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Relevance of perceived teacher humor types for instruction and student learning

Sonja Bieg¹ · Markus Dresel¹

Abstract The use of humor is assumed to be an effective tool for teachers to promote instruction and student learning. However, research on teacher humor is not yet systematically linked to instructional research. To provide a starting point, a model of teacher humor effects is proposed that refers to a multidimensional conception with different types of humor. To test basic assumptions of the model, a cross-sectional study was conducted with 985 secondary school students from 45 classrooms who were surveyed on their perceptions of teacher humor as well as relevant dimensions of instruction and aspects of their own learning. Two-level modelling revealed substantial relations between teacher humor and instructional dimensions and student learning which varied considerably between different types of humor. Whereas humor related to course material showed positive associations, unrelated humor was negatively related with the investigated instructional dimensions. Two-level mediation analyses indicated that the associations between teacher humor and student learning were mediated by instructional dimensions.

Keywords Teacher humor · Instructional dimensions · Student learning · Student perceptions

1 Introduction

Founded on early humor research, it can be assumed that humor provides an opportunity to exert a positive influence over socio-emotional, motivational and cognitive aspects of instruction and learning (for an overview Banas et al. [2011](#)).

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However, humor is too complex to be seen as uni-dimensional—instead, teacher humor must be considered as a multidimensional concept and research has to differentiate between diverse teacher humor types (Frymier et al. 2008; Martin et al. 2003; Wanzer et al. 2010; Wanzer et al. 2006). Surprisingly, research on teacher humor is not systematically linked to current instructional research. No differentiated knowledge exists concerning the relationship between different teacher humor types, dimensions of the instructional environment, and aspects of student learning (Banas et al. 2011; Booth-Butterfield and Wanzer 2010). Prior studies either did not differentiate between different types of humor or focused exclusively on the level of the individual students and ignored both the more interesting teacher-level as well as the nested data structure (e.g., Wanzer et al. 2010). Thus, the question as to which of the different types of teacher humor generate conditions specifically conducive to student learning remains unanswered. The purpose of the present work is to propose and, preliminarily, test a conceptual model which addresses the associations between different teacher humor types, dimensions of instruction and student learning. As instructional dimensions (in terms of environmental characteristics of the classroom context that are relevant for student learning) we focus on socio-emotional, motivational and cognitive dimensions of instruction (see Hattie 2009; Hidi 1990). Correspondingly, as aspects of students' learning (in terms of intra-individual characteristics of students' learning processes) we focus on emotional, motivational and cognitive aspects (for an overview see Hall and Goetz 2013).

1.1 Definition and types of teacher humor

According to Martin (2007) humor is a broad term referring to anything that people say or do that is perceived as funny and makes others laugh. Humor involves playing with incongruities and conveys multiple meanings at once. It fulfills different functions as it helps to promote social relations with interaction partners and can be used to cope with stress and protect the self (affiliative humor types), therefore different types of humor exist (Martin et al. 2003). This multidimensional perspective of humor has also proven to be useful for teacher humor (Wanzer et al. 2006); the unique situation of instruction has revealed even more functions of humor (e.g., by way of illustration). As a result, Frymier et al. (2008) identified the following teacher humor types on which the present work is based: Humor unrelated to course material (affiliative humor that has no thematic connection to the current topic in class), self-disparaging humor (humor with which the teacher targets him/herself by doing or saying funny things at his/her own expense), humor related to course material (affiliative humor with a thematic connection to the current topic in class) and aggressive humor (hostile humor that disparages students or ridicules others).¹ Frymier et al. provided evidence from exploratory factor analyses on the level of individual student perceptions that supports differentiation among these different humor types. Bieg and Dresel (2016) confirmed that these four types are

¹ Frymier et al. (2008) further differentiates between aggressive humor and a more offensive humor type. However, this differentiation was only substantiated by explorative evidence and was not supported by Bieg and Dresel (2016).

separable, although correlated, factors of teacher humor using confirmatory factor analyses and an approach that took the nested data structure into account.

1.2 Relations to socio-emotional and motivational dimensions of instruction

Humor is often used with the intention of improving social interactions and social relationships—transmitted through positive mood and positive emotional reactions among the recipients (Ziv 1984). It has been empirically confirmed that this is effective (e.g., Kane et al. 1977; Lefcourt 2001). With the help of humor teachers can positively influence socio-emotional dimensions of instruction (i.e., instructional characteristics affecting social interactions and emotional experiences in the classroom; e.g., teacher–student relationship) and, subsequently, the actual emotional experiences of their students (Wanzer et al. 2010). For example, Stuart and Rosenfeld (1994) found among US university students that a classroom environment is experienced as pleasant and supportive when the teachers used non-hostile humor—in contrast, hostile humor was negatively related to perceptions of a friendly classroom environment. A number of other studies also have shown that affiliative instructional humor is positively related to an enjoyable learning environment and aggressive humor to an uncomfortable learning environment (Bergin 1999; Neuliep 1991; Torok et al. 2004).

Furthermore, it is suspected that teacher humor is also related to specific motivational dimensions of instruction (i.e., characteristics of the instructional environment affecting students' learning motivation). Specifically, humor can be used to build up an intriguing and diversified instruction (Bergin 1999). Instruction with a large degree of interestingness promotes situational interest on the part of the student (Krapp 2002). In turn, this should result in intrinsic motivation and enjoyment because interest-based activities are experienced positively since they support basic needs as proposed by Self-Determination Theory, and promote positive emotions (Ainley and Hidi 2015; Ryan and Deci 2000; Krapp 2002). Matarazzo et al. (2010) supported this assumption by showing that the situational interest of students for math tasks could be raised by means of humorously designed learning material. Askildson (2005) found that students showed increased levels of interest, dependent on the use of humor by the teacher. Dresel et al. (2014) supported this point, as they found that teacher humor was a positive predictor for the perceived interestingness of instruction. However, the above-mentioned studies did not differentiate among different teacher humor types.

