restored by de-evaluating other noncognitive characteristics of the gifted. In this study, we aimed to explore whether giftedness is a matter of justice. Can teachers' negative assumptions about gifted students' noncognitive characteristics be attributed to teachers' beliefs that the world is a just place so that they can re-establish subjective fairness? On the basis of Lerner's (1965, 1980) just world theory, we proposed that such ambivalent beliefs may partly reflect a person's belief in a just world.

1. BELIEFS ABOUT GIFTED STUDENTS

Teachers' beliefs are part of their professional competence (Kunter et al., 2013) and include stereotypical views about students' characteristics. Stereotypes consist of simplified assumptions about objects, ideas, or social categories, for example, as defined

by gender, religion, ethnicity, or other defining characteristics such as giftedness. Stereotypes simplify information processing and contribute to decisions and behavior in situations where actors have little motivation or capacity to process a lot of information in depth. Accordingly, teachers' stereotypical views about their students can influence teachers' behavior in class (Pajares, 1992).

Teachers sometimes hold incorrect beliefs about gifted students. A common but incorrect belief is reflected by the *disharmony stereotype* (Becker, 1978; Gallagher, 1990; Neihart, 1999). Teachers who embrace this stereotype assume that gifted students are bright but lack social and emotional skills or even suffer from maladjustment. In two studies, Baudson and Preckel (2013, 2016) found evidence consistent with the disharmony stereotype, showing that German preservice and in-service teachers held ambivalent beliefs about gifted students (attributing high intellectual abilities but low social skills and adjustment to them). Preckel et al. (2015) reported comparable findings for implicit measures (i.e., the implicit association test and affective priming tasks). The disharmony stereotype is similarly prevalent among preservice and in-service teachers and seems to be almost unrelated to teachers' length of professional experience (Baudson & Preckel, 2013; McCoach & Siegle, 2007). Importantly, stereotypical beliefs about the gifted carry practical implications for teaching. For example, Matheis et al. (2018) found that teachers' beliefs play an important role in determining how motivated they are to engage with gifted students (Matheis, Kronborg, Schmitt, & Preckel, 2018). The more teachers believed that giftedness is associated with maladjustment, the less motivated they were to teach these students. Moreover, Matheis, Kronborg, et al. (2018) showed that ambivalence in teachers' beliefs about gifted students' characteristics holds across countries because preservice teachers from Germany and Australia associated giftedness with high achievement and intellectual abilities but also (incorrectly) with maladjustment.

Despite considerable evidence supporting the presence of the disharmony stereotype (e.g., Carrington & Bailey, 2000; Lassig, 2009; Lee, Cramond, & Lee, 2004; Preckel et al., 2015), very little research has been conducted on the origins of these stereotypical beliefs about the gifted.

2. THE BELIEF IN A JUST WORLD

One promising approach for explaining stereotypes about groups in general and about gifted students in particular draws on Lerner's (1965, 1980) justice motive theory (Ellard, Harvey, & Callan, 2016). According to Lerner, people have a need to believe that the world is a just place where individuals get what they deserve and deserve what they get. The belief in a just world (BJW) is a manifestation of the need for justice (Hafer & Sutton, 2016). It can be viewed as a basic conceptual system consisting of assumptions about the benevolence of the world that determine people's fortunes and misfortunes (Janoff-Bulman, 1989). The BJW is functional. It stabilizes well-being because it enables people to view their lives as meaningful, predictable, and controllable (Correia & Vala, 2004; Dalbert, 2001; Dalbert & Dzuka, 2004; Lerner 1980). In line with these general principles, research on the teaching profession has found that teachers' BJW is functional for their personal well-being (Dzuka & Dalbert, 2007).

Many studies have shown that the BJW is a relatively stable disposition that varies in strength between individuals (Rubin & Peplau, 1973, 1975). People are motivated to maintain and protect their BJW in the face of discrepant information (Hafer & Sutton, 2016). That is, the confrontation with experienced or observed injustice threatens the BJW, and thus, people are motivated to restore justice, either with action or cognitively. Whenever possible and because it is not too costly, people generally prefer to protect justice or to actively restore it (Hafer & Bègue, 2005; Lerner & Simmons, 1966). Some kinds of inequity cannot be turned into equity. As an example, consider a person who was born with a severe handicap that cannot be treated and whose negative consequences cannot be fully compensated. In these kinds of situations, observers tend to protect their BJW cognitively. This can take place in multiple ways (Montada & Lerner, 1998), for example, by believing that a person's fate is at least partly self-inflicted (e.g., Bulman & Wortman, 1977; Lupfer, Doan, & Houston, 1998), or by minimizing the injustice itself (Lipkus & Siegler, 1993). Research in several areas has found that the BJW explained justice judgments about disadvantaged or stereotyped groups as well as cognitive (stereotyping) or emotional reactions (Maes & Schmitt, 2004). Studies have looked at BJW correlates of victims of misfortune such as poverty (Appelbaum, Lennon, & Lawrence, 2006) or rape (Strömwall, Alfredsson, & Landström, 2013), attitudes toward people with disabilities (Furnham, 1995), and reactions to women in the work force

(Dalbert, Fisch, & Montada, 1992), the unemployed (Montada, Schneider, & Reichle, 1988), immigrant workers, and people from developing countries (Montada, Schmitt, & Dalbert, 1986). Most of this research has looked at how observers cope with victimization. However, injustice can always be conceptualized as some sort of inequality or inequity. Every disadvantageous inequity is mirrored by advantageous inequity (Walster, Walster, & Berscheid, 1978; Montada et al., 1986). The (in)justice can result from economic privileges but also from privileges granted by nature.

Physical attractiveness and intelligence are prominent examples for privileges granted by nature. Ample research has shown that physical attractiveness and intelligence are social capital components that affect desirable outcomes such as income and other kinds of life success (Gottfredson, 1997; Hamermesh, 2011). Research on the "beautiful is good" stereotype (Dion, Berscheid, & Walster, 1972) found that BJW is related to positive evaluations of attractive people's characteristics in general (Dion & Dion, 1987). That is, people high in BJW tend to justify observed benefits of attraction by ascribing them to other desirable characteristics, too.

In contrast to the abovementioned process of justifying privileges, another way to cope with injustice is to neutralize privileges by burdening an unfairly privileged target with negative outcomes. These outcomes can be material or symbolic (Schmitt et al., 1991). A typical example of a symbolic neutralization of privileges is the "rich but miserable" stereotype (e.g., Kay & Jost, 2003).

This symbolic neutralization of unfair privileges might also occur with respect to stereotypical beliefs about gifted students. Observers such as teachers or peers with a strong need for fairness and justice and, accordingly, a strong BJW might view the intellectual superiority of gifted students as a threat to their need for justice (Gallagher, 1990) and employ the ascription of negatively valued characteristics to satisfy their justice need and defend their BJW (Baudson, 2011; Baudson & Preckel, 2016). In other words, the disharmony stereotype might serve to protect the BJW. If this is true, agreement with the disharmony stereotype should depend on the BJW. To the best of our knowledge, this idea has never been tested empirically. We aimed to do so with the present study.

3. THE PRESENT STUDY

To test the hypothesis that the disharmony stereotype serves to protect the BJW (Baudson, 2011; Baudson & Preckel, 2016; Gallagher, 1990), we conducted a between-subjects experimental vignette study in which preservice teachers (a) judged the characteristics of a stimulus student previously determined to be either a gifted girl/boy or an average-ability girl/boy and (b) completed a BJW scale (Dalbert, Montada, & Schmitt, 1987).

On the basis of previous research on teachers' beliefs about the gifted (Bain, Choate, & Bliss, 2006; Baudson & Preckel, 2013, 2016; Carrington and Bailey, 2000; Geake & Gross, 2008; Matheis, Keller, Kronborg, Schmitt, & Preckel, 2018; Matheis, Kronborg, et al., 2018; Lassig, 2009), we expected that giftedness would instigate the ascription of ambivalent characteristics in line with the disharmony stereotype and that the size of this effect would depend on the BJW. Accordingly, we predicted a main effect of giftedness such that gifted students would be ascribed higher intellectual ability but also lower social-emotional abilities and higher maladjustment in comparison with average-ability students. Moreover and of crucial importance, we predicted that this neutralization effect (i.e., ascribing lower social-emotional abilities and higher maladjustment) would be moderated by teachers' BJW. That is, we expected that BJW would specifically affect ratings of students' noncognitive characteristics but not ratings of intellectual ability.

To test the generalizability of the findings across gender, we investigated the predicted effects for (gifted and average-ability) girls and boys.

Of note, we tested the hypotheses in a sample of preservice teachers (i.e., student teachers). However, beliefs about gifted students have been found to be similar for in-service and preservice teachers (Baudson & Preckel, 2013; Lee et al., 2004; McCoach & Siegle, 2007).

4. METHOD

4.1 DESIGN

We used an experimental between-subjects design and provided participants with a vignette from previous studies (Baudson & Preckel, 2013, 2016; Matheis, Keller, et al., 2018; Matheis, Kronborg, et al., 2018). The vignette was a brief description of a fictitious student in an everyday school situation (see Figure 1). We varied the information about the student's giftedness with two experimental conditions (gifted vs. average-ability). Moreover, we varied the information about the student's gender (a girl named Karen vs. a boy named Michael). That is, we had four versions of the vignette (average-ability boy, gifted boy, average-ability girl, gifted girl). The vignette contained no further information about the student's characteristics. The reasoning behind this lack of information was that it would force teachers to rely on their subjective beliefs when making judgments about a student's characteristics. When asking people about stereotypical beliefs, social desirability often plays an important role. Thus, we assessed social desirability and controlled for response bias in ratings.

> Michael is a student at the school where you have been teaching for one year. Michael is twelve years old and gifted. Mr. Smith, the teacher who was supposed to teach the last period of the day, has called in sick. You take over this lesson and allow the children to do homework or keep themselves busy independently. Michael flicks through an atlas and then walks towards a big world map mounted on the classroom wall. Two other children are already standing in front of the map, giggling. Michael asks the two of them: "Do you know which continent has the most people?" One of the children replies: "Why would you want to know that?" The other child walks back to his seat. Michael replies: "Well, never mind. Doesn't matter." After a while, Michael walks up to you and asks: "When will Mr. Smith be back?"

