

Knowledge transfer or social competence? A comparison of German and Canadian adolescent students on their socio-motivational relationships in school

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Abstract

This cross-national study investigates the perception of the impact of students' relationships towards teachers and peers on scholastic motivation in a total sample of 1477 seventh and eighth grade German ($N = 1088$) and Canadian ($N = 389$) secondary school students. By applying Multigroup Confirmatory Latent Class Analysis in Mplus we confirmed four different motivation types: (1) teacher-dependent; (2) peer-dependent; (3) teacher-and-peer-dependent; (4) teacher-and-peer-independent motivation types in Québec, Canada, as they were found in a preliminary study among German students in the state of Brandenburg (Raufelder, Jagenow, Drury, & Hoferichter, 2013). However, across the two samples, the class sizes varied considerable. The largest group among Canadian students was composed of teacher-and-peer-dependent students, followed by teacher-and-peer-independent students, while the largest group among German students was composed of peer-dependent students, followed by teacher-and-peer-independent students. In both settings the teacher-dependent motivation type constituted the smallest group. These results manifest the different impacts of social environmental variables on the motivation of German and Canadian students, having practical implications for school psychologists and educators in general.

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Keywords

Canada, Germany, motivation, Multigroup Confirmatory Latent Class Analysis, social relationships in school

Classroom settings function not only as educational arenas but also as a powerful social environment dominated by interactions between students and teachers (Anderson, Christenson, Sinclair, & Lehr, 2004; Harter, 1996; Roeser, Eccles, & Sameroff, 2000). Social interactions within the school context affect different academic factors including students' motivation (Brekelmanns & Wubbels, 1991; Burack et al., 2013; Juvonen & Wentzel, 1996; Studsrød & Bru, 2012; Wentzel, Battle, Russel, & Looney 2010; Wubbels & Brekelmanns, 2005). Based on these premises, Raufelder et al. (2013) have described the importance of inter-individual differences concerning the role of peers and teachers for students' motivation. Through an analysis of students' scholastic motivation and social relationships with peers and teachers conducted in the state of Brandenburg, Germany, the researchers identified four different motivation types (MT) with the following distribution in percentage: Teacher-dependent MT (10%), peer-dependent MT (34%), teacher-and-peer-dependent MT (27%), and teacher-and-peer-independent MT (29%) (Raufelder et al., 2013). The results indicated that the teacher-dependent MT, the peer-dependent MT as well as the teacher-and-peer-dependent MT experience social relationships as an important source of motivation. In contrast, the motivation of the teacher-and-peer-independent MT did not appear to be dependent on social relationships meaning that, for example, teaching style, teacher's awareness of student's scholastic progress and abilities, and peer learning behavior are not essential for the motivation of students of this motivation type. These results are in line with Lerner's theory of developmental contextualism (1986, 1991, 1992, 1998), which views the individual as embedded in a social context as it interacts constantly with its environment and vice versa. In this way, adolescent life is perceived to be a multifaceted developmental system involving dynamic and reciprocal relations, while person-context relations may constitute the basic process of development (Lerner, 1986, 1991). Similar to Lerner's approach, Lewin (1951) had previously defined motivation as a function of both, the person *and* the social setting (see Rheinberg, Vollmeyer, & Burns, 2000).

Following this person-context interdependence, we were interested in potential differences in adolescent students' perception of peers and teachers as source of motivation between Canadian and German students – two nations labeled as individualistic societies (Basabe & Ros, 2005; Triandis, 1995) but with significantly different educational systems, including different social settings (Beckmann, 2000; Graudenz & Randol, 1997; Kopp & Schmitt, 2004). In addition, this study aimed at investigating whether the four motivation types noted by Raufelder et al. (2013)

would also exist for Canadian secondary school students. The necessity for exploring cross-national differences in students' interaction has been posed by Beehr and McGrath (1992), as peers and teachers interact with each other differently within different educational systems (Bronfenbrenner, 1979; Chen, 2008; Lerner, 1991). The current study provides insight for both teachers and school psychologists concerning cross-national variations of perceived social environments related to motivation.