Considering these effects, we suppose that humor represents an opportunity for teachers to create a socio-emotionally warm and motivating instruction. In particular, the affiliative humor types, which promote relationships, should therefore have positive effects on socio-emotional and motivational dimensions of instruction and, subsequently, on emotional and motivational aspects of student learning. For aggressive humor, which occurs at the expense of others, negative effects are assumed. Strati and Schmidt (2013) found that student engagement was negatively related to aggressive humor; when teachers teased or ridiculed students their engagement showed significant declines.

1.3 Relations to cognitive dimensions of instruction

One can also expect that teacher humor will have an effect on cognitive dimensions of instruction (i.e., characteristics of the instructional environment affecting students' information processing; e.g., clarity of instruction). The primary theoretical basis for this is the general attention-getting effect of humor which has been well-documented through a series of studies (overview in Banas et al. 2011). Consequently, humorous explanations or examples of the learning object can promote elaboration of the point being made since they provide unexpected, personally relevant and rich content that enhances the probability of processing the information in an elaborative manner (Petty and Cacioppo 1986; Wanzer et al. 2010). It can also be assumed that teachers provide learning aids and elaborative anchors through the use of humor, which facilitates the processing of new information (Booth-Butterfield and Wanzer 2010). According to theoretical considerations by Wanzer et al. (2010), teacher humor should result in increases in the processing of course content by students because the humorous message increases the clarity of instruction and makes content relevant. It is important to note that this should only be the case under the condition that the humorous teacher message is related to the current instructional topic.

Indications of the assumed effects on cognitive dimensions of instruction can be found in a series of experimental investigations which suggest that learning material is better remembered when it is presented humorously in comparison to a neutral form of delivery (e.g., Carlson 2011; Schmidt 2002). However, these laboratory studies generally utilized very short learning sequences (maximum one classroom period), and video-based manipulation of the humor content in the learning material. Externally more valid studies are rare. The only exceptions are quasi-experimental studies conducted by Ziv (1988a, b) in which the humor content of instruction was varied over the length of single semester courses and effects on achievement were examined. These studies also indicate that a learning effect can be attributed to humorous instruction. However, in the studies conducted by Ziv, it remains unclear which mechanism is responsible for the beneficial effect. In addition, the studies solely analyzed the effects of instruction by one or two teachers who had conducted lessons in both experimental conditions. Accordingly, the generalizability of the findings cannot be guaranteed and alternative explanations with method effects cannot be ruled out. Dresel et al. (2014) found that teacher humor predicted clarity of instruction, although a unidimensional operationalization of teacher humor was used. Further indications of the existence of associations between teacher humor and cognitive dimensions can be found in the work of Wanzer and colleagues (Wanzer and Frymier 1999; Wanzer et al. 2010), in which the humor of university teachers and its relations with the learning process were examined from the perspective of university students. The results point towards positive relationships between teacher humor and adaptive learning behaviors on the part of student, especially when the humor referenced the learning material.

1.4 Limitations of previous teacher humor research

In summary, the current state of research is characterized by several open questions and limitations. A central deficit, in our view, pertains to a lacking integration of humor research and instructional research on both the conceptual as well as the empirical level. In previous research on humor in educational contexts, instructional dimensions and teacher behavior were often, surprisingly, ignored as objects of study. So far little evidence has been reported to support well-grounded assumptions concerning humor effects on the motivational and cognitive dimensions of instruction. The field of humor research has produced few, if any, reliable statements on how different forms of teacher humor relate to established dimensions of instruction (beyond the comparatively clear findings on the socio-emotional dimensions of the teacher–student relationship). Conversely, research in the field of learning and instruction has widely ignored research on teacher humor. Consequently, the previous research on humor remains only marginally accessible for educational research.

In addition to these conceptual deficits, many of the studies on humor in instructional settings (for an overview Banas et al. 2011) were conducted two or more decades ago, and several of them focused only on the description of humor or did not differentiate between different types of humor. The few studies that have explicitly focused on teacher humor were predominantly anchored in the area of university education; here it must be noted that the humor of university teachers could differ considerably from that of teachers in primary and secondary schools (Neuliep 1991).

Moreover, these studies primarily relied on teacher self-reports, which are very susceptible to various forms of bias (e.g., self-enhancement effects resulting in positively biased reports of own instructional practices; Wubbels et al. 1992). Student perceptions of teacher humor, which are capable of overcoming these biases, were only taken into consideration in few prior studies (e.g., Wanzer et al. 2010).

1.5 A conceptual model of teacher humor effects

Taken together, the findings and considerations presented above lead one to the assumption that teachers can use certain types of humor to affect a positive influence over various aspects of their instruction and student learning. These include socio-emotional aspects (e.g., quality of the relationship between teacher and students, student enjoyment), motivational aspects (e.g., interestingness of instruction, intrinsic student motivation) and cognitive aspects (e.g., clarity of instruction, student elaboration of content material) that are well-established in instructional research (e.g., Hattie 2009).

