

Pre-service teachers' implicit and explicit attitudes toward obesity influence their judgments of students

Sabine Glock¹ · Arnoud Oude Groote Beverborg² ·
Barbara C. N. Müller³

Received: 3 December 2014 / Accepted: 11 June 2015 / Published online: 1 October 2015
© Springer Science+Business Media Dordrecht 2015

Abstract Obese children experience disadvantages in school and discrimination from their teachers. Teachers' implicit and explicit attitudes have been identified as contributing to these disadvantages. Drawing on dual process models, we investigated the nature of pre-service teachers' implicit and explicit attitudes, their motivation to respond without prejudice, and how attitudes influence their judgments of an obese student. Results showed that implicit anti-obesity bias might stem from an implicit positivity toward thinness rather than from an implicit negativity toward obesity. Explicit attitudes were mixed: positive attitudes toward achievement, a dislike of obese persons, and neutral attitudes concerning blame and health responsibility emerged. Implicit and explicit attitudes affected judgments of language proficiency and intelligence: pre-service teachers with more positive attitudes judged the obese student more favorably. The results of multiple regression analyses suggest that attitudes might exert a greater influence when pre-service teachers must draw inferences to derive the judgment.

Keywords Attitudes · Anti-obesity bias · Obese students · Pre-service teachers · Student judgment

✉ Sabine Glock
glock@uni-wuppertal.de

¹ School of Education, Bergische Universität Wuppertal, Gaußstraße 20, 42119 Wuppertal, Germany

² University of Twente, Enschede, The Netherlands

³ Behavioural Science Institute, Radboud University Nijmegen, Nijmegen, The Netherlands

1 Introduction

Obese children in schools become victims of discrimination from both peers and teachers (Neumark-Sztainer et al. 2002; Warschburger 2005; Puhl and Brownell 2006) and consequently seem to perform worse than their normal-weight peers (Laitinen et al. 2002; Datar et al. 2004; Shore et al. 2008). Although obese students do not score lower on standardized achievement tests, they nevertheless earn lower grades than their normal-weight peers (MacCann and Roberts 2013). Such disadvantages might stem from negative stereotypical expectations and negative attitudes related to obesity (Puhl et al. 2015). Since obese people are perceived as lazy, unsuccessful, and unintelligent (Puhl and Brownell 2001; Puhl and Heuer 2009), negative stereotypical expectations might promote prejudice (Puhl and Heuer 2010). Prejudice is a consequence of negative attitudes toward the members of a social group (Devine 1989). Thus, negative attitudes might be pivotal in the educational setting. Hence, the aim of this study is the investigation of pre-service teachers' attitudes toward obesity and how these attitudes are related to pre-service teachers' judgments of obese students.

As previous research has mainly focused on physical education teachers, we extended the literature by concentrating on teachers from other domains. Furthermore, as stereotyping and prejudiced behavior are more likely to occur in highly demanding situations, and as in-service teachers are required to face such situations daily (van Dick and Wagner 2001; Santavirta et al. 2007), classroom situations are even more demanding for pre-service teachers (Dreyfus and Dreyfus 1986; Yagil 1998).

2 Theoretical background

Attitude theories and research differentiate between explicit and implicit attitudes. Explicit attitudes are assumed to be the result of deliberative and reflective processes (Fazio 1990; Strack and Deutsch 2004; Olson and Fazio 2009) and are thus the evaluations people report when confronted with explicit attitude measures (Gawronski et al. 2009). Explicit attitude measures mainly involve questionnaires that require introspection (Hofmann et al. 2005) and people's motivation to reflect and report on their attitudes (Greenwald et al. 2002). In response to such questionnaires, people often construct their explicit attitudes on the spot (Schwarz and Bohner 2001), particularly when they had never thought about their attitudes toward a specific issue before (Fazio et al. 1989). By contrast, implicit attitudes are suggested to be automatic evaluations (Gawronski and Bodenhausen 2006) that are activated by the mere presence of the attitude object (Fazio 2007; Olson and Fazio 2009). However, in order for the mere presence of an object to be able to activate the corresponding evaluation, the association between the object and the evaluation has to be sufficiently strong (Fazio et al. 1989; Fazio 2007). This has implications for information processing, behavior, and judgments, as automatically activated attitudes are suggested to influence such processes often without conscious

awareness (Fazio 2007). Accordingly, implicit attitude measures tap into this automaticity (De Houwer 2006; De Houwer and Moors 2007) because they elicit at least one of the four properties of automatic processes (Hofmann et al. 2005): efficiency, unconsciousness, unawareness, and a lack of intent (Bargh 1994). Hence, implicit measures are mainly based on reaction times (Wittenbrink and Schwarz 2007) and do not require introspection.

Not only do explicit and implicit attitudes result from two different processes, but they have also been suggested to influence behavior on two different levels. Implicit attitudes have been suggested to guide spontaneous, automatic behavior, while explicit attitudes have been suggested to affect controlled behavior (Fazio 1990; Olson and Fazio 2009). These processes are specified in the *Motivation and Opportunity as DEterminants (MODE)* model (Fazio 1990; Fazio and Towles-Schwen 1999; Olson and Fazio 2009). If people have the motivation and the opportunity to reflect on their behavior, behavior should be the result of explicit attitudes, social norms, and expected behavioral consequences. In this vein, the controlled path of the MODE model refers to the Theory of Reasoned Action (Ajzen and Fishbein 1973, 1980). By contrast, if people do not have the time, motivation, and opportunity to engage in such effortful reflective processes, behavior is suggested to be guided by implicit attitudes (Fazio 1990; Fazio and Towles-Schwen 1999; Olson and Fazio 2009). However, implicit and explicit attitudes usually co-occur because purely automatic or purely controlled processes are rare (Olson and Fazio 2009). In highly demanding situations where controlled processes cannot muster enough cognitive resources, automatic processes are apt to lead to stereotyping and prejudiced behavior. Teachers tend to experience their work as stressful (van Dick and Wagner 2001), and they need to manage highly demanding tasks under time pressure (Santavirta et al. 2007). Hence, particularly pre-service teachers who have not yet developed the experience that in-service teachers have already gained (Dreyfus and Dreyfus 1986; Berliner 2004) often feel stressed and overstrained (Yagil 1998).

In such highly demanding situations, attitudes and stereotypes play pivotal roles in influencing behavior toward or judgments of people who belong to particular groups. However, this influence can be reduced by the motivation to respond without prejudice. This motivation is twofold (Devine et al. 2002) as first, people might be extrinsically motivated to respond without prejudice because they strive to avoid negative responses from other people (Plant and Devine 1998). Gordijn et al. (2004) showed that this extrinsic motivation led to the suppression of negative attitudes and stereotypes but also to increases in biases after suppression. Second, people might be intrinsically motivated to respond without prejudice because they have internal norms and values that conflict with prejudice. These people consistently showed reduced biases in Gordijn et al. (2004) study. Hence, people with high intrinsic motivation have more experience in responding without prejudice (Monteith et al. 1998; Legault et al. 2009), and this in turn leads to reduced biases. Thus, knowing, training, and steering pre-service teachers' implicit and explicit attitudes as well as their motivation to respond without prejudice are vital to treating students fairly, particularly when teachers first begin working in the classroom.