Figure 1. Sample vignette with the student described as male and gifted.

4.2 PARTICIPANTS AND PROCEDURE

We assessed $N = 527$ Dutch-speaking preservice teachers from 11 university colleges in Belgium. Participants were recruited from Bachelor of Education courses during lectures for voluntary participation. Data were collected online with a link to an online platform. Participants were told that the purpose of the study was to examine the mechanisms underlying impression formation on the basis of minimal information. We randomly assigned participants to our experimental conditions (i.e., vignette versions). That is, participants read about a student identified as either gifted or average. After reading the vignette, participants completed a questionnaire for assessing students' characteristics in

light of the disharmony stereotype (Matheis, Keller, et al., 2018; Matheis, Kronborg, et al., 2018). Subsequently, BJW, social desirability, and demographic variables (i.e., gender, age, self-rated knowledge about and experience with gifted students) were assessed. The average processing time for the whole online study[6] was *M* = 12.16 min (Min = 5.71, Max = 18.8), and *M* = 4.80 min, *SD* = 1.35 (Min = 1.87, Max = 11.92) for the assessment part of the protocol. We deleted *n* = 75 participants who took less than 1 *SD* under the average processing time to answer the scales (i.e., participants who spent less than 3.45 min answering the items). We speculated that these participants did not participate faithfully. The remaining *N* = 452 participants (155 men and 297 women) were included in our analyses. Their mean age was *M* = 21.66 years (*SD* = 3.36).

4.2.1 PRELIMINARY STEPS

Using the back-translation method (Brislin, 1986), we ensured accuracy of the translation for the materials: First, the English materials were translated into Dutch. Second, the translation was crosschecked, and an native Dutch and English speaker proofread it to account for correct English. Third, the martial was translated back into English.

4.3 MEASURES

4.3.1 QUESTIONNAIRE TO ASSESS BELIEFS ABOUT GIFTEDNESS

To measure beliefs about the gifted, we used a questionnaire from previous research (Matheis, Keller, et al., 2018; Matheis, Kronborg, et al., 2018). Using a 6-point Likert scale from 1 = *strongly disagree* to 6 = *strongly agree*, participants were asked to rate students' intellectual ability (five items: "This child is smart"; "…obtains good grades"; "…is clever"; "…is intelligent"; "…is competent"), lack of social and emotional ability (four items: "This child lacks social skills"; "…is withdrawn"; "I rate the child's social-emotional ability rather negatively"; "I rate the child's social-emotional ability rather positively" [inverted item]), and maladjustment (four items: "Teaching this child is

[6] With this online study, we also assessed teachers' motivation to teach students, their ratings of students' personality, teachers' self-perceptions (e.g., academic self-concept), and their subjective theories of intelligence.

strenuous"; "This child is intolerant"; "This child considers himself/herself superior to everyone else"; "This child displays behavioral problems"). Table 1 shows reliabilities (McDonald's Omega; Brunner, Nagy, & Wilhelm, 2012).

4.3.2 BELIEF IN A JUST WORLD

We assessed BJW with the General Belief in a Just World Scale (GBJW; Author, 1987). Participants rated the six items on a 6-point Likert scale from 1 = *strongly disagree* to 6 = *strongly agree* (see Table 1 for reliabilities). The items are: "I firmly believe that injustices in all areas of life (e.g., professional, family, politics) are the exception rather than the rule"; "I believe that, by and large, people get what they deserve"; "I am confident that justice always prevails over injustice"; "I am convinced that in the long run people will be compensated for injustices"; "I think basically the world is a just place"; "I think people try to be fair when making important decisions."

4.3.3 SOCIAL DESIRABILITY SCALE

We used four items from the Marlowe-Crowne Social Desirability Scale (Crowne & Marlowe, 1960; Fischer & Fick, 1993). Items were "I sometimes try to get even rather than to forgive and forget"; "There have been some occasions when I took advantage of someone"; "I like to gossip at times"; "I am always willing to admit when I made a mistake." The items were answered on a 6-point Likert scale (1 = *strongly disagree* to 6 = *strongly agree*).

4.3.4 DEMOGRAPHICS

Participants were asked to indicate their gender and age. Moreover, participants indicated their level of experience with gifted students (single item) as well as knowledge on the subject of giftedness (single item) on a 5-point Likert-scale (1 = none to 5 = a lot).

4.4 DATA ANALYSES

4.4.1 PRELIMINARY ANALYSIS

Testing for measurement invariance. To draw valid comparisons, the scales must measure the same constructs in all four vignette versions. To ensure that this was the case, we tested for measurement invariance (MI) using Mplus 7.4 (Muthén & Muthén, 1998–2015). To do so, we applied multigroup confirmatory factor analyses (MGCFA) across the vignette versions in four separate analyses; that is, we ran separate analyses for each scale to assess the disharmony stereotype (intellectual ability, lack of social-emotional ability, maladjustment) and the GBJW scale. Testing for MI means comparing measurement models that are increasingly restrictive (configural, metric, scalar MI; Steenkamp & Baumgartner, 1998). The comparison of factor means across vignette versions requires at least scalar MI, which can be accepted if there are only small changes in the comparative fit index (CFI) compared with the model specifying metric MI (ΔCFI $\leq$ .01; Chen, 2007). Moreover, valid comparisons can also be made if partial scalar invariance is found (Steenkamp & Baumgartner, 1998). After establishing MI across the vignette versions, we used the resulting factor scores for each of the scales separately, assuming the appropriate invariance. Therefore, we derived factor scores for each of the scales from MGCFA across vignette versions. MGCFA does not estimate absolute factor means for each group but rather computes differences in factor means between one reference group (here, average-ability boy) and the remaining vignette versions.

4.4.2 REGRESSION ANALYSES

We used moderated regression analyses to test whether students' giftedness predicted teachers' ratings of students' intellectual ability, social-emotional ability, and maladjustment, and to test whether the effects of giftedness on students' noncognitive characteristics were moderated by BJW. To test the specificity of the expected moderator effect, we also tested the moderator effect for teachers' ratings of students' intellectual ability. We controlled for social desirability by including it as a covariate. We conducted the analyses with IBM SPSS Statistics (Version 25) by using the SPSS plug-in PROCESS (Hayes, 2017), Model Number 3 for moderated moderation testing. In this model, two-

way and three-way interactions are possible such that the predictor and both moderators can interact with each other.

5. RESULTS

5.1 MEASUREMENT INVARIANCE

(Partial) scalar measurement invariance held for the three scales that assessed the disharmony stereotype and the GBJW scale, so that the comparison of partially scalar measurement invariant factor scores across the four vignette versions (average-ability boy, gifted boy, average-ability girl, gifted girl) was feasible (ΔCFI $\leq$ .01, see Appendix A). Table 1 presents the means and standard deviations of factor scores assuming (partial) scalar measurement invariance and reliabilities.

Table 1. Reliabilities (McDonald's Omega), means, and standard deviations of factor scores for preservice teachers' ratings of students and of teachers' belief in a just world.

		INT			SOE			MAL			BJW		
Vignette	*n*	ω	*M*	*SD*	ω	*M*	*SD*	ω	*M*	*SD*	*ω*	*M*	*SD*
Giftedness													
Gifted	205		0.38	0.58		–0.07	0.44		0.16	0.31		–0.02	0.65
Average-ability	247		–0.01	0.48		–0.06	0.50		0.02	0.32		0.02	0.63
Gender													
Girl	232		0.14	0.57		–0.09	0.47		0.11	0.32		0.03	0.57
Boy	220		0.19	0.56		–0.05	0.49		0.47	0.32		–0.03	0.71
Giftedness × Gender													
Average-ability boy	113	.71	0.00	0.41	.72	0.00	0.47	.59	0.00	0.32	.67	0.00	0.68
Gifted boy	107	.79	0.39	0.62	.69	–0.09	0.49	.60	0.10	0.32	.69	–0.06	0.74
Average-ability girl	134	.76	–0.02	0.54	.74	–0.11	0.52	.59	0.04	0.32	.61	0.04	0.58
Gifted girl	98	.78	0.36	0.55	.62	–0.06	0.37	.53	0.22	0.28	.59	0.00	0.55

Note. N = 452. Reference group: average-ability boy fixed to zero. ω = McDonald's Omega. INT = intellectual ability; SOE = lack of social-emotional ability; MAL = maladjustment.

5.2 DESCRIPTIVE STATISTICS

Participants reported little experience with gifted students (M = 2.08, SD = 0.72) and little knowledge on the topic of giftedness (M = 2.45, SD = 0.70). Table 2 presents the correlations between the variables included in the regression analyses. Because social desirability was significantly correlated with lack of social-emotional ability, maladjustment, and BJW, it was included as a covariate in subsequent analyses.

Table 2. Correlations between the factor scores (assuming partial scalar measurement invariance) of preservice teacher ratings and predictor (1), moderator (2 and 3), and control (4) variables.

	INT	SOE	MAL	1	2	3	4
Teacher rating							
Intellectual ability	—	–.11*	.00	.35***	.04	.01	.01
Social-emotional deficits		—	.37***	–.02	.05	–.01	–.10*
Maladjustment			—	.21***	–.11*	.09*	–.11*
Variable							
1 Giftedness (0 = average-ability, 1 = gifted)				—	.06	–.04	.03
2 Gender (0 = girl, 1 = boy)					—	–.05	.01
3 BJW						—	.11*
4 Social desirability							—

Note. N = 452. INT = intellectual ability; SOE = lack of social-emotional ability; MAL = maladjustment; BJW = belief in a just world.
*p <.05. **p <.01. ***p < .001.

5.3 BELIEFS ABOUT THE GIFTED AND THE MODERATING EFFECT OF BJW

To test the hypothesis that teachers hold stereotypical views about the gifted and that the extent of stereotyping is a function of teachers' BJW, we conducted moderated regression analyses with preservice teachers' rating of students' intellectual ability, lack of social-emotional ability, and maladjustment as dependent variables (see Table 3). We controlled for socially desirable responding in the regression analyses. Including social desirability did not change the direction of effects or their significance. The predictors accounted for a significant amount of variance in teachers' ratings of students' intellectual ability, F(8, 443) = 8.17, p < .001, R^2 = .12, and students' maladjustment, F(8, 443) = 6.65, p < .001, R^2 = .11, but not students' lack of social-emotional ability, F(8, 443) = 1.17, p = .32, R^2 = .02.