To contribute to the advancement of the understanding of teacher humor we propose a theoretical model of teacher humor effects on instructional dimensions and aspects of student learning as is presented in Fig. 1. The model is founded on three basic assumptions. (1) We assume that teacher humor is a multidimensional construct and that several types of teacher humor exist, which have different

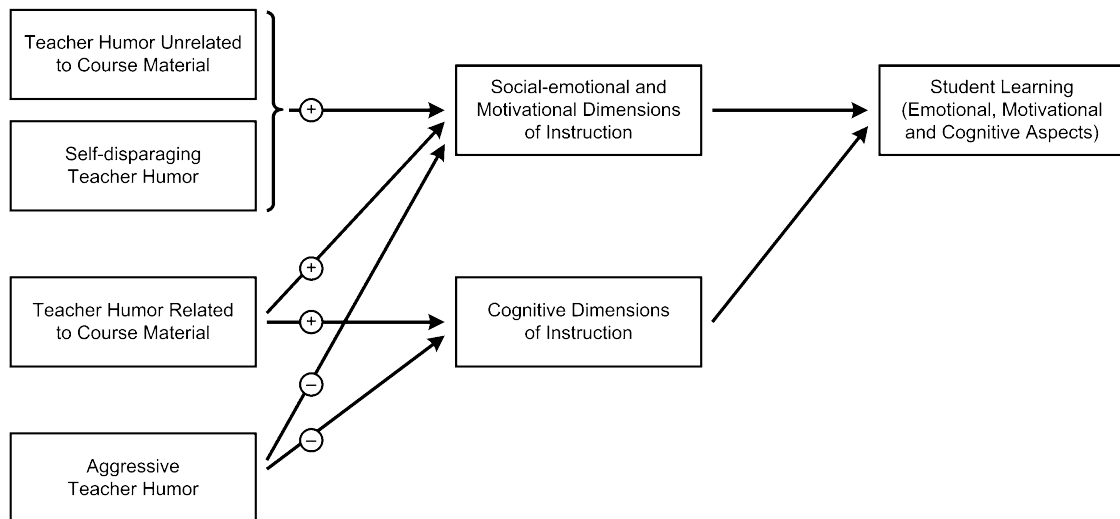


Fig. 1 Model of teacher humor effects on instructional dimensions and student learning

functions and exhibit differential effects in instructional settings. (2) We furthermore assume that there are two basic sorts of effects by humor on instruction and learning, namely social, emotional and/or motivational effects on the one hand, and cognitive effects on the other hand. (3) Finally, we assume that the effects of teacher humor on student learning are mediated through students' perceptions of instruction (see Kennedy et al. 2008; Ho 2016; Kunter et al. 2013).

From these basic assumptions, specific predictions can be made regarding the effects of each of the individual types of teacher humor (see Fig. 1). More specifically, we predict positive effects by all affiliative types of teacher humor on social, emotional and/or motivational dimensions of instruction. This is justified by the notion that by using affiliative humor a teacher can create an emotional connection with his students and will have the opportunity to keep the lesson interesting and promote student motivation (e.g., Dresel et al. 2014; Askildson 2005; Matarazzo et al. 2010; Stuart and Rosenfeld 1994). With regard to the cognitive dimensions of instruction we only predict a positive effect for teacher humor with regard to course content since this is the one humor type that can function as an attention getter and provide elaborative anchors, thus encouraging students to process information on the current topic (e.g., Booth-Butterfield and Wanzer 2010; Wanzer et al. 2010). However, we predict negative effects on all dimensions of instruction for aggressive teacher humor because this type of humor is used by teachers to enhance the self at the expense of others (specifically students), and is achieved at the cost of their social relationships with students (Stuart and Rosenfeld 1994). Moreover, it can be assumed that aggressive teacher humor deflects student attention away from the learning content and, as a consequence, hinders opportunities for developing interest in, and deeper processing of, the material at hand (Gorham and Christophel 1990; Stuart and Rosenfeld 1994). Based on extensive research on the effectiveness instruction for student learning (e.g., Hattie 2009) it is assumed that the effects of teacher humor on instructional dimensions also have consequences for students' learning processes. Since less specific assumptions are made in this respect and many indirect effects have to be

assumed here (e.g., motivational dimensions of instruction obviously not only affect students' motivation, but subsequently also their cognitive information processing), this (right-hand side) part of the proposed model is less differentiated.

2 The present study

The present study seeks to investigate different teacher humor types and their associations to relevant instructional dimensions and various aspects of student learning. Furthermore, the present study wants to gain preliminary evidence regarding the proposed model. To this end we conducted a questionnaire study with ninth and tenth grade students in the subject of German (native language for most of the students), who reported perceptions of their teachers' humor, perceptions of important dimensions of their teachers' instruction in class (teacher–student relationship, interestingness of instruction, clarity of instruction), as well as aspects of their own learning (enjoyment, intrinsic motivation, elaboration). We utilized this student perceptions approach to overcome the known limitations of teacher self-reports which were dominant in this research field (see Marsh et al. 2012).

Student perceptions can be conceptualized as resulting from a compound of the “objective” conditions in the environment (i.e., perceptual bottom-up processes) and subjective information processing, dependent on personal factors (i.e., perceptual top-down processes; Martin et al. 2011). When utilizing student perceptions, it is therefore essential to consider the nested data structure (every single teacher is perceived by many students). In accord with this distinction one has to differentiate between shared perceptions as teacher-level indicators of “objective” conditions, and individual perceptions by the single student as student-level indicators for subjective perceptual deviations from the shared perception. Although shared perceptions are frequently seen as being most relevant (Marsh et al. 2012), it is important to recognize that both perceptual components are psychologically relevant and are considered to have effects on subsequent learning (Martin et al. 2011). Specifically, with regard to the perception of teacher humor, it is important to note that schoolchildren usually, by the age of twelve at the latest, can understand quite complex humor with incongruity and linguistically ambiguous devices and thus are assumed to be capable of perceiving all relevant types of teacher humor (Bergen 1998; McGhee 1974).