3 Research findings on attitudes toward obese students

Research on attitudes toward obesity has focused on physical education teachers as they are involved in the prevention and treatment of overweight and obesity (O'Brien et al. 2007). Physical education teachers were found to see obese students as having more family problems and as less tidy, more emotional, and less likely to succeed than their normal-weight peers (Neumark-Sztainer et al. 1999). In one study, physical education teachers expected normal-weight students to have higher physical and social interaction abilities than their obese peers (Greenleaf and Weiller 2005). Furthermore, pre-service physical education teachers have been found to express strong negative explicit attitudes toward obese students (Piran 1998; Neumark-Sztainer et al. 1999; Greenleaf and Weiller 2005; O'Brien et al. 2007; Peters and Jones 2010). Although sports may be the subject that is most intuitively related to obesity, it is not the only subject that students encounter in their educational careers. In other subjects, good performance is equally important, and the teachers of these subjects may engage in stereotyping as well. Research on attitudes toward obesity suggests that elementary school principals also believe that children are largely responsible for their own obesity (Price et al. 1987), but that pre- and in-service elementary teachers have positive attitudes toward obese students (Hague and White 2005; Fontana et al. 2013).

In contrast to explicit attitude assessments, research on teachers' implicit attitudes toward obesity has relied on a paper-and-pencil version of the Implicit Association Test (Greenwald et al. 1998). O'Brien et al. (2007) found a strong anti-obesity bias in pre-service physical education teachers' implicit attitudes (O'Brien et al. 2007). This implicit bias was more pronounced when the pre-service physical education teachers were at the end of their training and was related to social dominance orientation, indicating that the teachers felt superior to obese persons. Fontana et al. (2013) also reported a strong obesity bias in the implicit attitudes of pre-service as well as in-service physical education teachers. Moreover, a strong anti-obesity bias in implicit attitudes has also been found in pre-service teachers preparing for various educational settings (Walter et al. 2013).

The results regarding explicit attitudes have been rather inconsistent as research has found negative, neutral, and positive explicit attitudes. Such results might depend in part on the sample and on the questionnaires that were administered, but it might also in part be due to social desirability because self-report measures are prone to a social desirability bias (De Houwer 2006). However, research on implicit attitudes has consistently reported negative implicit attitudes toward obesity, indicating an anti-obesity bias in the implicit attitudes of teachers.

Since explicit and implicit attitudes have been suggested to jointly contribute to behavior in most situations (Olson and Fazio 2009), we assessed explicit attitudes toward obesity as well. Moreover, as the influence of negative biases can be reduced by people's motivation to respond without prejudice (Devine et al. 2002; Gordijn et al. 2004), we were also interested in pre-service teachers' intrinsic and extrinsic motivation to respond without prejudice. Thus, the aim of our study was twofold. First, we were interested in the nature of pre-service teachers' implicit and explicit

attitudes toward obese students as well as in the nature of their motivation to control their responses for negative biases. Second, we investigated the relations between pre-service teachers' implicit and explicit cognitions and their judgments of students. We focused on the judgment dimensions that previous research had identified as being impacted by obesity: academic achievement, intelligence, social isolation, and engagement.

4 Method

4.1 Participants

Fifty-one Dutch pre-service teachers (48 female) from Radboud University of Nijmegen participated in this study. Participants were on average 21.12 years old ($SD = 6.15$). All participants were studying academic subjects; thus, no physical education teachers were included in the study. Participants' teaching experience ranged from 1 h to 470 h ($n = 29$). Participants' mean BMI was 22.65 ($SD = 2.68$). Most of the participants (88 %) had a normal weight ($BMI > 18.5$ and < 25), while 10 % of the participants were overweight ($BMI > 25$ and < 30), and 2 % indicated obesity ($BMI > 30$). However, 11 participants did not indicate their BMI. Participants received course credit for participation and additionally had the opportunity to win one of two vouchers of 20 Euros (about \$27 US) that could be used at a particular online shop.

4.2 Materials

4.2.1 Measurement of implicit attitudes

We employed an affective priming task (Fazio et al. 1995) with 7 words reflecting obesity and 7 words reflecting thinness as primes. The priming task as a measure of implicit attitudes has been shown to have predictive validity (see Fazio and Olson 2003 for an overview). The words stemmed from previous research on implicit anti-obesity bias (Vartanian et al. 2005) and have already been used to investigate physical education teachers' implicit attitudes toward obesity (Fontana et al. 2013). The 20 positive and 20 negative words we used as targets were pretested and proved to be unambiguous in valence (Glock et al. 2012; see Glock et al. 2013, for a detailed list of the positive and negative words). In the affective priming task, all primes were followed by all targets, resulting in four different trials: Obesity primes were followed by either positive or negative targets, and thinness primes were followed by either positive or negative targets. Each prime was shown for 100 ms, and after 200 ms the target appeared, resulting in a Stimulus Onset Asynchrony SOA of 300 ms, which is suggested to be optimal for affective priming tasks (Hermans et al. 2002). To estimate the internal consistency of the affective priming measure, we randomly clustered the response latencies for each trial. We subtracted the response latencies for the positive words from those for the negative words, resulting in two difference scores (one for obesity primes and one for thinness

primes). The scores for thinness primes were then subtracted from the scores for obesity primes, resulting in 20 difference scores, which were used to calculate Cronbach's $\alpha = 0.74$.

4.2.2 Measurement of explicit attitudes

In order to measure explicit attitudes toward obesity, we used a Dutch translation of the German Attitudes toward Obesity and Overweight Persons Questionnaire (Degner 2006). This questionnaire showed convergent validity (Degner 2006). We used 5 different subscales. The subscale "Dislike" consisted of 10 items ($\alpha = 0.79$). An example Dislike item is "Even though I try to suppress it: When I see a really fat person, I am disgusted." The subscale "Blame" contained 7 items such as "Overweight is usually caused by a lack of willpower" ($\alpha = 0.86$). The subscale "Health Responsibility" had 4 items such as "The high health costs that are caused by obese persons disadvantage other citizens" ($\alpha = 0.67$). "Fear of Fat" involved 3 statements such as "It would be horrible for me if I would gain weight" ($\alpha = 0.85$). The last subscale referred to "Achievement" with 5 items such as "On average, obese persons are less industrious than normal-weight persons" ($\alpha = 0.88$). Participants were required to indicate their agreement on a 7-point Likert scale ranging from 1 (*fully disagree*) to 7 (*fully agree*).