In the following section we will explain educational aspects of both Germany and Canada by briefly commenting on the design of the educational system as well as the role of peers and teachers.

Germany and Canada

Both societies are part of the Western world and members of the Organisation for Economic Co-operation and Development (OECD) since 1961. Looking at both countries' educational systems, a national Ministry of Education is absent, for each country is divided into states or provinces that are given sovereignty to decide on educational issues as well as procedures for implementing state-wide educational standards. However, in Germany the Kultusministerkonferenz (Conference of Ministers of Culture), which is a joint assembly of ministers of education and research, gives directives to the states by stipulating educational standards. In Canada the Council of Ministers of Education of Canada has been aiming to extend co-operations between the states since its foundation in 1967 (Wilson & Lam, 2004).

Germany

In 2012 Germany spent 5.3% of its Gross Domestic Product (GDP) on all levels of education, falling well below the average spending of OECD countries (6.2% of the GDP; OECD, 2012). When the results of the first Programme for International Student Assessment PISA survey were published in 2000, revealing mediocre-to-poor results in reading and mathematical literacy of German students, voices were raised about the quality of classroom methods and teaching techniques, including calls for quality assurance and the monitoring of schools (Döbert, 2002). The German public ascribes a rather low social status to teachers; the quality of teaching, the restrictive autonomy of teachers and the limited pedagogical mandate on educational decision-making are part of a controversial job profile (Etzold, 2000).

The focus of the educational system reflects German cultural characteristics including the orientation towards autonomy, self-control, and control of its surrounding (Kopp & Schmitt, 2004). In fact, among secondary school students the school is viewed as a platform to recognize personal needs and ideas (Graudenz & Randoll, 1997), while students wish to be respected as independent and self-sufficient individuals (Hesse, 2004). A national survey, portraying German youth,

found that the majority gave increasing importance to 'sticking out of the crowd', insisting on personal uniqueness and singularity (Fritzsche, 2000). In this sense, the ties between the individuals are loose, while everyone is expected to look after themselves and their immediate family, being responsible for school outcomes and his/her career (Hesse, 2004).

To be appreciated by teachers, 54% of German students feel that they have to demonstrate high performance, while only 31% of students feel that their teachers generally appreciate them. In the same study Graudenz and Randoll (1997) found that 14% of German secondary students feel that the competition for good grades affected their peer relationships negatively, while 70% agreed that their peers are only interested in their own scholastic progression.

The school climate in German schools is competitive and while some findings indicate that high achieving peers are not looked up to by some students (Hannover & Kühnen, 2002), other studies indicate that high achievers are honored by their peers (Horstkemper, 1995). Although there is variation among the youth, one aspect almost all students agree upon is the importance of getting along with their peers. Students are clearly oriented towards their peers when it comes to decision-making or pursuing activities (Fritzsche, 2000) as it is very important for them to have good friends who appreciate them (Shell, 2006). In fact, students long for appreciation from peers to a high degree (Hesse, 2004; Levitt, 2005). Furthermore, various students view the scholastic performance of their peers (no matter whether high or low) as incentive for their own performance (Kaufmann, 2007; Raufelder et al., 2013).

Yet, the orientation towards social relationships in school does not present the main focus of the educational system which is designed to concentrate mainly on the cognitive development of the students (Kopp & Schmitt, 2004), while precision is given priority over originality (Hesse, 2004). In line with these findings, a survey about the motives of being a teacher revealed that secondary school teachers were motivated by the subject, rather than by working with youth (Terhart, 2001). Particularly secondary school teachers tend to see themselves first as historian, philologist, mathematician, etc., rather than viewing themselves as educator or pedagogue (Beckmann, 2000). Teaching is, therefore, rated as rather impersonal as the main focus of the lesson is given to the subject matter (Beckmann, 2000; Graudenz & Randoll, 1997; Hesse, 2004). Among German parents a similar orientation concerning school was found, as 96% of parents see the primary purpose of school in acquiring knowledge (Toyama-Bialke, 2000).