We set out to test the following hypotheses derived from the proposed model.

Hypothesis 1 Affiliative humor types (humor unrelated to course material, self-disparaging humor, humor related to course material) are associated positively with socio-emotional and motivational dimensions of instruction (teacher–student relationship, interestingness of instruction), and aggressive humor is associated negatively with them.

Hypothesis 2 Humor related to course material is positively associated with cognitive dimensions of instruction (clarity of instruction), and aggressive humor is negatively associated with them.

Hypothesis 3 Affiliative humor types are associated positively with aspects of student learning (enjoyment, intrinsic motivation, elaboration) and aggressive humor is associated negatively with them.

Hypothesis 4 Associations between all types of teacher humor and aspects of student learning are mediated through dimensions of instruction.

3 Method

3.1 Sample and procedure

The sample of 985 students (47% female) was composed of 509 ninth grade students and 476 tenth grade students from 45 German language classes of 12 upper track secondary schools in Germany.² The age of the students ranged from 13 to 19 years with a mean of 16.0 years ($SD = .85$). Eight percent of the students had an immigrant background; for 4% of the students German was not the primary language spoken at home.

The sample of the present study was recruited using a two-stage procedure. In the first stage, classrooms were selected by contacting teachers leading German language classes in the ninth or tenth grades at randomly selected schools (participation was voluntary for teachers) from various German states (Bavaria, Baden-Wuerttemberg and Thuringia). We had a written approval of the Ministry of Education and local school administration respectively. In the second stage, the students of the recruited teachers were invited to participate (on a voluntary basis; written parental consent was obtained for each adolescent; participation rate was 95%). We did not assess any personal identification data of students and teachers (participating classes received a serial number).

The students completed the questionnaires during their regular German class in one session guided by trained research assistants (teachers were not present).

3.2 Measures

Student questionnaires were used for assessing their perceptions of their classroom environment (teacher humor, instructional dimensions) on the one hand, and intra-individual characteristics (aspects of their own learning) on the other. All measurements were operationalized with respect to the subject of German (as a native language). Reliability coefficients were sufficient for all measurements and can be found in Table 1. For perceptions of environmental characteristics, these include not only Cronbach's alpha but also intraclass correlations ICC1 and ICC2 (ICC1 quantifies the proportion of between teacher variance on total variance, ICC2 can be interpreted as a reliability measure of the class-mean rating, with values of .70 or above indicating good reliability; Lüdtke et al. 2006; Marsh et al. 2012).

² We examined the variances on the level of schools and found for none of the investigated constructs significant differences between schools. Thus, we did not include the school-level in our analyses.

Table 1 Descriptive statistics, reliability estimates and bivariate correlations

	M	SD	α	ICC1	ICC2	1	2	3	4	5	6	7	8	9
<i>Students' perceptions of teacher humor</i>														
1. Unrelated to course material	1.64	.73	.82	.29*	.89									
2. Self-disparaging	1.92	.83	.81	.25*	.87	.37*								
3. Related to course material	2.36	.93	.93	.47*	.95	.37*	.50*							
4. Aggressive	1.63	.83	.84	.30*	.90	.35*	.14*	.11*						
<i>Students' perceptions of instruction</i>														
5. Teacher-student relationship	3.74	1.02	.91	.41*	.93	.10*	.41*	.60*	-.24*					
6. Interestingness of instruction	2.68	.84	.90	.29*	.89	.13*	.39*	.62*	-.04	.68*				
7. Clarity of instruction	3.46	.91	.86	.27*	.88	.03	.29*	.47*	-.14*	.63*	.66*			
<i>Aspects of student learning</i>														
8. Enjoyment	3.04	1.21	.87	.16*	—	.03	.22*	.43*	-.11*	.47*	.55*	.51*		
9. Intrinsic motivation	2.04	.73	.86	.06*	—	.01	.15*	.28*	-.08*	.36*	.44*	.41*	.71*	
10. Elaboration	2.65	.70	.87	.07*	—	.03	.18*	.32*	-.01	.39*	.50*	.42*	.52*	.55*

N = 985 students from 45 classrooms

**p* < .05

Students' perceptions of *teacher humor* were assessed with a measure developed by Bieg and Dresel (2016) based on work by Frymier et al. (2008). It consists of 17 items and includes four subscales referring to the types of teacher humor addressed in the present work. Teacher humor unrelated to course material was assessed with three items (sample item: "Our German language teacher tells jokes unrelated to course content"), self-disparaging teacher humor with four items ("Our German language teacher makes fun of himself in class"), teacher humor related to course material with six items ("Our German language teacher uses humor related to course material") and aggressive teacher humor with four items ("Our German language teacher teases students in class about their intelligence"). All items were rated on Likert type scales, ranging from 1 (*never*) to 5 (*very often*).