4.2.3 Measurement of the motivation to respond without prejudice

In order to measure participants' motivation to respond without prejudice, we relied on the questionnaire provided by Plant and Devine (1998). The questionnaire showed convergent and discriminant as well as predictive validity (Plant and Devine 1998). This questionnaire was adopted by Degner (2006) in order to measure the motivation to respond without prejudice toward obese persons. The subscale "Intrinsic Motivation" consisted of 5 items such as "I am personally motivated by my beliefs to be nonprejudiced toward obese persons" ($\alpha = 0.77$). The subscale "Extrinsic Motivation" also included 5 items such as "I try to hide any negative thoughts about obese persons in order to avoid negative reactions from others" ($\alpha = 0.74$). Participants indicated their agreement on a 7-point Likert scale ranging from 1 (*fully disagree*) to 7 (*fully agree*).

4.2.4 Demographic questionnaire

We compiled a demographic questionnaire to assess participants' age, gender, academic studies, and teaching experience. We added two questions regarding participants' weight and body height. Eleven participants were reluctant to provide this information.

4.2.5 Student case reports

We adapted the No. 1 in class student case report from previous research (Glock and Krolak-Schwerdt 2013) by removing the information on nationality and replacing it

with a sentence about the weight of the student. Thus, the two case reports described a male No. 1 in class student who was either of normal weight or obese. For example items, see “[Appendix](#)”.

4.3 Procedure

We designed this study as an online study and emailed potential participants the link that they could use to start the study. Email addresses were obtained from the University. In order to ensure that only pre-service teachers participated in the study, the email list was comprised of only undergraduates in education. If participants decided to participate, they could download the experiment from the Internet. Participants were then informed that this study would take about 20 min and that they should ensure that they would not be disturbed and that they could pay attention for the entire 20 min. After participants provided informed consent, the experiment began by instructing participants that they would be presented with words that would be followed by either a positive or a negative adjective. Their task was to indicate the valence of the adjective by pressing the “E” key for a negative valence and the “I” key for a positive valence. After performing 10 practice trials of the affective priming task, the 80 experimental trials were run. When participants had finished the affective priming task, the German Attitudes toward Obesity and Overweight Persons Questionnaire and the questionnaire assessing participants' motivation to respond without prejudice were administered. After this part of the study, participants were randomly allocated to two different experimental groups. One half of the pre-service teachers received the case report on the normal-weight student and the other half the one on the obese student. When participants had read the student case report, they were asked to judge the student on the dimensions of Dutch language proficiency, mathematical skills, intelligence, engagement, and social isolation on a 7-point Likert scale ranging from 1 (*low*) to 7 (*high*). Participants filled out the demographic questionnaire and left their email address in order to take part in the drawing. Then they were thanked and informed that they could contact the experimenter for debriefing.

5 Results

5.1 Implicit attitudes

Latencies above 1500 ms and below 250 ms (21.6 %) were excluded from further analyses. We submitted response latencies to a 2×2 ANOVA with Prime (obese vs. thin) and Target (positive vs. negative) as repeated-measures factors. The ANOVA yielded a significant main effect of Target, $F(1,50) = 5.66$, $p < .05$, $\eta_p^2 = 0.10$. Overall, participants responded faster to positive ($M = 792.56$, $SD = 142.88$) than to negative words ($M = 818.61$, $SD = 145.88$). Most importantly, the interaction between Prime and Target word was significant, $F(1,50) = 4.10$, $p < .05$, $\eta_p^2 = 0.08$ (see Fig. 1 for all means and standard deviations).

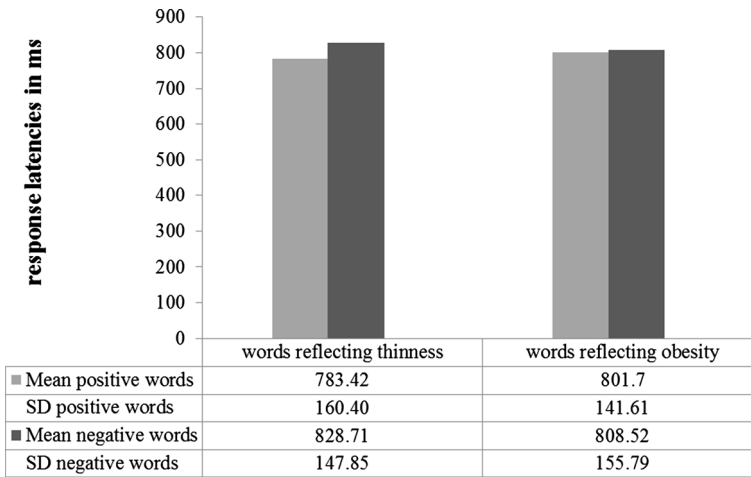


Fig. 1 Means and standard deviations of the implicit attitude measure as a function of prime and target

Simple effect tests showed that participants responded faster to positive than to negative words following thinness primes, $t(50) = 3.64$, $p < .001$, $d = 0.51$. By contrast, participants responded equally quickly to positive and negative words following obesity primes, $t(50) = 0.42$, $p = .68$, $d = 0.06$. There was no differences in response latencies for positive words following obesity versus thinness primes, $t(50) = 1.31$, $p = .20$, $d = 0.19$. Participants responded equally quickly to negative words following obesity primes and negative words following thinness primes, $t(50) = 1.71$, $p = .09$, $d = 0.24$. The main effect of Prime was not significant, $F(1,50) = 0.01$, $p = .91$, $\eta_p^2 = 0.00$.

5.2 Explicit attitudes

Participants' mean scores on the different subscales of the German Attitudes toward Obesity and Overweight Persons Questionnaire were tested against the middle of the scales (i.e. 4) in order to investigate whether participants' explicit attitudes were neutral. Participants scored neutral on the subscale "Blame" ($M = 3.87$, $SD = 1.05$), $t(50) = 0.91$, $p = .38$, $d = 0.12$. They scored neutral on the subscale "Health Responsibility" ($M = 3.78$, $SD = 0.90$), $t(50) = 1.76$, $p = .08$, $d = 0.24$, and low on "Dislike" ($M = 3.43$, $SD = 0.53$), $t(50) = 7.63$, $p < .001$, $d = 1.08$. Participants scored high on the subscale "Fear of Fat" ($M = 5.51$, $SD = 1.06$), which indicated that they would feel terrible if they would gain weight, $t(50) = 10.20$, $p < .001$, $d = 1.42$. By contrast, the subscale "Achievement" showed that participants did not believe that obese persons show a lower level of achievement than thin persons ($M = 2.59$, $SD = 1.01$), $t(50) = 9.93$, $p < .001$, $d = 1.40$.

5.3 Motivation to respond without prejudice

Compared with the neutral point on the scales (i.e. 4), participants scored high on the intrinsic motivation subscale ($M = 4.75$, $SD = 0.69$), $t(50) = 7.67$, $p < .001$, $d = 1.09$, and low on the extrinsic motivation subscale ($M = 3.34$, $SD = 1.04$), $t(50) = 4.51$, $p < .001$, $d = 0.63$.