Regarding preservice teachers' ratings of students' intellectual ability, giftedness was a significant predictor, $b = 0.39$, $t(443) = 7.44$, $p < .001$. As expected, the interaction between giftedness and BJW was not significant, implying that the effect of giftedness was not moderated by BJW, $b = –0.04$, $t(443) = –0.42$, $p = .68$. No other predictors or interactions were significant.

Regarding preservice teachers' ratings of students' lack of social-emotional ability, neither giftedness, $b = –0.02$, $t(443) = –0.36$, $p = .72$, nor teachers' BJW, $b = 0.01$, $t(443) = 0.33$, $p = .74$, was significant.

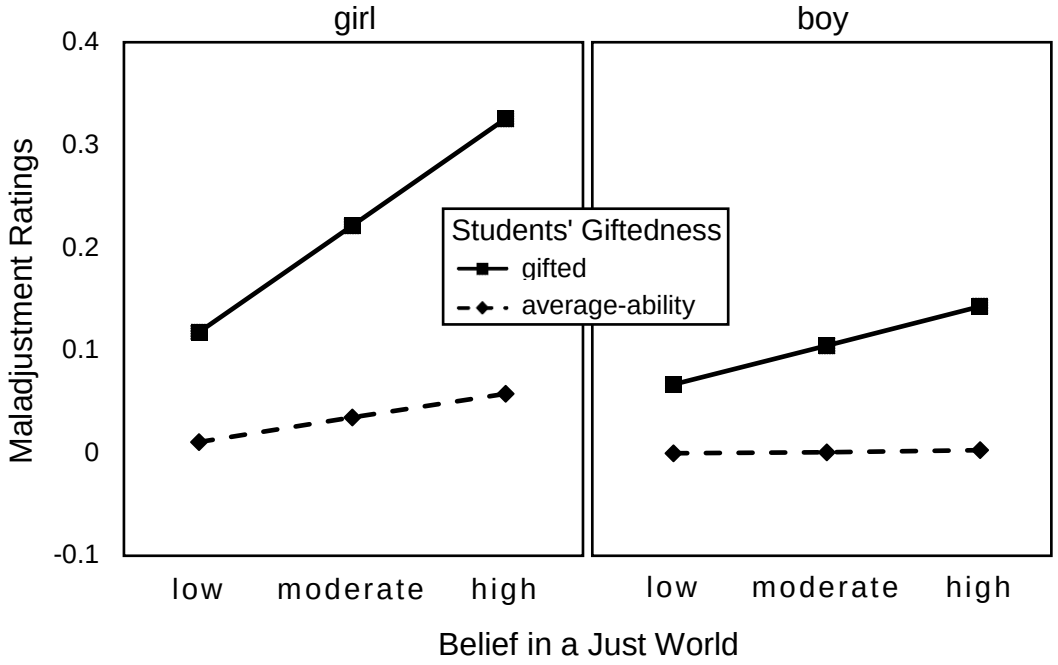

Figure 2. Conditional effects of giftedness on maladjustment ratings at values of teachers' just world belief (latent factor scores with average-ability boy fixed to zero), separate for female and male students.

Regarding preservice teachers' ratings of students' maladjustment, both giftedness, $b = 0.15$, $t(443) = 5.11$, $p < .001$, BJW, $b = 0.06$, $t(443) = 2.69$, $p = .007$, and gender, $b = –0.07$, $t(443) = –2.53$, $p = .01$, were significant predictors. The interaction between giftedness and BJW was significant, $b = 0.10$, $t(443) = 1.98$, $p = .04$, implying that the effect of giftedness depended on preservice teachers' level of BJW. Conditional effects of giftedness on maladjustment were tested for low (1 *SD* below the mean), moderate (mean), and high (1 *SD* above the mean) levels of BJW. As displayed in

Figure 2, giftedness was significantly related to maladjustment ratings for girls and boys when preservice teachers' BJW was moderate: girl: $b = 0.19$, $t(443) = 4.87$, $p < .001$; boy: $b = 0.10$, $t(443) = 2.42$, $p = .01$; or high: girl: $b = 0.27$, $t(443) = 4.28$, $p < .001$; boy: $b = 0.14$, $t(443) = 2.40$, $p = .01$; but not when preservice teachers' BJW was low: girl: $b = 0.08$, $t(443) = 1.48$, $p = .49$; boy: $b = 0.06$, $t(443) = 1.24$, $p = .22$. No other predictors or other interactions were significant (see Table 3).

Table 3. Regression analysis summary for variables predicting preservice teachers' rating of students' intellectual ability, lack of social-emotional ability, and maladjustment while controlling for socially desirable responding.

	Intellectual ability					Lack of social-emotional ability					Maladjustment				
Variable	*b*	*SE b*	*t*	*p*	95 % CI	*b*	*SE b*	*t*	*p*	95 % CI	*b*	*SE b*	*t*	*p*	95 % CI
BJW (centered)	0.03	0.05	0.57	.57	[–0.07, 0.12]	0.01	0.04	0.33	.74	[–0.06, 0.09]	0.06	0.02	2.69	.01	[0.02, 0.11]
Giftedness	0.39	0.05	7.44	<.001	[0.29, 0.49]	–0.02	0.05	–0.36	.72	[–0.10, 0.07]	0.15	0.03	5.11	<.001	[0.09, 0.20]
BJW × Giftedness	–0.04	0.10	–0.42	.68	[–0.23, 0.15]	–0.03	0.07	–0.38	.71	[–0.17, 0.12]	0.10	0.05	1.98	.04	[0.00, 0.18]
Gender	0.03	0.05	0.49	.63	[–0.08, 0.13]	0.05	0.05	1.01	.31	[–0.04, 0.14]	–0.07	0.03	–2.53	.01	[–0.13,–0.02]
Giftedness × Gender	0.01	0.10	0.04	.97	[–0.20, 0.21]	–0.15	0.09	–1.68	.09	[–0.33, 0.03]	–0.08	0.06	–1.46	.15	[–0.20, 0.03]
BJW × Gender	–0.03	0.09	–0.29	.77	[–0.21, 0.16]	–0.09	0.07	–1.15	.25	[–0.23, 0.06]	–0.07	0.05	–1.43	.15	[–0.16, 0.03]
Giftedness × BJW × Gender	–0.15	0.19	–0.80	.42	[–0.53, 0.22]	0.01	0.15	0.05	.96	[–0.28, 0.30]	–0.07	0.09	–0.75	.45	[–0.25, 0.11]
Social Desirability	0.00	0.04	–0.01	.96	[–0.08, 0.08]	–0.07	0.03	–2.21	.03	[–0.13,–0.01]	–0.05	0.20	–2.61	.01	[–0.09, 0.01]

Note. $N = 452$. BJW = belief in a just world; CI = confidence interval for *b*.

6. DISCUSSION

In this study, we investigated whether preservice teachers' beliefs about gifted students comprise an ambivalent view in line with the disharmony stereotype and whether negative beliefs about noncognitive characteristics depend on preservice teachers' belief in a just world (BJW). We specifically expected that the neutralization effect (i.e., ascribing a greater lack of social-emotional abilities or higher maladjustment to gifted students) would be stronger when pre-service teachers showed higher BJW. We assessed preservice teachers' beliefs about gifted students' characteristics with an experimental vignette design and tested whether their beliefs about gifted students' social-emotional abilities and adjustment were moderated by BJW.

Our results largely confirmed our expectations. Preservice teachers held a disharmony stereotype: They perceived gifted students as more intelligent but also as less well-adjusted than average-ability students. Teachers' perceptions of social-emotional abilities did not differ by students' ability level. Furthermore, and in line with the "compliant girl" gender stereotype (Jones & Myhill, 2004), girls were perceived as better adjusted than boys. These findings from a sample of Belgian preservice teachers are in line with results from previous studies using the same design and measurement in other countries (i.e., Germany, Australia; Matheis, Keller, et al., 2018; Matheis, Kronborg, et al., 2018). Our second aim was to investigate a possible explanation for the disharmony stereotype, which was derived from justice motive theory. Giftedness may be perceived as an unfair privilege. Because this unfairness cannot be stopped via action, the BJW has to be defended cognitively. This can be achieved by neutralizing the unfair privilege by ascribing negatively valued attributes. Our results supported this reasoning. Preservice teachers' BJW explained this neutralization effect. Specifically, BJW moderated the effect of giftedness on the degree of maladjustment that was attributed to a student. This effect was stronger among participants who had a moderate or high BJW than among those with a low BJW. This relationship remained significant even after we controlled for teachers' socially desirable responding. As expected, BJW functioned specifically as a neutralization effect of gifted students' noncognitive abilities but not for their ratings of intellectual ability. Presumably, the fact that some students have significantly higher intellectual abilities than others implies a threat to believing that the world is just. Because

this belief indicates a justice need, this threat has to be coped with. Our study shows that neutralizing high intellectual abilities with the attribution of maladjustment helps people cope with the potential threat that giftedness poses to their BJW. This coping mechanism seems to share many similarities with the one involved in the "rich but miserable" stereotype (e.g., Kay & Jost, 2003).

One might now ask whether people with a strong need for justice and BJW show a stereotyping tendency in general. Our findings clearly indicate that stereotyping becomes relevant only in the face of gifted students. That is, BJW had no effect on preservice teachers' ratings of average-ability students' characteristics in general. Accordingly, stereotyping does not seem to be a general tendency involved in the BJW but rather a specific defense mechanism employed for coping with inequity.

How are the processes we identified in our study shaped by a student's gender? Despite the nonsignificant interactions between giftedness, gender, and BJW, our data suggest that students' gender may play a role. The descriptive pattern displayed in Figure 2 suggests that the defensive disharmony stereotyping effect may be stronger for girls than for boys. This tendency may reflect gender stereotypes. The "compliant girl" stereotype states that girls are well-behaved and have higher social-emotional skills than boys (Jones & Myhill, 2004). When combined with high intellectual abilities, these positively valued attributes of girls may amplify perceived injustice. If this is true, the threat to the BJW will also be amplified, and so will, in turn, the need to cope with this injustice via the neutralization process involved in the disharmony stereotype. Future research should test this tentative reasoning directly and with the degree of statistical power that is needed to confirm the small effect we extracted descriptively from our data.