Students' perceptions of *instructional dimensions* were measured through well-established scales that focus on the instructional practices of the teacher. In order to assess *teacher–student relationship* we used a scale with eight items developed by von Saldern and Littig (1987). The scale measures students' perceptions of teachers' care, i.e., to what extent students experience their teacher as supportive and cooperative ("If a student would like to discuss something with the German language teacher, then he makes time for it"). Students responded on Likert type scales, ranging from 1 (*absolutely false*) to 6 (*absolutely true*). Students' perceptions of *interestingness of instruction* were assessed with a six-item scale developed by Ditton and Merz (1999) pertaining to the extent the teacher makes class interesting and relevant ("Our German language teacher gives us interesting assignments"). Student responses were assessed along Likert type scales, ranging from 1 (*never*) to 5 (*always*). Students' perceptions of *clarity of instruction* were assessed with a three-item scale which was used in the COACTIV study (Baumert et al. 2008). The scale measures the perceived comprehensibility of explanations in class ("Our German language teacher expresses himself clearly in class"). Students' responses were assessed by using Likert type scales, ranging from 1 (*never*) to 5 (*always*).

Student reports of their own emotional experiences, motivation and cognitive processing were used to assess relevant intra-individual *aspects of student learning*. A three-item measure of *enjoyment* was taken from the Achievement Emotions Questionnaire by Pekrun et al. (2005). It refers to the enjoyment students may experience before and during class ("I enjoy my German class"). All items were presented with Likert type scales, ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). Four items taken from the motivational self-regulation questionnaire for adolescents (Bieg et al. 2011) were used to assess *intrinsic motivation* among the students during class ("In German class I learn because I like it"). Students responded on Likert type scales, ranging from 1 (*not at all true*) to 4 (*very true*). In order to obtain information on cognitive processes we assessed *elaboration* strategies with an extended version of the learning indicator scale by Wanzer and Frymier (1999). The scale instruction was "How often do you do/experience the following things in German class?", followed by eight items assessing elaboration strategies that students may engage when involved in a learning process ("I see the connections between the content in this class with the content in other classes"). Students were asked how frequently they perform each of the behaviors using Likert type scales, ranging from 1 (*never*) to 5 (*very often*).

3.3 Analyses and missing data

Due to the nested data structure we conducted two-level modeling with random intercepts using HLM (Raudenbush et al. 2011). Individual student perceptions and student characteristics were analyzed at the student-level and shared perceptions at the teacher-level. Shared perceptions at the teacher-level as “objective” indicators of teacher humor and instruction were aggregated by averaging all pertaining student perceptions. Predictors on teacher-level were grand-mean centered and individual perceptions at the student-level were group-mean centered. This type of centering is most appropriate when both teacher- and student-level effects are simultaneously tested. The group-mean centered variable represents how much an individual student’s score deviates from the average score of his or her class (MacKinnon 2008). All variables were z-standardized prior to analyses. We considered results on the teacher-level as mainly relevant for hypothesis acceptance or rejection (Marsh et al. 2012) because on this level we obtain general information about the learning environment which are important for questions according to teaching quality; results on the student-level are also important since they are of additional relevance for individual learning, emotion and motivation (Martin et al. 2011). Thus results on both levels are interpreted.

To avoid biased estimates that can result from deleting cases with missing values due to item non-response, we imputed missing values (no single item more than 5%) using expectation maximization algorithm (Peugh and Enders 2004).

4 Results

Descriptive statistics and bivariate correlations are presented in Table 1. ICC1 varied between 6% (intrinsic motivation) and 47% (humor related to course material)—reflecting partly large differences between classrooms with regard to the variables included in the present study.

4.1 Teacher humor and socio-emotional and motivational dimensions of instruction

To test Hypothesis 1 regarding the associations between different types of humor and socio-emotional and motivational dimensions of instruction, two-level models were estimated in which shared perceptions of teacher humor were inserted as predictors on the teacher-level and individually deviating perceptions of teacher humor were inserted as predictors on the student-level. Separate models were estimated for student perceptions of both, teacher–student relationship and interestingness of instruction (Table 2).

In accordance with Hypothesis 1 the quality of the teacher–student relationship was predicted positively by shared perceptions of self-disparaging teacher humor as well as teacher humor related to course material, and was negatively predicted by shared perceptions of aggressive teacher humor. Moreover, interestingness of instruction was predicted by shared perceptions of teacher humor related to course

Table 2 Two-level prediction of instructional dimensions from students' perceptions of teacher humor

Teacher humor	Instructional dimensions		
	Teacher–student relationship	Interestingness of instruction	Clarity of instruction
<i>Level 2 (teacher-level)</i>			
Unrelated to course material	– .08 (.05)	– .16* (.06)	– .25* (.07)
Self-disparaging	.15* (.06)	.10 (.06)	.11 (.07)
Related to course material	.51* (.06)	.51* (.06)	.50* (.08)
Aggressive	– .31* (.04)	– .08 (.05)	– .09 (.05)
<i>Level 1 (student-level)</i>			
Unrelated to course material	– .09 (.04)	– .09 (.03)	– .07 (.03)
Self-disparaging	.12* (.03)	.12* (.03)	.07 (.04)
Related to course material	.48* (.04)	.55* (.04)	.38* (.04)
Aggressive	– .18* (.03)	– .06 (.04)	– .15* (.04)
R^2_{Between}	.79	.70	.65
R^2_{Within}	.52	.42	.30

All variables were *z*-standardized prior to analyses. Predictors on between-level were grand-mean centered and predictors on within-level were group-mean centered. Presented are regression coefficients and standard errors (in parentheses)

* $p < .05$

material (positively) and aggressive teacher humor (negatively). The associations were particularly strong for teacher humor related to course material and the proportions of explained between-teacher variance were generally high. However, teacher humor unrelated to course material did not predict the socio-emotional dimensions and was a negative predictor for interestingness of instruction—despite positive bivariate correlations (cf. Table 1). On the student-level we found similarly that both, teacher–student relationship and interestingness of instruction were predicted positively by self-disparaging teacher humor and humor related to course material. Moreover, particularly strong individual perceptions of aggressive teacher humor predicted individually strong negative perceptions of the teacher–student relationship.