5.4 Student judgment

Independent t -tests revealed that participants judged the obese student ($M = 6.46$, $SD = 0.60$) as scoring higher in Dutch language proficiency than the normal-weight student ($M = 5.61$, $SD = 1.34$), $t(49) = 3.05$, $p < .05$, $d = 0.82$. The obese student ($M = 6.55$, $SD = 0.91$) was also judged as having higher mathematical skills than the normal-weight student ($M = 5.82$, $SD = 1.47$), $t(49) = 2.20$, $p < .05$, $d = 0.60$. Pre-service teachers judged the obese student ($M = 1.45$, $SD = 0.99$) as less socially isolated than the normal-weight student ($M = 2.55$, $SD = 2.07$), $t(49) = 2.49$, $p < .05$, $d = 0.68$. For the engagement dimension, no difference between the obese ($M = 5.17$, $SD = 1.58$) and the normal-weight student ($M = 5.32$, $SD = 2.01$) was found, $t(49) = 0.29$, $p = .77$, $d = 0.08$. Finally, participants judged the obese student ($M = 6.72$, $SD = 0.59$) to be as intelligent as the normal-weight student ($M = 6.32$, $SD = 1.13$), $t(49) = 1.66$, $p = .10$, $d = 0.44$.

5.5 Roles of motivation to respond without prejudice and explicit and implicit attitudes in the student judgments

Table 1 shows the correlations between the explicit and implicit measures.

For the implicit attitudes, we transformed the response latencies of the affective priming task into a difference score. Positive values indicated positive implicit attitudes, and negative scores indicated negative implicit attitudes toward obesity.

Table 1 Pairwise bivariate correlations between the implicit and explicit measures

Variable	1	2	3	4	5	6	7	8	9
1 implicit attitudes	1	-0.08	-0.19	-0.14	-0.11	-0.07	0.11	0.28	0.04
2 Dislike	-0.08	1	0.58*	0.60*	0.29	0.64*	0.41*	-0.40*	-0.33
3 Health responsibility	-0.19	0.58*	1	0.73*	0.33*	0.68*	0.40*	-0.37*	0.40*
4 Blame	-0.14	0.60*	0.73*	1	0.49*	0.74*	0.22	-0.52*	-0.42*
5 Fear of fat	-0.11	0.29	0.33*	0.49*	1	0.29	0.10	-0.10	-0.34*
6 Achievement	-0.07	0.64*	0.68*	0.74*	0.29	1	0.26	-0.53*	-0.46*
7 Extrinsic motivation	0.11	0.41*	0.40*	0.22	0.10	0.26	1	-0.15	-0.26
8 Intrinsic motivation	0.28	-0.40*	-0.37*	-0.52*	-0.10	-0.53*	-0.15	1	0.17
9 BMI	0.04	-0.33	0.40*	-0.42*	-0.34*	-0.46*	-0.26	0.17	1

We calculated this score by first subtracting the response latencies for positive words from those for negative words following obesity primes. Then we performed the same calculations for thinness primes. We then subtracted the difference score for thinness primes from the one for obesity primes. As the different dimensions of the German Attitudes toward Obesity and Overweight Persons Questionnaire were not independent from each other (see Table 1 for the intercorrelations), we merged the different dimensions into a single mean score for explicit attitudes. We conducted separate multiple regression analyses using each judgment dimension as the criterion in order to investigate the predictive value of implicit and explicit attitudes as well as the internal and external motivation to respond without prejudice (see Table 2). In each multiple regression analysis, we controlled for the weight of the student (i.e. case report).

The multiple regression analyses revealed that implicit as well as explicit attitudes predicted judgments of the student's Dutch language proficiency, as participants with more positive implicit and explicit attitudes toward obesity judged the obese student more favorably. The intelligence judgments were predicted by explicit attitudes: the more positive the attitudes were, the higher the intelligence of the obese student was judged. The mathematical skills, social isolation, and engagement judgment dimensions were not predicted by attitudes. For all judgment dimensions, intrinsic and extrinsic motivation had no predictive value.

6 Discussion

In order to gain deeper insight into implicit and explicit anti-obesity bias, we investigated implicit and explicit attitudes and the role of intrinsic and extrinsic motivation to respond without prejudice in a sample of pre-service teachers. The affective priming measure we employed provided us with the opportunity to estimate implicit attitudes toward obesity as well as toward thinness. Our results revealed that, although pre-service teachers' implicit attitudes toward thinness were positive, their implicit attitudes toward obesity were neutral. As implicit attitudes are suggested to be the result of life-long experiences (Rudman 2004), the ideal of thinness and "thin is good" (Morrison et al. 2004, p 572) might be reflected in positive implicit attitudes toward thinness. This finding on the affective priming measure is in line with a previous study that showed that psychology undergraduates' implicit anti-obesity bias was due to positive implicit attitudes toward thinness (Roddy et al. 2010).

Explicit attitudes revealed a less consistent pattern as pre-service teachers showed neutral explicit attitudes regarding Blame and Health Responsibility. Explicit attitudes regarding Dislike were positive, and pre-service teachers exhibited a strong Fear of Fat. Pre-service teachers' explicit attitudes were neutral to positive, and most interestingly, they did not believe that obese people score lower on achievement than normal-weight persons. By contrast, these positive attitudes indicate that pre-service teachers believe that obese people score higher than normal-weight persons on achievement. Although obesity has been found to be linked to lower academic achievement (Laitinen et al. 2002; Datar et al. 2004; Shore et al. 2008), this is not reflected in explicit attitudes toward the achievement of obese people.

Table 2 Results of the multiple regression analyses

Criterion	Model I			Model II			Model III			Model IV		
	B	SE B	β	B	SE B	β	B	SE B	β	B	SE B	β
<i>Dutch language proficiency</i>												
Case report	0.84	0.27	0.39*	0.82	0.27	0.39*	0.91	0.27	0.43*	0.95	0.27	0.44*
Implicit attitudes	0.29	0.14	0.27*	0.28	0.13	0.26*	0.28	0.13	0.26*	0.28	0.13	0.26*
Explicit attitudes				-0.38	0.26	-0.26*	-0.41	0.21	-0.27	-0.30	0.22	-0.20
Internal motivation							-0.05	0.21	-0.03	-0.08	0.21	-0.04
External motivation										-0.19	0.14	-0.19
R ²			0.23							0.30		
<i>Mathematical skills</i>												
Case report	0.75	0.34	0.30*	0.76	0.34	0.31*	0.76	0.35	0.31*	0.78	0.35	0.32*
Implicit attitudes	-0.03	0.17	-0.02	-0.03	0.17	-0.02	-0.03	0.17	-0.02	-0.03	0.17	-0.03
Explicit attitudes				-0.14	0.34	-0.08	-0.14	0.27	-0.09	-0.09	0.29	-0.05
Internal motivation							-0.01	0.28	-0.01	-0.01	0.28	-0.01
External motivation										-0.10	0.18	-0.09
R ²			0.09							0.10		
<i>Intelligence</i>												
Case report	0.40	0.25	0.23	0.45	0.24	0.26	0.51	0.24	0.30*	0.54	0.24	0.31*
Implicit attitudes	0.08	0.12	0.10	0.08	0.12	0.09	0.10	0.12	0.11	0.10	0.12	0.11
Explicit attitudes				-0.36	0.17	-0.29*	-0.50	0.18	-0.41*	-0.43	0.19	0.35*
Internal motivation							-0.33	0.19	-0.26	-0.34	0.19	-0.27
External motivation										-0.013	0.12	-0.16
R ²			0.06							0.20		
<i>Social isolation</i>												
Case report	-1.10	0.44	-0.34*	-1.18	0.44	-0.36*	-1.08	0.43	-0.33	-1.10	0.44	-0.34*