6.1 LIMITATIONS AND FUTURE DIRECTIONS

The endorsement of stereotypical beliefs about giftedness might vary not only with the BJW but also with other characteristics such as the perceiver's own ability. Gifted students might threaten not only the BJW but also teachers' ability self-concept or self-esteem (if intellectual ability is important for their self-esteem). Moreover, perceiving similarities and differences from the teachers' perspective between themselves and students can influence social categorization processes, which in turn can shape interpersonal behavior and thus teaching. Therefore, further studies could investigate the

impact of teachers' ability self-perceptions. Their own intellectual ability is a dimension of potential equality between students and themselves. Teachers who perceive themselves as more able might be more likely to locate gifted students within the boundaries of their own social world. Shared membership in the same in-group would reduce the potential threat to teachers' BJW and self-esteem.

In the future, researchers should also pay closer attention than we did to individual differences in attitudes toward justice principles. Two people can agree that justice is an important value and should serve as a principle for guiding social interaction, but they might not agree about what justice means (Mikula, Petri, & Tanzer, 1990). Three main principles of distributive justice have been regularly identified in empirical research (e.g., Deutsch, 1985): the equality or parity principle, the achievement or contribution principle, and the need principle. Depending on which of these principles is preferred, the same distribution (e.g., of a teacher's support across students) can be judged differently. Teachers preferring the parity principle might be more inclined to apply the disharmony stereotype than teachers who prefer the achievement principle. Moreover, teachers with an egalitarian preference might hold more critical attitudes toward gifted education and less sympathy for gifted students. Research on an egalitarian perspective in the context of ethnic and cultural diversity has shown that it can induce a prevention focus in interethnic encounters (Vorauer, Gagnon, & Sasaki, 2009), which in turn can lead to the rejection of minority members (Correll, Park, Judd, & Wittbrink, 2002). Further research should test whether these findings can be transferred to the context of teaching gifted students.

We tested our hypotheses in a sample of preservice teachers and not in-service teachers. Prior studies found that beliefs about gifted students do not vary between in-service and preservice teachers (Baudson & Preckel, 2013; McCoach & Siegle, 2007). Nevertheless, replication studies are required to generalize our findings to other populations.

6.2 CONCLUSION: ARE BELIEFS ABOUT GIFTEDNESS A MATTER OF JUSTICE?

For teachers who have a strong justice motive, gifted students seem to present a kind of inequity that challenges teachers' BJW. These teachers defend their BJW by holding on to the disharmony stereotype of giftedness. Doing so is instrumental for their BJW

because the stereotype implies the neutralization of inequity by the assignment of negatively valued attributes. In our study, this attribute was maladjustment. According to justice theory and research, any other negative outcome (e.g., a bad fate) would serve the same purpose. Yet, given that the disharmony stereotype about the gifted is widely known, accepting the stereotype as truth seems to provide a comfortable heuristic for removing perceived injustice. It is a variant of the metaphor of cutting tall poppies.

The paradox of teachers' striving for justice is that attributing negative characteristics to the gifted creates an injustice with several facets. First, making an attribution of maladjustment to the gifted implies a discrimination and devaluation that is not backed by truth because the disharmony stereotype has been disconfirmed by empirical research (Neihart et al., 2002; Reis & Renzulli, 2004; Zeidner & Shani-Zinovich, 2011). Second, because stereotypes guide behavior, this incorrect stereotype applied by teachers with a strong need for justice is likely to generate behavior toward gifted students that is not appropriate and potentially harmful (e.g., labeling them and treating them as awkward). Third, under the condition that gifted and talented students have a right to be fostered, this right will likely be ignored by teachers who adhere to the disharmony stereotype. Thus, the need for justice may create the opposite: injustice. It seems mandatory to make these processes transparent to teachers who are affected by them.

Justice is a high value in all kinds of social interaction, but it is also difficult to achieve because ensuring justice for one person or group can imply injustice for others. For this reason, it seems advisable to pay more attention to justice issues in teacher education programs (Mills & Ballantyne, 2016). It also seems important to ask upcoming teachers and in-service teachers to reflect on their stereotypical beliefs toward student groups such as the gifted. An open, nonbiased, and student-oriented attitude toward students is crucial for positive teacher-student interactions. Moreover, the nonbiased assessment of students' strengths and weaknesses is a necessary condition for providing each student with optimal support.

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8. APPENDIX

Appendix A. Tests for Measurement Invariance of Preservice Teachers' Ratings of Students' Characteristics And Their Belief in a Just World with MGCFA (Four Vignette Versions) with Satorra-Bentler Correction in χ^2-Difference Testing for MLR Estimator.

Model	χ^2	*df*	*p*	CFI	Comparison	ΔCFI	$\Delta\chi^2$	Δ*df*	$p(\Delta\chi^2)$
INT									
Configural	35.445	20	.018	.962					
Partial metric	41.934	29	.057	.968	2 vs. 1	.006	6.991	9	.638
Partial scalar	53.624	41	.089	.969	3 vs. 2	.001	10.965	12	.532
SOE									
Configural	12.671	7	.081	.978					
Partial metric	22.665	15	.092	.970	2 vs. 1.	.008	10.587	8	.226
Partial scalar	31.257	23	.117	.967	3 vs. 2	.003	8.354	8	.399
MAL									
Configural	10.633	8	.223	.984					
Partial metric	18.649	16	.287	.984	2 vs. 1	.000	8.270	8	.408
Partial scalar	20.635	22	.543	1.000	3 vs. 2	.016	1.791	6	.938
BJW									
Configural	36.729	36	.435	.997					
Metric	49.824	51	.520	1.000	2 vs. 1	.003	13.244	15	.583
Scalar	61.331	66	.640	1.000	3 vs. 2	.000	10.897	15	.760

Note. N = 452. Restriction for partial invariance: INT: model average-ability boy: int4 with int3, model average-ability girl: int5 with int2; model gifted girl: int2 with int1; SOE: model gifted boy: soe3 with soe2, soe3 with soe1; model gifted girl: [soe2]; MAL: model gifted boy: mal3 with mal2, [mal1]; model average-ability girl: mal4 with mal2, model gifted girl: [mal1]. MGCFA = multigroup confirmatory factor analysis; *df* = degrees of freedom; CFI = comparative fit index. INT = intellectual ability; SOE = lack of social-emotional ability; MAL = maladjustment; BJW = belief in a just world.

CHAPTER V

GENERAL DISCUSSION

GENERAL DISCUSSION

The identification and the adequate fostering of gifted students is of great importance not only for the gifted themselves, but also for society in general. Because of the world's increasingly complex demands (e.g., regarding technology and globalization), people who are highly intelligent and well educated are needed. These people need to be identified early and they need to be fostered to develop their potential and hence, provide important innovations for the society.

Moreover, fostering the gifted is also important if we take up the idea of educational justice and inclusion as a current educational demand. The education system needs to be suitable for all students, and this means also for the gifted students. Whereas fostering weaker students (i.e., students' with learning disabilities or other special educational needs) in mainstream classes seems to be an omnipresent demand of inclusive education, there seems still to be some reluctance about engaging in special educational support for highly able students (e.g., Lassig, 2009). However, inclusion as a current educational goal may stress the demand that teachers need to foster every student according to his or her individual needs, and thus gifted students must not be neglected. As every student has the right to develop his or her potential, it is a matter of educational justice to enable gifted students to cultivate their talents. The identification and the fostering of gifted students are as important as fostering weaker students. To achieve a fair society in which all students can develop their potential best, both, gifted and weaker students need adequate educational provisions.

Teachers are crucial for student motivation, achievement, and personality development in school (e.g., Sabol & Pianta, 2012). Teacher beliefs about certain student groups can affect their perception of, and thus their interaction with individual group members (e.g., Pajares, 1992; Runco & Johnson, 2002). For instance, teacher beliefs can relate to teachers' enthusiasm and self-efficacy (Hachfeld, Hahn, Schroeder, Anders, & Kunter, 2015; Hellmich, Görel, & Schwab, 2016) which in turn can be associated with students' achievement and motivation (Caprara, Barbaranelli, Steca, & Malone, 2006). The importance of teacher beliefs about certain student groups is also stressed within current multidimensional models on the teaching profession (Kunter et al., 2013).

In order to fulfil the demand of the identification and the adequate fostering of gifted students, it is important that teachers have unbiased beliefs about the gifted. However, teacher beliefs about giftedness have been found to rely on incorrect stereotypical assumptions summarized in the disharmony hypothesis. According to the disharmony hypothesis, high intellectual ability comes along with deficits in non-cognitive domains (e.g., Baudson & Preckel, 2013, 2016; Carrington & Bailey, 2000; Lassig, 2009). Such beliefs about giftedness may influence which students they identify as gifted, but also how they engage with gifted students in class. For example, the widespread belief that due to high intellectual ability, gifted students will succeed in the educational system—even without special fostering—may result in less differential educational provisions. The assumption that giftedness comes along with deficits in non-cognitive domains can have consequences for the gifted students themselves (e.g., stigmatization and denying of ability) but also for teachers' motivation to engage with gifted students. A differentiated, unbiased view and the appreciation of gifted students with their strengths and weaknesses is highly desirable—not only in regard of educational justice, but also in regard of the benefits for society.

This dissertation presented three research articles (Chapter II–IV). In three studies, the present dissertation examined teacher beliefs about gifted students, the consequences of beliefs for teacher motivation and fairness beliefs as a possible explanation for negative assumption about gifted students' non-cognitive characteristics. This dissertation aimed to make a decisive contribution to further qualification of pre-service teachers in gifted education.

1. SUMMARY

In article 1 (Chapter II), teachers' stereotypical beliefs about students' giftedness with regard to the students' gender was examined in a sample of Australian pre-service teachers. Furthermore, it was tested whether the ratings were biased by social desirability using a vignette design. Results showed that Australian pre-service teachers considered gifted students superior regarding intellectual ability, but more maladjusted, compared to average-ability students. Furthermore, results revealed disadvantageous ratings for boys, as they were perceived as less socially and emotionally competent and less adjusted compared to female students. In addition, pre-service teachers seemed to perceive female

average-ability students' adjustment as most favorable compared to male average-ability students and gifted students. Findings point out the discrepancies between actual characteristics of gifted female and male students (e.g. Zeidner & Shani-Zinovich, 2011), and stereotypes in teachers' beliefs. Further, results revealed that social desirability did not change the significance or direction of the effects.