4.2 Teacher humor and cognitive dimensions of instruction

We estimated an analogous two-level model with perceived clarity of instruction as dependent variable to test Hypothesis 2 regarding the associations between teacher humor and cognitive dimensions of instruction (see Table 2).

As expected, clarity of instruction was positively predicted by teacher humor related to course material on both, the teacher-level and the student-level. However,

it was predicted by aggressive teacher humor as expected only on the student-level, resulting in partial support for Hypothesis 2. Again, humor related to course material had quite strong associations and the proportions of explained variance were rather large. Additionally, we found that clarity of instruction was not predicted by self-disparaging humor and students' shared perceptions of teacher humor unrelated to course material was negatively associated with clarity of instruction after controlling for other types of teacher humor.

4.3 Teacher humor and aspects of student learning

To test Hypothesis 3 focusing on associations between teacher humor and emotional, motivational and cognitive aspects of student learning, again two-level models were estimated (see Table 3).

Teacher humor related to course material was a strong positive predictor for all aspects of student learning on both levels. Additionally, aggressive humor was a negative predictor for enjoyment and intrinsic motivation on the student-level. Self-disparaging teacher humor was not a predictor for student learning on either the teacher-level or the student-level. Finally, teacher humor unrelated to course material was not a significant predictor on the student-level but a negative predictor for all aspects of student learning on the teacher-level. Hypothesis 3 was thus supported primarily for humor related to course material and aggressive humor. Considerable proportions of variance for emotional, motivational and cognitive

Table 3 Two-level prediction of student learning from students' perceptions of teacher humor

Teacher humor	Student learning		
	Enjoyment	Intrinsic motivation	Elaboration
<i>Level 2 (teacher-level)</i>			
Unrelated to course material	– .15* (.06)	– .15* (.05)	– .17* (.06)
Self-disparaging	.04 (.06)	– .03 (.06)	.04 (.05)
Related to course material	.36* (.07)	.25* (.05)	.24* (.06)
Aggressive	– .04 (.04)	– .03 (.04)	.01 (.04)
<i>Level 1 (student-level)</i>			
Unrelated to course material	– .07 (.04)	– .02 (.05)	– .04 (.04)
Self-disparaging	.05 (.04)	.06 (.05)	.05 (.04)
Related to course material	.44* (.05)	.36* (.05)	.40* (.05)
Aggressive	– .16* (.04)	– .10* (.04)	– .02 (.04)
R^2_{Between}	.42	.27	.33
R^2_{Within}	.20	.11	.12

All variables were *z*-standardized prior to analyses. Predictors on between-level were grand-mean centered and predictors on within-level were group-mean centered. Presented are regression coefficients and standard errors (in parentheses)

* $p < .05$

aspects of student learning could be explained through students' shared and individual perceptions of teacher humor.

4.4 Mediation of the relationships between teacher humor and student learning

To address the mediational assumption of Hypothesis 4 we conducted two-level mediation tests based on products of the relevant regression coefficients using Sobel *z*-statistics as it is the most common test and powerful when the sample size is large enough (larger than $N = 667$ *sensu* Fritz and MacKinnon 2007). This testing procedure was applied to constellations of types of teacher humor and aspects of student learning that proved to be associated significantly in the previous analyses (see Table 3). We incorporated instructional dimensions that could be predicted significantly from teacher humor as potential mediators. The results of these analyses are displayed in Fig. 2.³

Mediation testing revealed that, on the teacher-level, the association between teacher humor related to course material and student enjoyment was mediated by clarity of instruction, its association with student intrinsic motivation was mediated by both interestingness of instruction and clarity of instruction, and its association with student elaboration was mediated by interestingness of instruction. Mediation testing on the teacher-level also indicated that the negative associations between unrelated teacher humor and student enjoyment and intrinsic motivation were mediated by clarity of instruction. The association between unrelated teacher humor and student elaboration was also mediated by interestingness of instruction. Mediation testing on the student-level indicated that the associations of perceived teacher humor related to course material with enjoyment, intrinsic motivation and elaboration were mediated by perceptions of all three instructional dimensions. Finally, the associations between aggressive humor and student enjoyment and intrinsic motivation were mediated by teacher–student relationship and clarity of instruction. In sum, the mediational Hypothesis 4 was supported for nearly all identified associations between teacher humor and student learning.

5 Discussion

The main purpose of the present work was to systematically address the differential associations of different teacher humor types with instructional dimensions and aspects of student learning, also in order to contribute to a connection between humor research and current instructional research. We proposed a model of teacher humor effects that may function as a bridge between these two fields that have, surprisingly, not yet been linked to one another. The cross-sectional evidence presented may function as a starting point for more detailed empirical analyses.

³ The coefficients for regressing instructional dimensions on teacher humor were drawn from the previous analyses (see Table 3). Coefficients for regressing student learning on instructional dimensions stem from an extended model including both, teacher humor and instructional dimensions as predictors.