Table 2 continued

Criterion	Model I			Model II			Model III			Model IV		
	B	SE B	β	B	SE B	β	B	SE B	β	B	SE B	β
Implicit attitudes	0.08	0.22	0.05	0.10	0.22	0.06	0.13	0.33	0.08	0.14	0.22	0.08
Explicit attitudes				0.55	0.31	0.24	0.30	0.33	0.13	0.25	0.36	0.11
Internal motivation							-0.58	0.35	-0.24	-0.57	0.35	-0.24
External motivation										0.09	0.23	0.06
R ²				0.12						0.22		
<i>Engagement</i>												
Case report	-0.14	0.50	-0.03	-0.12	0.51	-0.04	-0.15	0.52	-0.04	-0.05	0.51	-0.01
Implicit attitudes	-0.20	0.25	-0.12	-0.21	0.26	-0.12	-0.22	0.26	-0.12	-0.22	0.25	-0.13
Explicit attitudes				-0.07	0.36	-0.03	-0.01	0.40	-0.01	0.23	0.42	0.10
Internal motivation							0.15	0.42	0.06	0.12	0.41	0.05
External motivation										-0.46	0.27	-0.28
R ²				0.02						0.02		

Case report: 0 = normal-weight student, 1 = obese student, * $p < .05$

Corresponding to the MODE model (Fazio 1990; Olson and Fazio 2009), implicit and explicit attitudes should—in most situations—jointly contribute to behavior and judgments. In addition, the motivation to respond without prejudice has often turned out to be an important factor that either moderated the influence of attitudes on judgments (Dunton and Fazio 1997; Towles-Schwen and Fazio 2003) or led to stereotype suppression (Monteith et al. 1998). In particular, the intrinsic motivation to respond without prejudice has been shown to play an important role in stereotype suppression (Gordijn et al. 2004; Legault et al. 2009). Although our sample showed a high motivation to respond without prejudice, this motivation did not predict judgments or moderate the influence of attitudes on judgments. However, considering the results of the comparison between the judgments of the normal-weight and obese students, one might conclude that this effect might have been due to counterstereotypical thinking as research has shown that stereotype suppression leads to counterstereotype activation (Galinsky and Moskowitz 2007; Gawronski et al. 2008). It might be the case that people who do not have much practice in judging students use this strategy when trying to suppress stereotypes (Gawronski et al. 2008), and this might thus be independent from the intrinsic motivation to respond without prejudice.

Nonetheless, implicit as well as explicit attitudes were reflected in judgments of Dutch language proficiency as teachers with more positive attitudes judged the obese student as higher achieving. When judging the intelligence of the obese student, positive explicit attitudes predicted higher intelligence judgments. No other judgments were affected by attitudes. Thus, we need to ask why we were not able to find an influence of attitudes on all judgments. It is possible that these different judgments exhibited different processes in pre-service teachers depending on the information provided in the student case description. While the information about engagement, social isolation, and mathematical skills was addressed relatively directly (e.g. “He is a popular student who socializes with many other students”), the information about intelligence and Dutch language proficiency left more room for interpretation (e.g. “In Dutch, he scores higher than his classmates”). That is, the judgments of these dimensions had to be inferred from the description, and these dimensions were not addressed directly. Thus, it is possible that judgments that strongly rely on inferences drawn from the information are particularly influenced by attitudes as one study showed that attitudes impact trait inferences (Olson and Fazio 2004). This might be especially important in the context of student work such as essays or evaluating reading ability because different teachers might evaluate the same essay differently (Brimi 2011). Moreover, the accuracy of reading ability judgments varies greatly, in particular for low-performing students (Feinberg and Shapiro 2009). Nevertheless, this assumption warrants further investigation in future research.

6.1 Limitations

In this study, we also asked participants about their body weight and height to calculate their BMI. However, we could not use these data in our regression analyses because some of the participants did not answer these questions, and the distribution of BMI of the participants who provided this information was rather invariant. However, previous research has provided inconsistent results on the

influence of BMI on implicit attitudes. Some researchers found that BMI was related to implicit obesity bias (Degner and Wentura 2009; Phelan et al. 2014), while others did not find such a relation (O'Brien et al. 2007). What is not known so far is whether the BMI of pre-service teachers might moderate the impact of attitudes in predicting judgments. Thus, future research should investigate how the BMI of pre-service teachers contributes to their implicit and explicit attitudes and, in turn, to their judgments of students. The same holds for the teaching experience of our sample. Only half of the participants provided valid answers; thus, we were not able to control for teaching experience in our analysis. However, future research should compare expert teachers with pre-service teachers in order to investigate whether teaching experience contributes to attitudes and judgments.

Moreover, besides our study's limitations concerning the distributions of BMI and teaching experience in our sample, there are other limiting aspects that should be kept in mind. We asked our participants to indicate their implicit and explicit attitudes toward obesity but not specifically toward obese students. Thus, it is possible that pre-service teachers' implicit and explicit attitudes toward obese students do not mirror those toward obesity in general. However, previous research on anti-obesity bias has used the same procedure (e.g., O'Brien et al. 2007), and the relation between teachers' implicit attitudes toward racial minorities in general and racial minority students' academic achievement (van den Bergh et al. 2010) implies that general implicit attitudes are a valid indicator of implicit attitudes toward the "subcategory" student. Nevertheless, future research should investigate attitudes toward obese students more specifically. Providing pictures of obese students in the implicit measure and adopting the questionnaires to the specific case of obese students might help to clarify this issue. Moreover, we presented only case descriptions of male students. Research has shown that female students experience more negative effects of obesity (Needam and Crosnoe 2005; Puhl and Luedicke 2012). Hence, it seems of great importance to focus on female students and to investigate whether attitudes differentially influence judgments of male and female students.