Article 2 (Chapter III) examined the relationship between German and Australian pre-service teachers' beliefs and their motivational orientations to teach gifted students. In summary, the findings painted an ambivalent picture of teacher beliefs in the sense of the disharmony hypothesis (i.e., high intelligence goes along with maladjustment) for pre-service teachers from both countries. Beliefs were negatively related to the self-efficacy for teaching gifted students. That is, pre-service teachers felt less well prepared for teaching gifted students compared to teaching average-ability students. Country-specific differences between Germany and Australia were only observed for students' gender. Australian pre-service teachers indicated typical gender stereotypes (e.g., Jones & Myhill, 2004) assuming boys less social-emotional competent and less adjusted than girls. Moreover, results provide hints for a stronger negative stereotyping of the gifted in Australia.

Article 3 (Chapter IV) shed light on the question whether negative beliefs about gifted students' non-cognitive characteristics derive from individuals' belief in a just world. Accordingly, gifted students' privilege in intelligence was assumed to threaten the belief in a just world. Indeed, the present findings, which are based on data of Belgian pre-service teachers, revealed that the justice motive (Ellard, Harvey, & Callan, 2016) provides a possible explanation for negative beliefs about non-cognitive characteristics of the gifted. In line with just world theory (Lerner, 1965, 1980), the extent of the attribution of negative adjustment was subject to pre-service teachers' belief in a just world. More precisely, the higher the belief in a just world, the more deficits in adjustment they ascribed to gifted students compared to students with average ability. However, participants with a low belief in a just world did not ascribe adjustment difficulties to gifted students. That is, the findings suggested that fairness plays a central role in teacher beliefs about giftedness. This finding was independent of students' gender and thus, comparable for gifted girls and boys.

Table 1. Short Summary of the key findings of articles 1, 2, and 3 (Chapter II–IV).

	Article 1: Do stereotypes strike twice?	**Article 2: Threat or challenge?**	**Article 3: Giftedness as a matter of justice?**
Aims	(1) Examining teacher beliefs about giftedness (2) Examining teacher beliefs about students' gender (3) Examining the interplay of gender stereotypes and stereotypes about giftedness (4) Testing the vignette design for its adequacy to assess beliefs by taking social desirable responding into account	(1) Examining teacher beliefs about giftedness in two countries (2) Examining motivational orientation to teach gifted students in two countries (3) Examining the relationship between teacher beliefs and the motivation to teach gifted students (4) Testing for the cross-national generalizability of the findings	(1) Examining teacher beliefs about giftedness (2) Examining the moderating effect of the belief in a just world for negative beliefs about gifted students' non-cognitive characteristics
Method	2x2 between-subjects experimental vignette design; *N* = 315 Australian pre-service teachers	2x2x2 between-subjects experimental vignette design; *N* = 690 German and Australian pre-service teachers	2x2 between-subjects experimental vignette design; *N* = 527 Belgian pre-service teachers
Analyses	MGCFA, measurement invariance testing over vignettes (4 groups), repeated-measures AN(C)OVA with latent factor scores and social desirability as covariate	MGCFA, measurement invariance testing over country and vignettes (8 groups), repeated-measures ANOVA with latent factor scores, MGSEM	MGCFA, measurement invariance testing over vignettes (4 groups), moderated moderation testing
Findings	– Evidence for the disharmony hypothesis – Evidence for common gender stereotypes – No interaction of giftedness and gender stereotypes – Social desirability occurs, but has no effect on the significant or direction of effects	– Evidence for the disharmony hypothesis – Evidence for common gender stereotypes – Evidence for cross-country generalizability – (Preliminary) evidence for stronger stereotyping in Australia – Evidence that beliefs about the gifted negatively relate to teachers' self-efficacy for teaching them	– Evidence for the disharmony hypothesis – Evidence for common gender stereotypes – Evidence that beliefs about the gifted are motivated by teachers' belief in a just world

2. TEACHER BELIEFS ABOUT GIFTEDNESS

In the following, the findings of the articles are discussed in regard to the general aims and research questions of this dissertation (see also Chapter I). Moreover, theoretical and methodological implications are discussed from a broader perspective.

2.1 ASSESSING EXPLICIT TEACHER BELIEFS: THE VIGNETTE APPROACH

An experimental between-subjects vignette design was used throughout the articles (Chapter II–IV). An important methodological implication concerns the question of whether vignettes can be used as a stimulus for explicit measures of teacher beliefs. In the vignette, a classroom situation open to interpretation was described. The target student's behavior could be interpreted either positively or negatively to elicit stereotypes. The two factors "students' ability level" and "gender" were experimentally manipulated and each participant was assigned to one vignette version. Proper experimental designs are required to allow causal conclusions for example by comparing beliefs about gifted students with a reference group. In this dissertation, the ratings on a gifted student were interpreted relative to the rating of an average-ability student who "experienced" the same reaction in the vignette. Social desirability was assessed to see whether such a vignette approach can be used to reduce the issue of social desirability in explicit measures (see also Chapter II). By accounting for teachers' social desirability, it was ensured that the effects are due to the manipulation of the stimulus, so that an examination of the effects of students' ability and gender were valid. Findings of this dissertation underpin the conclusion that the vignette approach is effective for assessing explicit beliefs. Using such a vignette approach in research on teachers professional competencies can contribute to a deeper understanding of the basis of teacher beliefs. Further research is well advised to use vignettes as an explicit measure to assess teachers' beliefs.

Taken together, research on teacher beliefs or on stereotypes in general can profit from using this methodological vignette approach when assessing explicit beliefs.

2.2 THE DISHARMONY HYPOTHESIS: TEACHER BELIEFS ABOUT GIFTEDNESS

The results of all three articles (Chapter II–IV) showed that teacher beliefs were in line with the disharmony hypothesis: Pre-service teachers in all three studies considered gifted students as superior regarding their intellectual ability, but more maladjusted, compared to average-ability students. This dissertation assessed pre-service teachers' beliefs from three different countries: Australia, Germany and Belgium. All studies revealed the same pattern. Thus, pre-service teachers' assumption that giftedness comes along with maladjustment seems to be very prevalent across countries.

By contrast, in all three studies, which implies all three countries, there was no evidence that pre-service teachers combine social-emotional deficits with giftedness. This suggests that giftedness is associated with adjustment problems but not with issues in social-emotional domains. This is striking, given that previous findings revealed teachers to perceive gifted students with social-emotional deficits such as being self-contained and introverted (e.g., Baudson & Preckel, 2013; Busse, Dahme, Wagner, & Wieczerkowski, 1986a, 1986b). However, the operationalization of social-emotional deficits in this dissertation was quite different to those in previous studies. That is, in this dissertation, social-emotional ability was assessed as rather interpersonal behavior (i.e., lacking social skills, being withdrawn) than intrapersonal characteristics (i.e., lonely, unhappy) like previous studies did. Whether teacher beliefs combine both negative assumptions about adjustment and intrapersonal social-emotional deficits needs to be clarified in future studies.

The factorial validity of the questionnaire was ensured for all three studies. However, to get a more differentiated picture about teacher beliefs, the questionnaire used in this dissertation may benefit from a further content development—not only for the factor social-emotional ability, but potentially also for the factor intellectual ability and maladjustment. One possibility may be to divide each factor into two further components: one psychological component summarizing intrapersonal characteristics, and one pedagogical component summarizing interpersonal characteristics such as interactions with peers and teachers. In doing so, the factor "lack of social-emotional abilities" may be specified into "internalized (emotional) problem behavior" (psychological component) and "lack of social skills" (pedagogical component). The factor maladjustment may benefit from a division into "externalized problematic behavior" (psychological

component) and "handling of the student in class" (pedagogical component). Furthermore, beliefs about students' ability may comprise two subcomponents: One for assumptions about students' "intellectual ability" (psychological component) and one for "achievement motivation in school" (pedagogical component). Such a differentiation of the three factors used in this dissertation, may lead to a more differentiated picture of teacher beliefs not only about gifted students, but also about students in general. Further investigations are encourage to develop this questionnaire.

2.3 GENDER-SPECIFICITY OF TEACHER BELIEFS ABOUT GIFTED GIRLS AND BOYS

Another aim of this dissertation was to examine whether teachers' beliefs about gifted students' characteristics differ for boys and girls. This was considered as relevant because typical gender stereotypes assume boys to be less social-emotional competent and less adjusted than girls (e.g., Deaux & LaFrance, 1998; Jones & Myhill, 2004). Thus, in the first article (Chapter II), Australian pre-service teachers were asked to rate gifted versus average-ability girls and boys. Results showed gender effects that revealed disadvantageous ratings for boys, as they were perceived as less socially and emotionally competent and less adjusted compared to female students reflecting typical gender stereotypes (e.g., Jones & Myhill, 2004). However, regarding the research question whether beliefs about giftedness depend on students' gender, the results of article 1 (Chapter II) revealed that gifted male and female students were perceived as equally more maladjusted compared to average-ability students. Following up on this finding, the second (Chapter III) and third article (Chapter IV) further included students' gender in their analyses. Results of both articles supported the conclusion that stereotypical beliefs about giftedness and gender are not gender specific. That is, there is evidence for gender stereotypes and stereotypes about the gifted in teacher beliefs, but when teachers rated a gifted boy or girl, it seems that pre-service teachers only considered the ability group and not students' gender. These findings indicate that individuals use stereotypical beliefs in a flexible way (Brewer, 1996). This can be explained by the concept of construct accessibility and activation (Collins & Loftus, 1975; Higgins & King, 1981; Oakes & Turner, 1990; Stangor, 1988) according to which stereotypical beliefs may be differentially accessible across contexts (Stangor & Lange, 1994). In this manner, the use of stereotypical beliefs as a basis for teacher ratings on gifted boys and girls may depend

on how the target student was categorized (i.e., as girl/boy or as gifted/average-ability). That is, when participants were asked to rate a gifted/average-ability boy or gifted/average-ability girl, the concept "ability level" might be more salient than the student's gender and thus, they relied on rather stereotypical beliefs about giftedness. In contrast to that, a study by Preckel et al. (2015) found that pre-service teachers associated only gifted male students with adjustment deficits using implicit measures. According to dual process models (e.g., Gawronski & Bodenhausen, 2006, 2011), different cognitive processes are associated with implicit and explicit beliefs. Implicit beliefs are understood as the result of associative, automatic processes, whereas explicit beliefs are described as product of propositional processes. Explicit and implicit beliefs can differ (e.g., Gawronski & Bodenhausen, 2006, 2011). For teacher beliefs about giftedness, implicit beliefs were found to associate gifted males with maladjustment, but gifted females not (Preckel et al., 2015). However, findings of this dissertation found explicit beliefs, that is, beliefs that people consciously endorse, do not include assumptions about gifted students' gender. Hence, implicit and explicit teacher beliefs about gifted students' non-cognitive deficits differ in regard to students' gender.