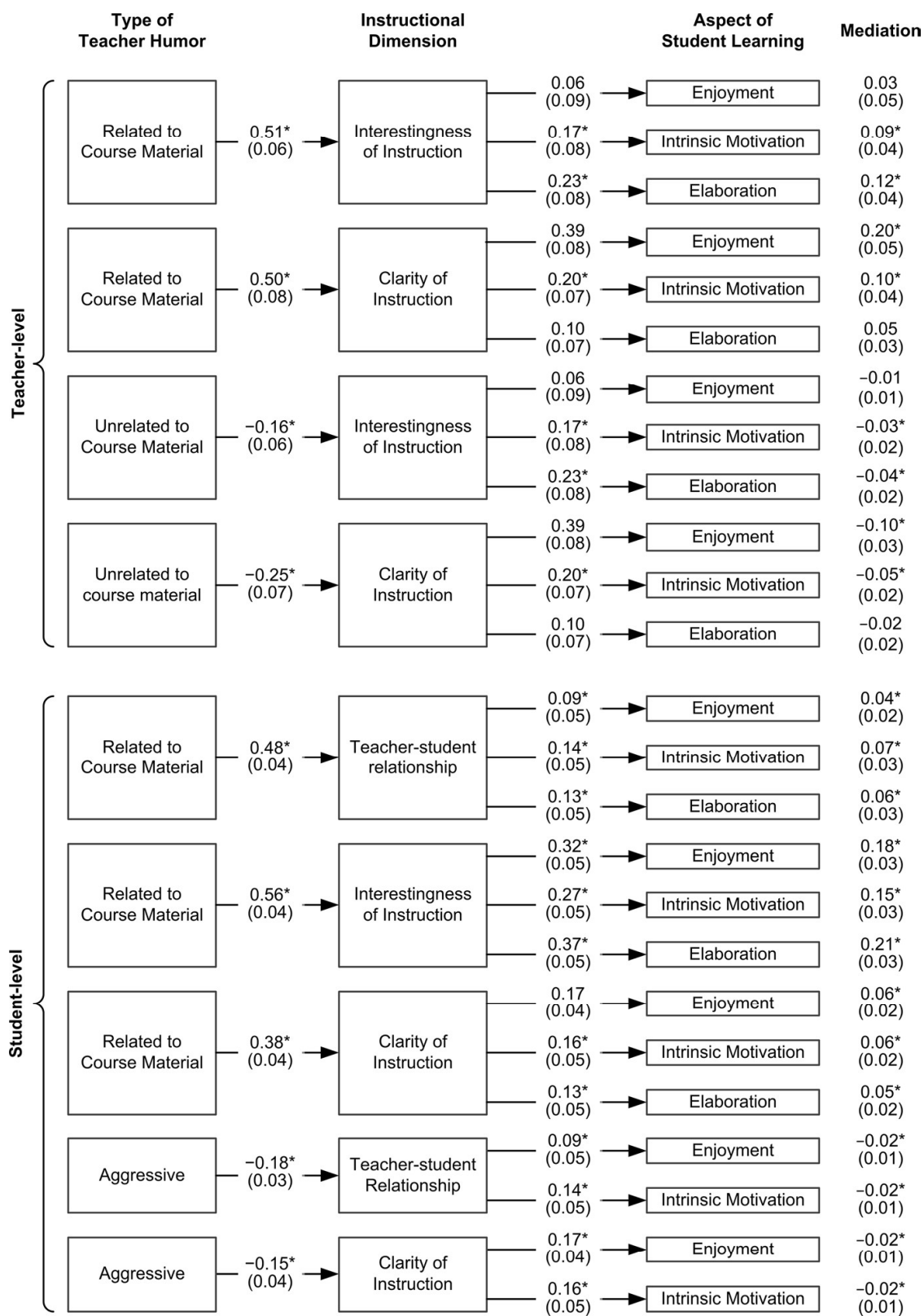


Fig. 2 Mediation of relationships between teacher humor and student learning

Further strengths of the present research, which supplemented previous studies, are the application of a multidimensional conceptualization of teacher humor, the incorporation of socio-emotional, motivational and cognitive aspects of instruction

and corresponding aspects of student learning that are well-established in educational research, the use of students' perceptions of teacher and instructional dimensions in order to surmount limitations evident on teacher self-reports, and consideration of the hierarchical structure of the data.

As assumed, the results are in line with the assumption that different humor types have different functions in the context of classroom instruction (Frymier et al. 2008; Wanzer et al. 2010).

The affiliative humor types of self-disparaging humor and humor related to course material were mostly positively associated with socio-emotional and motivational dimensions of instruction (Hypothesis 1). This indicates that affiliative teacher humor (particularly, humor that is related to course content) can fulfill important social and motivational functions of instruction (Klauer 1985). In line with our assumptions aggressive teacher humor was clearly dysfunctional in the context of instruction (Stuart and Rosenfeld 1994). It may be that when teachers use aggressive humor students feel hurt, which results in an atmosphere of alienation in the classroom. This finding is of serious importance because it contradicts the assumption associated with a unidimensional conceptualization that humor is universally functional (Wanzer et al. 2010).

We also found evidence for associations with cognitive dimensions of instruction (Hypothesis 2). Teacher humor related to course content was positively associated with the clarity of instruction with remarkable large effects. These results are in line with our assumption that teacher humor also has the potential to help promote the cognitive functions of teaching (Klauer 1985). Most importantly, this is exclusively the case for humor with a thematic connection to the current topic in class. Teachers can use this type of humor to focus their students' attention, to offer easy-to-remember illustrations and clarifications, and to emphasize anchors for elaborating the content at hand. It would be interesting for future research to analyze whether this content-related humor has the potential to help students with learning problems to understand the material better or to support cognitive activation of the students. Again, indications were found that aggressive teacher humor is dysfunctional. One can hypothesize that through aggressive humor the individual student may become annoyed which then reduces his or her ability to process content information (Wanzer et al. 2010).