7 Conclusions

Notwithstanding these limitations, our research provides deeper insights into implicit anti-obesity bias, explicit attitudes, the intrinsic motivation to respond without prejudice, and their roles in judgment formation. Our findings regarding obesity are encouraging since participants with more positive attitudes toward obesity judged the obese student more favorably. However, this impairs the fair treatment of all students and, thus, our findings do not negate the need to inform and train pre-service teachers to overcome the biases that result from implicit and explicit attitudes.

Compliance with Ethical Standards

Conflict of interest The authors have no competing interests.

Appendix

See Table 3.

Table 3 Translated example items (with Dutch counterparts on the right) from the case reports of an above-average and below-average student

Matthijs has an ideal weight	Matthijs heeft een ideaalgewicht
Martijn is very overweight	Martijn heeft veel overgewicht
He is interested in many things	Hij is in vele dingen geïnteresseerd
He participates a lot during the lesson	Hij participeert veel in de les
Matthijs rarely disturbs class	Matthijs verstoort de les maar zelden met zijn gedrag
On the last biology exam, he scored an A	In biologie had hij bij het laatste tentamen een 10
He follows the lesson half-heartedly	Lusteloos volgt hij de lessen
In math, he scored an F	Voor wiskunde staat hij op een 5
Martijn does not like to participate in sports	Martijn neemt niet graag deel aan de sportles
He finishes his homework with aversion and without effort	Zijn huiswerk doet hij met tegenzin en zonder inspanning

References

- Ajzen, I., & Fishbein, M. (1973). Attitudinal and normative variables as predictors of specific behavior. *Journal of Personality and Social Psychology*, 27, 41–57. doi:10.1037/h0034440.
- Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice Hall.
- Bargh, J. A. (1994). The four horsemen of automaticity: Awareness, intention, efficiency, and control in social cognition. In R. S. Wyer & T. K. Srull (Eds.), *Handbook of social cognition* (pp. 1–40). Hillsdale, NJ: Erlbaum.
- Berliner, D. C. (2004). Describing the behavior and documenting the accomplishments of expert teachers. *Bulletin of Science, Technology and Society*, 24, 200–212.
- Brimi, H. M. (2011). Reliability of grading high school work in English. *Practical Assessment, Research and Evaluation*, 16, 1–12.
- Datar, A., Sturm, R., & Magnabosco, J. L. (2004). Childhood overweight and academic performance: National study of kindergartners and first-graders. *Obesity Research*, 12, 58–68. doi:10.1038/oby.2004.9.
- De Houwer, J. (2006). What are implicit measures and why are we using them? In R. W. Wiers & A. W. Stacy (Eds.), *Handbook of implicit cognition and addiction* (pp. 11–28). Thousand Oaks, CA: Sage Publisher.
- De Houwer, J., & Moors, A. (2007). How to define and examine the implicitness of implicit measures. In B. Wittenbrink & N. Schwarz (Eds.), *Implicit measures of attitudes: Procedures and controversies* (pp. 179–194). New York, NY: Guilford Press.
- Degner, J. (2006). *Die indirekte Erfassung von Einstellungen gegenüber übergewichtigen Menschen mit dem affektiven Priming [Indirect assessment of attitudes toward overweight persons with the affective priming]*. Kassel, Germany: University Press.
- Degner, J., & Wentura, D. (2009). Not everybody likes the thin and despises the fat: One's weight matters in the automatic activation of weight-related social evaluations. *Social Cognition*, 27, 202–221.
- Devine, P. G. (1989). Stereotypes and prejudice: Their automatic and controlled components. *Journal of Personality and Social Psychology*, 56, 5–18. doi:10.1037//0022-3514.56.1.5.
- Devine, P. G., Plant, E. A., Amodio, D. M., Harmon-Jones, E., & Vance, S. L. (2002). The regulation of explicit and implicit race bias: The role of motivations to respond without prejudice. *Journal of Personality and Social Psychology*, 82, 835–848. doi:10.1037//0022-3514.82.5.835.

- Dreyfus, H. L., & Dreyfus, S. E. (1986). *Mind over machine: The power of human intuition and expertise in the era of computer*. Oxford, UK: Basil Blackwell.
- Dunton, B. C., & Fazio, R. H. (1997). An individual difference measure of motivation to control prejudiced reactions. *Personality and Social Psychology Bulletin*, *23*, 316–326.
- Fazio, R. H. (1990). Multiple processes by which attitudes guide behavior: The MODE model as an integrative framework. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 23, pp. 75–109). New York, NY: Academic Press.
- Fazio, R. H. (2007). Attitudes as object-evaluation associations of varying strength. *Social Cognition*, *25*, 603–637. doi:[10.1521/soco.2007.25.5.603](https://doi.org/10.1521/soco.2007.25.5.603).
- Fazio, R. H., Jackson, J. R., Dunton, B. C., & Williams, C. J. (1995). Variability in automatic activation as an unobtrusive measure of racial attitudes: A bona fide pipeline? *Journal of Personality and Social Psychology*, *69*, 1013–1027. doi:[10.1037/0022-3514.69.6.1013](https://doi.org/10.1037/0022-3514.69.6.1013).
- Fazio, R. H., & Olson, M. A. (2003). Implicit measures in social cognition research: Their meaning and use. *Annual Review of Psychology*, *54*, 297–327. doi:[10.1146/annurev.psych.54.101601.145225](https://doi.org/10.1146/annurev.psych.54.101601.145225).
- Fazio, R. H., Powell, M. C., & Williams, C. J. (1989). The role of attitude accessibility in the attitude-to-behavior process. *Journal of Consumer Research*, *16*, 280–288.
- Fazio, R. H., & Towles-Schwen, T. (1999). The MODE model of attitude-behavior processes. In S. Chaiken & Y. Trope (Eds.), *Dual process theories in social psychology* (pp. 97–116). New York, NY: Guilford Press.
- Feinberg, A. B., & Shapiro, E. S. (2009). Teacher accuracy: An examination of teacher-based judgments of students' reading with differing achievement levels. *The Journal of Educational Research*, *102*, 453–462. doi:[10.3200/JOER.102.6.453-462](https://doi.org/10.3200/JOER.102.6.453-462).
- Fontana, F. E., Furtado, O., Marston, R., Mazzardo, O., & Gallagher, J. (2013). Anti-fat bias among physical education teachers and majors. *The Physical Educator*, *70*, 15–31.
- Galinsky, A. D., & Moskowitz, G. B. (2007). Further ironies of suppression: Stereotype and counterstereotype accessibility. *Journal of Experimental Social Psychology*, *43*(5), 833–841. doi:[10.1016/j.jesp.2006.09.001](https://doi.org/10.1016/j.jesp.2006.09.001).
- Gawronski, B., & Bodenhausen, G. V. (2006). Associative and propositional processes in evaluation: An integrative review of implicit and explicit attitude change. *Psychological Bulletin*, *132*, 692–731. doi:[10.1037/0033-2909.132.5.692](https://doi.org/10.1037/0033-2909.132.5.692).
- Gawronski, B., Deutsch, R., Mbirkou, S., Seibt, B., & Strack, F. (2008). When “Just Say No” is not enough: Affirmation versus negation training and the reduction of automatic stereotype activation. *Journal of Experimental Social Psychology*, *44*, 370–377. doi:[10.1016/j.jesp.2006.12.004](https://doi.org/10.1016/j.jesp.2006.12.004).
- Gawronski, B., Strack, F., & Bodenhausen, G. V. (2009). Attitudes and cognitive consistency. In R. E. Petty, R. H. Fazio, & P. Briñol (Eds.), *Attitudes: Insights from the new implicit measures* (pp. 85–117). New York, NY: Psychology Press.
- Glock, S., Kneer, J., & Kovacs, C. (2013). Preservice teachers' implicit attitudes toward students with and without immigration background: A pilot study. *Studies in Educational Evaluation*, *39*, 204–210. doi:[10.1016/j.stueduc.2013.09.003](https://doi.org/10.1016/j.stueduc.2013.09.003).
- Glock, S., & Krolak-Schwerdt, S. (2013). Does nationality matter? The impact of stereotypical expectations on student teachers' judgments. *Social Psychology of Education*, *16*, 111–127. doi:[10.1007/s11218-012-9197-z](https://doi.org/10.1007/s11218-012-9197-z).
- Glock, S., Unz, D., & Kovacs, C. (2012). Beyond fear appeals: Contradicting positive smoking outcome expectancies to influence smokers' implicit attitudes, perception, and behavior. *Addictive Behaviors*, *37*, 548–551. doi:[10.1016/j.addbeh.2011.11.032](https://doi.org/10.1016/j.addbeh.2011.11.032).
- Gordijn, E. H., Hindriks, I., Koomen, W., Dijksterhuis, A., & Van Knippenberg, A. (2004). Consequences of stereotype suppression and internal suppression motivation: A self-regulation approach. *Personality and Social Psychology Bulletin*, *30*, 212–224. doi:[10.1177/0146167203259935](https://doi.org/10.1177/0146167203259935).
- Greenleaf, C., & Weiller, K. (2005). Perceptions of youth obesity among physical educators. *Social Psychology of Education*, *8*, 407–423. doi:[10.1007/s11218-005-0662-9](https://doi.org/10.1007/s11218-005-0662-9).
- Greenwald, A. G., Banaji, M. R., Rudman, L. A., Farnham, S. D., Nosek, B. A., & Mellott, D. S. (2002). A unified theory of implicit attitudes, stereotypes, self-esteem, and self-concept. *Psychological Review*, *109*, 3–25. doi:[10.1037/0033-295X.109.1.3](https://doi.org/10.1037/0033-295X.109.1.3).
- Greenwald, A. G., McGhee, D. E., & Schwartz, J. K. L. (1998). Measuring individual differences in implicit cognition: The implicit association test. *Journal of Personality and Social Psychology*, *74*, 1464–1480. doi:[10.1037/0022-3514.74.6.1464](https://doi.org/10.1037/0022-3514.74.6.1464).