2.4 MOTIVATIONAL ORIENTATIONS FOR TEACHING THE GIFTED

Moreover, the findings indicated an important relationship between pre-service teachers' beliefs and their motivational orientations. High intellectual ability was positively related to enthusiasm and self-efficacy. That is high intellect was perceived as stimulating and hence enhanced pre-service teachers' enthusiasm and self-efficacy for teaching. However, students' giftedness, when associated with high maladjustment ratings, lowered pre-service teachers' self-efficacy for teaching the gifted. That is, when giftedness is combined with assumptions about adjustment deficits, gifted students are perceived as strenuous and difficult to handle in class. Consequently, pre-service teachers' self-efficacy for teaching gifted students decreased. This finding also reflects the ambivalence of the disharmony hypothesis according to which giftedness bears both, negative and positive connotations: Intellectual ability is typically highly desirable and thus, positively perceived, whereas non-cognitive domains are rather perceived as problematic (Preckel & Vock, 2013).

Self-efficacy can be perceived as indicator for actual behavior in classroom. Based on the present findings of low self-efficacy for teaching gifted students, one may speculate that pre-service teachers do not consider themselves able to provide adequate educational provisions for the gifted. However, to get an actual picture about problems pre-service teacher might face with gifted students, further research is needed. In this line, a rather qualitative approach in form of interview studies asking pre-service teachers about difficulties they assume to face when teaching gifted students may best encounter actual effects in classrooms.

2.5 FAIRNESS BELIEFS AS A MOTIVATIONAL EXPLANATION

Stereotypical beliefs help us to navigate in a complex world by quickly categorizing incoming information (e.g., Katz, 1960; Smith, Bruner, & White, 1956). An important question this dissertation addressed was why teachers associate giftedness with deficits in non-cognitive domains, although they are not substantiated by empirical research. In this manner, motivational aspects of stereotyping and their effects are of high interest. Few empirical studies had investigated the underlying processes that motivate teachers' beliefs about gifted students. Article 3 (Chapter IV) revealed that the justice motive (Ellard et al., 2016) plays an important role for beliefs in line with the disharmony hypothesis. More precisely, the findings show that the disharmony hypothesis may be a reflection of teachers' desire for justice. The fact that exceptionally high intellectual abilities imply better preconditions to succeed in the educational system (or life in general) seems to be a threat for the belief in a just world. Hence, negative beliefs about non-cognitive characteristics may be due to a perceived injustice and description of non-cognitive deficits in order to re-establish subjective fairness. Thus, the justice motive may be important for research on teaching and teacher education especially when a particular student group benefits from a certain privilege by nature or circumstances like the gifted do. Thus, the just world theory (Lerner, 1965, 1980) could not only be interesting for research on teacher beliefs about the gifted, but also for research on teacher beliefs about students from other privileged groups such as students from socio-economic beneficial contexts/families in contrast to disadvantaged contexts/families.

Of course, stereotypical beliefs about the gifted or privileged groups in general may also have other causes. Beliefs are always multi-determined and the motivation for

and psychological functions of stereotypical beliefs can be very different. That is, a teacher does not necessarily stereotype the gifted because of the motivation to defend his or her belief in a just world. Stereotyping could also be caused by other motives or serve other psychological functions.

One may also consider further rationales such as cognitive explanations of the stereotyping for example by assistance of group-processes. Thus, the social identity theory (Tajfel & Turner, 1979) may help to shed light onto the mechanism explaining the negative assumptions about gifted students' non-cognitive characteristics. This theory focuses on "the group in the individual" (Hogg & Abrams, 1988) and states that a person's self-concept is partly defined by his or her belonging to a social group. In this manner, people categorize other people and themselves and in doing so, evaluate the resulting groups. A person's social identity is the result of the value placed on the personal group membership (e.g., gender, ability group). According to the social identity theory, people can enhance their self-esteem by a positive evaluation of their own group (Turner, Brown, & Tajfel, 1979). As part of the social identity process, people show positive behavior such as solidarity within their own group, and discriminations against the out-group (Abrams & Hogg, 1988). Based on the group categorization, differences between the groups are stressed, whereas differences between individuals within a group are underestimated (Tajfel, 1959). That is, if a teacher perceive his or herself as gifted and if this is crucial for his or her self-concept, the social identity should lead to an overall positive evaluation of the gifted in order to enhance self-esteem. On the other side, if a teacher perceive his or herself as average-ability person, this should lead in a rather negative evaluation for example concerning non-cognitive characteristics of the gifted in line with the disharmony hypothesis. Further research needs to address further fundamental processes underlying the stereotyping of the gifted.

Moreover, one could also expect teachers' gender to play an important role for the stereotyping process. A person's gender is central to the social identity of most people. According to the social identity theory, people want the in-group to stand out positively from an out-group (positive distinctiveness). Therefore, it is good to know members of the in-groups who have status-related traits. High intellectual ability as a characteristic of giftedness may be highly desirable and thus, status-related. Male teachers should therefore value gifted boys, but not gifted girls. For female teachers, it should be the other

way around. However, social comparison processes as an alternative explanation, would expect the opposite.

According to Festinger's theory of social comparison processes (1954), people are more likely to compare themselves with people who are similar to them. According to this consideration, female teachers should feel more threatened by gifted girls, and male teachers by gifted boys. Further research may aim to elaborate how teachers' gender interact with gifted students' gender.

3. IMPLICATIONS FOR TEACHER EDUCATION

Although beliefs can generally correspond to actual characteristics to some extent, they can deviate from the actual perspective. The present findings corroborate that this also applies to teacher beliefs about gifted students. More precisely, giftedness was consistently associated with high intellectual ability and maladjustment, while empirical research did not confirm deficits in non-cognitive characteristics such as the vulnerability to mental disorders, or life satisfaction (e.g., Francis, Hawes, & Abbott, 2016; Zeidner & Shani-Zinovich, 2011). Gifted students were found to be as heterogeneous in their non-cognitive characteristics as the average-ability students.

Research showed that negative stereotypes toward a social group come along with prejudiced attitudes that can result in discriminative behavior (Kawakami, Dion, & Dovidio, 1998; Maio, Haddock, Manstead, & Spears, 2010). Applied to the present findings, negative assumptions about gifted students' adjustment could result in depriving gifted students of challenging educational provisions. This assumption may be stressed by findings of article 2 (Chapter III) who showed that pre-service teachers did not feel well prepared for teaching gifted students. Teachers' self-efficacy can relate to actual classroom behavior (Frenzel, Goetz, Lüdke, Pekrun, & Sutton, 2009; Kunter et al., 2008). One might speculate that based on the present findings, teachers feel not capable for an adequate engagement with gifted students, which could result in the avoidance of challenging opportunities.

Moreover, as beliefs are likely to affect people's perceptions, incorrect beliefs about gifted students' characteristics may also affect teachers' identification of gifted students (Baudson & Preckel, 2016).

Negative stereotypical beliefs are also likely to effect the individuals directly. For example, the stereotype threat (Steele & Aronson, 1995) describes the threat of being viewed through negative stereotypes and the fear confirming that stereotype by actions. For the effect of stereotype threat, it is necessary that students are aware of the stereotype. Stereotype consciousness emerges by age 6 and is widespread by age 10 (McKown & Weinstein, 2003). Thus, the issue of stereotype threat is relevant for both, primary as well as secondary education. The effects of the stereotype threat has been found to operate for many stereotyped groups such as the "girls can't do math" stereotype for females in mathematics (Steele, 2003). When negative stereotypes are salient for a group member, it is likely to influence behavior and performance even if the individual does not agree with the stereotype. For gifted students, the stereotype threat can result in de-identification and withdrawing from the ability domain (e.g., Swiatek, 2001).

How can the findings of the present dissertation assist to reduce negative consequences of inaccurate beliefs such as less education provision for gifted students and the stereotype threat? One opportunity may be the engagement with incorrect teacher beliefs in teacher education. Findings of the present dissertation revealed implications for teacher education programs to encounter incorrect beliefs.

First, teacher educators are advised to talk about the stereotype concerning the disharmony hypothesis and to encourage reflection of beliefs. That is, teacher education should make pre-service teachers aware of their stereotypical beliefs. In doing so, the vignette approach used in this dissertation may assist teacher educators as diagnostic instrument (Baudson & Preckel, 2016).

Second, teacher education courses should inform pre-service teachers about actual characteristics of gifted students and the nature of giftedness and compare empirical evidence with stereotypical beliefs. A discussion of the "grain of truth" hypothesis and consequences of applying group characteristics to an individual may lead to further reflection. Previous research already revealed positive effects of information transfer on teachers' attitudes. Learning about giftedness and the needs of gifted students, revealed improvements on teachers' attitudes (e.g., Bangel, Moon, & Capobianco, 2010; Copenhaver & Mc Intyre, 1992; Hansen & Feldhusen, 1994; Moon, Callahan, & Tomlinson, 1999).