With regard to the associations between the different teacher humor types and student learning (Hypothesis 3), we provided evidence that teacher humor, when it is related to course material, is positively associated with student enjoyment, their intrinsic motivation for the subject matter and their use of elaboration strategies. Contrarily, when a student perceives the humor of his or her teacher as aggressive, the student reports less enjoyment and less intrinsic motivation. These results are in line with assumptions that course related teacher humor can be of significant relevance, not only for perceptions in the classroom context, but also for student learning in a narrower sense (cf. Ziv 1988a, b).

In contrast to the widely expected results for humor related to course material, self-disparaging humor and aggressive humor, our results for teacher humor unrelated to course material were not in line with our predictions. Referencing prior work by Martin et al. (2003) and Frymier et al. (2008), we considered this type as

affiliative humor as it is focused on social relationships and is not disparaging *per se*. As unrelated teacher humor showed almost consistently negative associations on teacher-level, it is possible that incoherent jokes and stories lead to confusion and cause the central theme of instruction to get lost. Remarkably, the negative associations with instructional dimensions were only evident after controlling for other types of teacher humor, but not for the bivariate associations where some positive, albeit small, or no correlations were found. After controlling for teachers' general sense of humor, which is also included in other humor types, a proportion of teacher humor is present that is unrelated to both the course material and the teacher him/herself. This residual portion of teacher humor obviously fulfills neither a content-related function, nor a relationship-related function above and beyond the functions fulfilled by other types of teacher humor. Moreover, it may well be the case that students in the examined age group are not interested in personal anecdotes of teachers, and see humor unrelated to course material as a poor attempt to be funny and to connect with them (Dobransky and Frymier 2004). It is conceivable that younger students and children evaluate unrelated humor more positively because they are more interested in the teacher as a person and like to listen to stories.

In line with our theoretical predictions, all associations between teacher humor and student learning were mediated by instructional dimensions (Hypothesis 4). This can be interpreted under two theoretical perspectives. First, a teacher's humor can be considered to be a part of their personality (e.g., Ho 2016; Kennedy et al. 2008), which predisposes the teacher to certain more or less effective instructional practices that, in turn, affect their students' learning processes (e.g., a strong sense of humor helps teachers build up an intriguing and diversified instruction, this promotes students' intrinsic motivation). Second, teachers' use of humor can be considered as quite specific instructional practices which contribute (similar to other specific instructional practices such as providing examples or verbalizing personal relevance) to the establishment of broader instructional dimensions that, in turn, affect students' learning processes (e.g., Kunter et al. 2013).

Overall, many of the present findings are in line with the proposed theoretical model and the assumptions underlying this model. Thus the notion that different types of teacher humor fulfill different instructional and personal functions seems reasonable. Moreover, our findings were also in line with the assumption that the socio-emotional and motivational effects of teacher humor have to be distinguished from the cognitive effects of teacher humor. Here, the critical comparison was between self-disparaging humor and humor related to course material—while the former was only associated with socio-emotional and motivational dimensions of instruction, the latter was additionally associated with cognitive dimensions of instruction. A concrete relation between humor and the current teaching subject thus seems to be an indispensable prerequisite for effects on cognitive dimensions of instruction. Finally, the results for the characteristics of student learning are consistent with the theoretical assumption that teacher humor does not have unique (until now unknown) effects on student learning, but can help teachers to establish an effective instruction which, in turn, positively affects student learning processes. It is important to emphasize that the utilization of this form of humor by teachers

should not be interpreted as a necessary or sufficient condition for effective instruction.

5.1 Limitations

Although some of the significant limitations evident in prior studies could be resolved, some limitations in the present empirical study need to be mentioned. Here it is critical to note that the design was cross-sectional. Thus, it does not justify drawing causal interpretations and potential alternative explanations for the associations found (e.g., a halo effect of positive evaluation) cannot be ruled out. Consequently, the next step would be to strengthen the postulated theoretical assumptions through a longitudinal and/or experimental approach.

The practice of compiling shared students' perceptions to measure teacher characteristics is a common method used to rule out biases associated with teacher self-reports (Marsh et al. 2012) and a strength of the present work. It would be nevertheless fruitful to complement the student perspective on teachers and their instruction with additional perspectives, specifically video-based observations of classroom interactions or a multitrait-multimethod design, with various data sources to have more objective measures (Fauth et al. 2014). Nevertheless, since the evaluation of the instructional dimensions examined in the present study affords low pedagogical knowledge, students' perceptions could be regarded as especially valid (e.g., Clausen 2002).

Moreover, one needs to consider that only ninth and tenth grade students in the subject of native language learning were analyzed—thus, it remains unclear how directly the present results can be applied to other subject and other student populations, especially younger students (Wanzer et al. 2010). Because children's incongruity-detecting adeptness increases rapidly around the age of seven (McGhee 1974) it seems nonetheless possible that the present results are valid for the later primary school years.

5.2 Conclusions

From the present work it can be concluded that a differentiated perspective of teacher humor that encompasses several types of humor is strongly advised. The basic assumption that different types of teacher humor have different associations with instructional dimensions and student learning stood fast in the empirical investigation (although it could not be tested in a causal sense). From a practical point of view, it seems possible to promote essential instructional dimensions especially through the use of content related humor. As the appropriate use of humor can also be regarded as an aspect of professional competence of teachers, it seems reasonable to assume that it may be learnable (Kunter et al. 2013). Future research should therefore address the development and evaluation of teacher training approaches to foster an appropriate and effective use of humor in classroom instruction.

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