- Hague, A. L., & White, A. A. (2005). Web-based intervention for changing attitudes of obesity among current and future teachers. *Journal of Nutrition Education and Behavior*, *37*, 58–67. doi:10.1016/S1499-4046(06)60017-1.
- Hermans, D., Vansteenwegen, D., Crombet, G., Baeyens, F., & Eelen, P. (2002). Expectancy-learning and evaluate learning in human classical conditioning: Affective priming as an indirect and unobtrusive measure of conditioned stimulus valence. *Behaviour Research and Therapy*, *40*, 217–234. doi:10.1016/S0005-7967(01)00066-7.
- Hofmann, W., Gschwendner, T., Nosek, B. A., & Schmitt, M. (2005). What moderates implicit—explicit consistency? *European Review of Social Psychology*, *16*, 335–390. doi:10.1080/10463280500443228.
- Latinen, J., Power, C., Ek, E., Sovio, U., & Järvelin, M. R. (2002). Unemployment and obesity among young adults in a northern Finland 1966 birth cohort. *International Journal of Obesity*, *26*, 1329–1338. doi:10.1038/sj.ijo.0802134.
- Legault, L., Green-Demers, I., & Eadie, A. L. (2009). When internalization leads to automatization: The role of self-determination in automatic stereotype suppression and implicit prejudice regulation. *Motivation and Emotion*, *33*, 10–24. doi:10.1007/s11031-008-9110-4.
- MacCann, C., & Roberts, R. D. (2013). Just as smart but not as successful: Obese students obtain lower school grades but equivalent test scores to nonobese students. *International Journal of Obesity*, *37*, 40–46. doi:10.1038/ijo.2012.47.
- Monteith, M. J., Sherman, J. W., & Devine, P. G. (1998). Suppression as a stereotype control strategy. *Personality and Social Psychology Review*, *2*, 63–82. doi:10.1207/s15327957pspr0201_4.
- Morrison, T. G., Kalin, R., & Morrison, M. A. (2004). Body-image evaluation and body-image investment among adolescents: A test of sociocultural and social comparison theories. *Adolescence*, *39*, 571–592.
- Needam, B. L., & Crosnoe, R. (2005). Overweight status and depressive symptoms during adolescence. *Journal of Adolescent Health*, *36*, 48–55. doi:10.1016/j.jadohealth.2003.12.015.
- Neumark-Sztainer, D., Falkner, N., Story, M., Perry, C., Hannan, P. J., & Mulert, S. (2002). Weight-teasing among adolescents: Correlations with weight status and disordered eating behaviors. *International Journal of Obesity*, *26*, 123–131. doi:10.1038/sj.ijo.0801853.
- Neumark-Sztainer, D., Story, M., & Harris, T. (1999). Beliefs and attitudes about obesity among teachers and school health care providers working with adolescents. *Journal of Nutrition Education*, *31*, 3–9. doi:10.1016/S0022-3182(99)70378-X.
- O'Brien, K. S., Hunter, J. A., & Banks, M. (2007). Implicit anti-fat bias in physical educators: Physical attributes, ideology and socialization. *International Journal of Obesity*, *31*, 308–314. doi:10.1038/sj.ijo.0803398.
- Olson, M. A., & Fazio, R. H. (2004). Trait inferences as a function of automatically activated racial attitudes and motivation to control prejudiced reactions. *Basic and Applied Social Psychology*, *26*, 1–11. doi:10.1207/s15324834basps2601_1.
- Olson, M. A., & Fazio, R. H. (2009). Implicit and explicit measures of attitudes: The perspective of the MODE model. In R. E. Petty, R. H. Fazio, & P. Briñol (Eds.), *Attitudes: Insights from the new implicit measures* (pp. 19–63). New York, NY: Psychology Press.
- Peters, D. M., & Jones, R. J. A. (2010). Future sport, exercise and physical education professionals' perceptions of the physical self of obese children. *Kinesiology*, *42*, 36–43.
- Phelan, S. M., Dovidio, J. F., Puhl, R. M., Burgess, D. J., Nelson, D. B., Yeazel, M. W., & van Ryn, M. (2014). Implicit and explicit weight bias in a national sample of 4,732 medical students: The medical student CHANGES study. *Obesity*, *22*, 1201–1208. doi:10.1002/oby.20687.
- Piran, N. (1998). A participatory approach to the prevention of eating disorders in a school. In W. Vandereycken & G. Noordenbos (Eds.), *The prevention of eating disorders* (pp. 173–186). London, UK: Athlone.
- Plant, E. A., & Devine, P. G. (1998). Internal and external motivation to respond without prejudice. *Journal of Personality and Social Psychology*, *75*, 811–832. doi:10.1037/0022-3514.75.3.811.
- Price, J. H., Desmond, S. M., & Stelzer, C. M. (1987). Elementary school principals' perceptions of childhood obesity. *Journal of School Health*, *57*, 367–370. doi:10.1111/j.1746-1561.1987.tb03225.x.
- Puhl, R. M., & Brownell, K. D. (2001). Bias, discrimination, and obesity. *Obesity Research*, *9*, 788–805. doi:10.1038/oby.2001.108.
- Puhl, R. M., & Brownell, K. D. (2006). Confronting and coping with weight stigma: An investigation of overweight and obese adults. *Obesity*, *14*, 1802–1815. doi:10.1038/oby.2006.208.