Third, the findings of article 3 emphasized not only the importance of informing pre-service teachers about the incorrectness of the disharmony stereotype, but to engage with the question why people do hold such beliefs and where they might come from. That is, it may also be important to explain the psychological function of stereotypes and the formation of stereotypical beliefs through motivational bases. Including motivational aspects of stereotyping (e.g., belief in a just world) in teacher education courses may help pre-service teachers' self-reflection. Article 3 (Chapter IV) showed that one reason why pre-service teachers hold negative beliefs about gifted students might be their sense of fairness (i.e., their belief in a just world). The idea that exceptionally high intellectual abilities imply better preconditions to succeed in the educational system can be perceived as unfair. Pre-service teachers might feel that weaker students either need most of the support because they deserve it, based on the need principle or because supporting the weaker students is most important for reaching the average learning goals. Such a rationale might be instrumental for optimizing the overall teaching success. It would also be fair toward weaker students. However, it might also be considered unfair toward the gifted students. Such a discussion on fairness in the context of giftedness may form an important concept for pre-service teachers' change of incorrect beliefs.

Fourth, to push the change for incorrect beliefs, knowledge transfer and reflection may be combined with practical elements. Especially, the findings of article 2 (Chapter III) point to the relevance of fostering not only the knowledge about giftedness, but also the self-efficacy for teaching the gifted. A large body of research on teacher education indicated the effectiveness of combining theoretical knowledge with practical elements (e.g., Bangel et al., 2010; Hansen & Feldhusen, 1994; Megay-Nespoli, 2001; Moon et al. 1999; Tomlinson et al., 1994). One idea for teacher education programs may be the actual teaching of gifted students during a placement in school. However, such placement would require special gifted education classes and may not be very practicable. Hence, the use of video graphed teaching sessions with a discussion on the teaching situation, the teacher-student interaction, and gifted student's behavior in comparison to other non-gifted students in class, may be a useful approach. Combining knowledge transfer with practical elements may not only lead to stereotype change through (anticipated) contact with gifted students (for how to design contact programs for stereotype change see the

discussion of article 1, Chapter II) , but also may enhance pre-service teachers' self-efficacy for teaching the gifted.

It is likely that research on gifted education and thus on teacher education in gifted education will further increase over the next few years due to the increasing social, political and scientific interest (Preckel & Krampen, 2016). Currently, the initiative "Leistung macht Schule" was launched by the German Federal Government, which aims to promote the educational development opportunities of top-performing students in mainstream schools. For this purpose, schools across Germany are collaborating with research groups to develop practical modules for teacher trainings (Bundesministerium für Bildung und Forschung [Federal Ministry of Education and Research], 2018). In order to assist implementations of gifted education in mainstream classes, the results of the present dissertation may assist to design effective teacher training programs to challenge incorrect beliefs about giftedness. Results of the present dissertation recommend to engage with incorrect beliefs about the gifted by providing knowledge transfer, by discussing fairness aspects (i.e., that giftedness can threaten the belief in a just world), and by providing practical elements. However, well-designed intervention studies are needed to test whether these recommendations are practicable and effective.

4. LIMITATIONS, STRENGTH AND FUTURE RESEARCH DIRECTIONS

The studies, presented in this dissertation, used a vignette design and asked pre-service teachers to rate the characteristics of a described student. This method is appropriate and was used before to assess teacher beliefs about students (e.g., Baudson & Preckel, 2013) and their self-efficacy for teaching (e.g., Ashton, 1984). However, it must be recognized that the participants did not respond to "real students" in "real classrooms". Thus, one might criticize that this could have reduced the ecological validity of the findings. A setting in which teachers would be asked to rate characteristics of an actual gifted student in their class or a student they know, would increase the generalizability to actual classroom situations. However, for reasons of intern validity and experimental manipulation, it is important that—independent of the manipulation—all teachers get the same information. This can best be ensured by using standardizes stimulus materials such as vignettes.

This dissertation found teacher beliefs to combine high intellectual abilities with maladjustment when rating a gifted student in an academic setting. That is, the situation described in the vignette was an everyday school situation in which the target student first engages in an individual activity (book) and later on in a social activity (asking other students a question who react with a counter question). However, beliefs can depend on the contextual demands of situations (Bodenhausen & Lichtenstein, 1987). A gifted student portrait in a sportive context might be associated with different beliefs such as high achievement, talent, and popularity. Further research should investigate how teacher beliefs appear in further contexts.

All three studies presented in this dissertation were conducted using a between-subjects design. Each pre-service teacher only read and rated one vignette. A within-subjects design would have had the advantage of higher statistical power. However, it would most likely have had negative effects on internal validity due to demand effects or effects of irrelevant information. Demand effects refer to changes in ratings due to cues about what constitutes appropriate ratings. In a within-subjects design, the variation of the two experimental factors (students' ability level and gender) would have become obvious. This would have made it easy for participants to hypothesize about the purpose of the study. To avoid such demand effects, one may vary the vignette versions not only with regard to ability level and gender but also with regard to other information in order to distract the readers' attention from the main variables, ability level and gender. This additional information would need to be irrelevant with respect to students' ability level or gender so that any other beliefs associated with ability level or gender will not be activated. This is hard to achieve because this desires a control for how this additional irrelevant information influences teacher ratings.

This dissertation assessed teacher beliefs in samples of pre-service teachers. Despite the great relevance of the results for teacher education, one might criticize that the results might not accurately portray beliefs of classroom teachers with overall more professional experience. This point may be reasonable if in-service teachers do have more knowledge of giftedness and experience with gifted students. In the three studies of the present dissertation, pre-service teachers overall reported little knowledge about and experience with giftedness. Empirical studies revealed that only few in-service teachers had ever participated in a training program on giftedness and do lack knowledge about

giftedness (Heller, Reimann, & Senfter, 2005). Consequently, one may conclude that the overall experience and knowledge of pre- and in-service teachers are comparable. This is in line with research showing that in-service teachers also rely on the disharmony hypothesis (e.g., Baudson & Preckel, 2013, 2016; Lee, Cramond, & Lee, 2004; McCoach & Siegle, 2007; Preckel et al., 2015). However, to conclude whether the present findings (e.g., examining pre-service teachers' motivational basis of stereotypes toward gifted) are applicable to actual in-service teachers, one may want to replicate the studies outlined above with actual in-service teachers.

Following-up with the previous point, a differentiated investigation, whether knowledge about and experience with giftedness result in accurate beliefs about giftedness and higher self-efficacy for teaching the gifted, may be interesting. In the present dissertation, overall pre-service teachers reported little knowledge about and experience with the gifted. However, knowledge and experience was assessed with one item only. Future studies should investigate experience and knowledge with more comprehensive measures.

5. CONCLUSION

The aim of the present dissertation was to contribute to a further understanding of teacher beliefs about giftedness. The three studies revealed that pre-service teachers hold beliefs in line with the disharmony hypothesis. Typically, they assumed that gifted students possess high intellectual abilities, but poor adjustment skills. Stereotypical beliefs about giftedness become problematic, when (1) assumed group characteristics of the gifted are applied to individual gifted students for whom those attributes might not be valid and (2) when assumptions about adjustment deficits negatively affect the teacher-student interactions. Indeed, findings of this dissertation revealed maladjustment beliefs to be negatively related to self-efficacy for teaching the gifted. In the light of the present findings, the need for effective and efficient teacher education programs arises that prepare pre-service teachers for teaching gifted students. Thus, pre-service teachers need to be educated about the foulness of the disharmony hypothesis and be encouraged to re-think their beliefs. Informing about the psychological dynamics that underlie such beliefs may be helpful to foster self-reflection. This dissertation suggest transparency about the fact that fairness beliefs can motivate negative beliefs about gifted students' adjustment.

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CURRICULUM VITAE

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ACADEMICS

Since Nov 2015	Doctoral Student at the Graduate School "Teaching and Learning Processes", University of Koblenz-Landau, Germany. Research Associate in the Department of Psychology, working group Personality, Psychological Assessment, and Psychological Methods, Prof. Manfred Schmitt, University of Koblenz-Landau, Landau, Germany.
Aug 2015 – Oct 2015	Student Research Assistant, University of Koblenz-Landau, Graduate School "Teaching and Learning Processes".
Apr 2013 – Jul 2015	Student Research Assistant, University of Luxembourg, research group Computer-Based-Assessment (Prof. Samuel Greiff).
Sep 2013 – Apr 2015	Student Research Assistant, University of Trier, Giftedness Research and Education at the Department of Psychology (Prof. Franzis Preckel).

EDUCATION

Oct 2013 – Oct 2015	Master of Science in Psychology, University of Trier, Germany. Master Thesis: Einstellungen und Ansichten Lehramtsstudierender gegenüber Hochbegabung: Eine interkulturelle Vergleichsstudie [Teachers' attitudes toward and perceptions about giftedness].
Oct 2010 – Mar 2014	Bachelor of Science in Psychology, University of Trier, Germany. Bachelor Thesis: THINK (Test zur Erfassung der Intelligenz im Grundschulalter) und Teilleistungsstörungen: Gibt es systematische Gruppenunterschiede? [Test for (highly) intelligent kids (THINK) and learning disabilities: Are there systematic differences in assessment?].
Jun 2010	Abitur

RESEARCH STAYS

Feb 2018 – Apr 2018	Research stay at Monash University, Faculty of Education, Dr. Leonie Kronborg, Clayton (Victoria), Australia.
Jul 2017 – Sep 2017	Research stay at Monash University, Faculty of Education, Dr. Leonie Kronborg, Clayton (Victoria), Australia.
Apr 2015 – Jun 2015	PROMOS-scholarship for conducting the Master Thesis, Monash University, Faculty of Education, Dr. Leonie Kronborg, Clayton (Victoria), Australia.

RESEARCH INTERNSHIPS

Dec 2014 – Mar 2015	Research internship, Giftedness Research and Education, Department of Psychology, Prof. Dr. Franzis Preckel, University of Trier, Trier, Germany.
Apr 2013 – Aug 2013	Research internship, Giftedness Research and Education, Department of Psychology, Prof. Dr. Franzis Preckel, University of Trier, Trier, Germany.

PUBLICATIONS

Articles (peer-reviewed)

Matheis, S., Preckel, F., Weyns, T., Verschueren, K., & Schmitt, M. (submitted). Giftedness as a matter of justice? *The relation between pre-service teachers' beliefs about the gifted and their belief in a just world*. Manuscript submitted for publication.

Matheis, S., Keller, L. K., Kronborg, L., Schmitt, M., & Preckel, F. (under review). *Do stereotypes strike twice? Giftedness and gender stereotypes in teachers' beliefs about student characteristics in Australia*. Manuscript submitted for publication.

Matheis, S., Kronborg, L., Schmitt, M., & Preckel, F. (2018). Threat or challenge? Teacher beliefs about gifted students and their relationship to teacher motivation. *Gifted and Talented International*. Advance online publication. doi:10.1080/15332276.2018.1537685

Book Chapters

Matheis, S., Eulberg, H., Hagelauer, M. L., & Preckel, F. (in press). Akzeptanz, Erwartungen, Vorurteile – Vorstellungen von Lehrkräften zu Hochbegabten [Acceptance, expectations, stereotypes – Teacher beliefs about giftedness]. In: *Gesichter von Hochbegabung.*

Theses

Matheis, S. (2015). *Einstellungen und Ansichten Lehramtsstudierender gegenüber Hochbegabung: Eine interkulturelle Vergleichsstudie* [Teachers' attitudes towards and perceptions about giftedness] (Unpublished Master Thesis). Trier, Germany: University of Trier.

Matheis, S. (2014). *THINK (Test zur Erfassung der Intelligenz im Grundschulalter) und Teilleistungsstörungen: Gibt es systematische Gruppenunterschiede?* [Test for (highly) intelligent kids (THINK) and learning disabilities: Are there systematic differences in assessment?] (Unpublished Bachelor Thesis). Trier, Germany: University of Trier.

Reports

Matheis, S., & Porten, J. (2015). Freeing minds – How to let women shine through education. In: J. M. Nebe (Ed.) *Project Report: Women Empowerment in Kenya – Challenges, Opportunities and Prospects*. University of Trier.

GRANTS AND SCHOLARSHIPS

World Council for Gifted and Talented Children (WCGTC) scholarship for paper presentation at the WCGTC July 2017 in Sydney, (New South Wales) Australia.

"Best Poster" Price at the European Conference on Educational Research (ECER), Emerging Researcher Conference, August 2016, Dublin, Ireland.

DAAD PROMOS scholarship for conduction the Master Thesis at Monash University, Clayton, (Victoria) Australia.

CONFERENCE CONTRIBUTIONS AND INVITED TALKS

Matheis, S. (Aug 2018). Chair and discussant of invited Symposium: Matheis, S., Noll, A., Twardawski, T., Hofmann, R., Wirag, A., Ebel, M., & Lichti, M., Assembling the puzzle of teaching and learning: Proximal processes in classrooms examined from multiple perspectives, MoSAiK Conference: The interplay of theory and practice in teacher education, Koblenz, Germany.

Matheis, S., Keller, L. K., Kronborg, L., Schmitt, M. & Preckel, F. (Aug 2018). Teachers' beliefs about students: The relevance of students' gender, ability and teachers' motivation. Symposium Presentation: Proximal processes in classrooms examined from multiple perspectives, MoSAiK Conference: The interplay of theory and practice in teacher education, Koblenz, Germany.

Matheis, S., Weyns, T., Verschueren, K., Preckel, F., & Schmitt, M. (Jul 2018). Giftedness as a matter of justice? Teachers' beliefs about gifted students and the role of their own belief in a just world. Poster Presentation at the International Conference on Justice Research (ISJR), Atlanta; Georgia, USA.

Matheis, S., Kronborg, L., Schmitt, M., & Preckel, F. (Apr 2018). Threat or challenge? Teachers' beliefs about gifted students and their relations to teacher motivation. Poster Presentation at the Conference of the American Educational Research Association (AERA), New York City, NY, USA.

Matheis, S., Kronborg, L., Schmitt, M., & Preckel, F. (Feb 2018). Examining the interplay of teachers' beliefs, and motivational orientations for teaching gifted students. Poster Presentation at the Gesellschaft für empirische Bildungsforschung (GEBF) [Society for Empirical Educational Research], Bern, Switzerland.

Matheis, S., Schmitt, M., & Preckel, F. (Jan 2018). An experimental approach to investigate and to clarify teachers' beliefs about gifted students. Poster Presentation at the 16th Annual Hawaii International Conference on Education (HIC18), Honolulu, HI, USA.

Matheis, S. (Aug 2017). Challenges for the educators of the gifted: Australian pre-service teachers' stereotypes about gifted boys and girls. Invited Talk for the Education Faculty Webinar at Monash University, Campus Clayton, Melbourne, Victoria, Australia.

Matheis, S., Preckel, F., Schmitt, M., & Kronborg, L. (Jul 2017). Australian preservice teachers' beliefs about gifted boys and girls. Talk at the Australian Teacher Education Conference (ATEA), Brisbane, Queensland, Australia.

Matheis, S., Preckel, F., & Kronborg, L. (Jul 2017). Can I handle this highly intelligent but maladjusted gifted student? International comparison of gifted stereotyping. Paper presented at the Biennial World Conference for the Gifted and Talented Children 2017 (WCGTC), Sydney, NSW, Australia.

Matheis, S., Schmitt, M., & Preckel, F. (Jun 2017). Explaining pre-service teachers' gifted stereotyping by using differential personality concepts. Poster Presentation at the 5th Biennial Meeting of the Association for Research in Personality (ARP). Sacramento, California, United States of America.

Matheis, S., Preckel, F., & Kronborg, L. (Sep 2016). Hochintelligent, aber verhaltensauffällig? Einstellungen Lehramtsstudierender gegenüber hochbegabten Schüler/innen im interkulturellen Vergleich [Gifted but maladjusted? Pre-service teachers' attitude toward gifted students in a cross-cultural comparison]. Talk at the 50. Kongress der Deutschen Gesellschaft für Psychologie (DGPS) [50th Congress of the German Psychological Association], Leipzig, Deutschland.

Matheis, S., Preckel, F., & Schmitt, M. (Aug 2016). Is giftedness a matter of justice? Explaining teachers' attitudes towards gifted students. Pecha Kucha Presentation and Poster Presentation at the European Conference on Educational Research 2016 (ECER), Dublin, Ireland. [Best Poster Winner].

Matheis, S., & Preckel, F. (Jul. 2016). Gifted, maladjusted, male? Student teachers` attitudes about the gifted. Poster Presentation at 18th European Conference on Personality (ECP 18), Timisoara, Romania.

Matheis, S., Preckel, F. & Kronborg, L. (Mar 2016). Annahmen und Einstellungen Lehramtsstudierender gegenüber hochbegabten Jungen: eine interkulturelle Vergleichsstudie [Pre-service teachers' ideas and attitudes toward gifted boys in a cross-cultural comparison study]. Poster Presentation at the 4. Fachtagung der Gesellschaft für Empirische Bildungsforschung (GEBF) [Society For Empirical Educational Research], Berlin, Germany.

Matheis, S., & Preckel, F. (Dec 2015). Männlich, hochbegabt, verhaltensauffällig? Implizite Einstellungen Lehramtsstudierender gegenüber Schüler(inne)n mit Hochbegabung [Male, gifted, maladjusted? Pre-service teachers' attitudes toward gifted students]. Poster Presentation at the 3rd Gender & Diversity Research Day, University of Koblenz-Landau, Landau, Germany.

Preckel, F., Matheis, S., & Kronborg, L. (Aug 2015). Pre-service Teachers' Attitudes and Beliefs about the Gifted: A Cross-Cultural Comparison Study. Study presented at the 21st Conference of the World Council for Gifted and Talented Children (WCGTC), Odense, Denmark.

WORKSHOPS

Jun 2017	Matheis, S., Weis, S., & Schreiber, W.: Workshop for high-performing students in science: Schnell = schneller? Messen in der Psychologie [Fast = faster? Measurement in Psychology]. MINT-EC-Camps Mathematik im Kontext von Bildung, Mensch und Umwelt [Mathematics in the context of education, human being and environment] Pfalzmetall Foundation.
Sep 2016	Matheis, S. & Twardawski, M.: Workshop „p-hacking – Replication crisis in Psychology and how we can go on. Colloquium, DGF-Graduate-School „Teaching and Learning Processes“, University of Koblenz-Landau, Landau, Germany.

TEACHING

2018	Seminar methods in behavior observation and psychological conversation (B.Sc. Psychology), University of Koblenz-Landau.
2017/2018	Seminar experimental designs (B.Sc. Psychology), University of Koblenz-Landau.
2016/2017	Seminar experimental designs (B.Sc. Psychology), University of Koblenz-Landau.

REVIEWS

Member Academic Committee of the World Council for Gifted and Talented Children (WCGT). Reviewer of abstract proposals for the 23rd Biennial World Council for Gifted and Talented Children World Conference parallel sessions, symposia, and poster presentations.

Universitas Psychologica (special issue about educational psychology).

MEMBERSHIPS

Deutsche Gesellschaft für Psychologie (DGPS) [German Psychological Society].

World Council for Gifted and Talented Children (WCGTC).

DECLARATION OF ORIGINALITY

I hereby declare that I have written the present dissertation independently, without assistance from external parties and without the use of other resources than those indicated. This dissertation has not been submitted previously for grading at this university or any other academic institution.

AUTHORSHIP AND PUBLICATION STATUS

The article presented in Chapter II to IV were submitted for publication or have been published in international peer-reviewed journals. In collaboration with the co-authors, the articles were primarily conducted and written by Svenja Matheis, Doctoral Candidate at the DFG-Graduate School "Teaching and Learning Processes", Koblenz-Landau University. Hereafter the authors and publication statuses of the articles are entitled.

Article 1 (Chapter II)	Matheis, S., Keller, L. K., Kronborg, L., Schmitt, M., & Preckel, F. (under review). *Do stereotypes strike twice? Giftedness and gender stereotypes in teachers' beliefs about student characteristics in Australia.* Manuscript submitted for publication.
Article 2 (Chapter III)	Matheis, S., Kronborg, L., Schmitt, M., & Preckel, F. (2018). Threat or challenge? Teachers' beliefs about gifted students and their relationship to teacher motivation. *Gifted and Talented International*. Advance online publication. doi:10.1080/15332276.2018.1537685
Article 3 (Chapter IV)	Matheis, S., Preckel, F., Weyns, T., Verschueren, K., & Schmitt, M. (submitted). *Giftedness as a matter of justice? The relation between pre-service teachers' beliefs about the gifted and their belief in a just world.* Manuscript submitted for publication.

Landau, November 2018 Svenja Matheis