- Puhl, R. M., Brownell, K. D., & DePierre, J. A. (2015). Bias, discrimination, and obesity. In G. A. Bray & C. Bouchard (Eds.), *Handbook of obesity* (3rd ed., pp. 461–470). Boca Raton, FL: CRC Press.
- Puhl, R. M., & Heuer, C. A. (2009). The stigma of obesity: A review and update. *Obesity, 17*, 941–964. doi:10.1038/oby.2008.636.
- Puhl, R. M., & Heuer, C. A. (2010). Obesity stigma: Important considerations for public health. *American Journal of Public Health, 100*, 1019–1028. doi:10.2105/AJPH.2009.159491.
- Puhl, R. M., & Luedicke, J. (2012). Weight-based victimization among adolescents in the school setting: Emotional reactions and coping behaviors. *Journal of Youth and Adolescence, 41*, 27–40. doi:10.1007/s10964-011-9713-z.
- Roddy, S., Stewart, I., & Barnes-Holmes, D. (2010). Anti-fat, pro-slim, or both? Using two reaction-time based measures to assess implicit attitudes to the slim and overweight. *Journal of Health Psychology, 15*, 416–425. doi:10.1177/1359105309350232.
- Rudman, L. A. (2004). Sources of implicit attitudes. *Current Directions in Psychological Science, 13*, 79–82. doi:10.1111/j.0963-7214.2004.00279.x.
- Santavirta, N., Solovieva, S., & Theorell, T. (2007). The association between job strain and emotional exhaustion in a cohort of 1,028 Finnish teachers. *British Journal of Educational Psychology, 77*, 213–228. doi:10.1348/000709905X92045.
- Schwarz, N., & Bohner, G. (2001). The construction of attitudes. In A. Tesser & N. Schwarz (Eds.), *Blackwell handbook of social psychology: Intraindividual processes* (pp. 436–457). Malden, MA: Blackwell.
- Shore, S. M., Sachs, M. L., Lidicker, J. R., Brett, S. N., Wright, A. R., & Libonati, J. R. (2008). Decreased scholastic achievement in overweight middle school students. *Obesity, 16*, 1535–1538. doi:10.1038/oby.2008.254.
- Strack, F., & Deutsch, R. (2004). Reflective and impulsive determinants of social behavior. *Personality and Social Psychology Review, 8*, 220–247. doi:10.1207/s15327957pspr0803_1.
- Towles-Schwen, T., & Fazio, R. H. (2003). Choosing social situations: The relation between automatically activated racial attitudes and anticipated comfort interacting with African Americans. *Personality and Social Psychology Bulletin, 29*, 170–182. doi:10.1177/0146167202239042.
- Van den Bergh, L., Denessen, E., Hornstra, L., Voeten, M., & Holland, R. W. (2010). The implicit prejudiced attitudes of teachers: Relations to teacher expectations and the ethnic achievement gap. *American Educational Research Journal, 47*, 497–527. doi:10.3102/0002831209353594.
- Van Dick, R., & Wagner, U. (2001). Stress and strain in teaching: A structural equation approach. *British Journal of Educational Psychology, 71*, 243–259. doi:10.1348/000709901158505.
- Vartanian, L. R., Herman, C. P., & Polivy, J. (2005). Implicit and explicit attitudes toward fatness and thinness: The role of the internalization of societal standards. *Body Image, 2*, 373–381. doi:10.1016/j.bodyim.2005.08.002.
- Walter, M. E., Ragan, K., Sulak, T. N., & Bagby, J. H. (2013). Implicit and explicit biases toward obesity: Perspectives of school of education students. *Community Medicine and Health Education, 3*, 212. doi:10.4172/2161-0711.1000212.
- Warschburger, P. (2005). The unhappy obese child. *International Journal of Obesity, 29*, S127–S129. doi:10.1038/sj.ijo.0803097.
- Wittenbrink, B., & Schwarz, N. (2007). Introduction. In B. Wittenbrink & N. Schwarz (Eds.), *Implicit measures of attitudes* (pp. 1–16). New York, NY: Guilford Press.
- Yagil, D. (1998). If anything can go wrong it will: Occupational stress among inexperienced teachers. *International Journal of Stress Management, 5*, 179–188.

Dr. Sabine Glock received her Ph.D. from the University of Saarland. After working as junior researcher at the Department of Social Psychology at the University of Saarland for 2 years, she started to work at the University of Luxembourg. Since 2014, she is a member of the School of Education at the Bergische Universität Wuppertal, Germany. She is concerned with educational psychology, particularly, with educational decision making and factors influencing educational decisions. Her main research interest is implicit cognition, particularly implicit attitudes.

Arnoud Oude Groote Beverborg is currently finishing his Ph.D. project at the University of Twente, on the longitudinal and reciprocal relations between psychological factors, workplace conditions, and

leadership, for sustained engagement in professional learning from teachers in schools. Additional to his interest in enhancing school change capacity is his fascination with how changes in meaning about oneself and one's work can result from everyday experiences over time.

Dr. Barbara C. N. Müller received her Ph.D. in 2013 from Radboud University Nijmegen. After completion of her Ph.D. she went to the Ludwig-Maximilians University in Munich to investigate the developmental aspects of Metacognition. Furthermore, her research focus is on human non-human interactions, the practical application of self-persuasion, and stereotyping. Currently, she works as an assistant professor at the Social Cognition department of the Behavioural Science Institute, Radboud University Nijmegen.