The family, reflecting community values in general (Pebley, Goldman, & Rodríguez, 1996) has a considerable impact on the educational career of the child, as the social class of the family determines expectations and decision-making, concerning tracking and subsequently the educational career of their children (Büchner & Krüger, 1996; Maaz, Trautwein, Lüdtke, & Baumert, 2008; Nauck & Bertram, 2001; Stecher, 1999). In Germany, students' academic opportunities and success are highly dependent on the social origin of their family

(Bracey, 2004; Maaz, Baumert, & Trautwein, 2010; PISA Consortium, 2013; Solga & Dombrowski, 2009). The early tracking system (at the age of about 10- or 12-years-of age, depending on the state), which predetermines educational and vocational careers, promotes disparity between students from educationally deprived and privileged families. Once students follow a certain school track, only very few of all secondary school students change to a school type with a higher tracking system. For every upward change in the school tracking, five downward changes follow (Autorengruppe Bildungsberichterstattung, 2008). However, as the stratification within the German educational system has been criticized severely (Muñoz, 2007), the states are moving towards reducing the tracking system.

Canada

Canada's educational system was ranked one of the best in the 20th century and is still among the top systems according to most of the PISA scores. As assessed in PISA 2012, Canada unites high performance levels with equity in educational opportunities and therefore has been characterized as having a low-cost and high-quality educational system (Hopkins, 2013; PISA Consortium, 2013). Canada's education system is designed to be progressive and child-centered (Wilson & Lam, 2004), although there have been movements within the past years towards a teacher-directed model (Laferriere, 2001; Wilson, 1993); for example by preparing the students for vocational careers by giving fewer electives and providing obligatory core subjects. The dominant key points in Canadian education, including teacher training are defined as 'cultivation of mind, vocational preparation, moral and civil development and individual development' (Wilson & Lam, 2004, p. 23). In 2012, Canada spent 6.1% of its GDP on education, which is 0.8% more than the spending in Germany. As in many countries, in Canada the socioeconomic status (SES) is related to schooling opportunities (Ferguson, Bovaird, & Mueller, 2007; Finnie, Childs, & Wismer, 2011). However, PISA 2012 revealed a weak relationship between socioeconomic status and student performance among Canadian students. Similar results have been found in a comparative study between Australian and Canadian students, indicating that the association between socioeconomic status and students' mathematics and reading tests was stronger in Australian students than in Canadian students (Perry & McConney, 2013). While students' socioeconomic status was related to academic achievement in both countries, Canadian students performed better. This may be due to the Canadian school system, which gives much importance to social relationships and social competencies, creating a supportive environment (Wilson & Lam, 2004). The strong impact of the learning context was confirmed by Salili, Chiu, and Lai (2001), when they found that the context of learning moderated the effect of cultural influences in Chinese Canadian and European Canadian students living in Canada, influencing students' motivation and achievement.

Looking at the role of parents, in comparison with German parents, Canadian parents' involvement in educational decision-making is anchored deeply through establishments, including school boards and school advisory councils (Wilson & Lam, 2004). In addition, the development of social skills is viewed as at least as central as students' academic achievement – evaluating students' personal development and social competence is one of the key factors of education (Cheah & Chirkov, 2008).

In fact, a national survey portraying students' opinion on school issues illustrated that the cognitive engagement in school was lower than social engagement, as in most cases students did not see the relevance of schoolwork to their future (Willms, Friesen, & Milton, 2009). Comparative studies with countries such as Spain and Cuba have shown that particularly Canadian students value social support from friends at school, which was related to high levels of intrinsic academic motivation (Vitoroulis et al., 2012). Following an individual perspective, a Canadian study found three different profiles of students on the basis of school adjustment and social relationships during the transition to middle school (Duchesne, Ratelle, & Roy, 2012). Although all three groups (well-adjusted, socio-emotionally adjusted, socially adjusted) evaluated their peer and teacher relationships to be satisfactory, their school adjustment and coping with school demands varied among the groups, indicating that the perception of social relationships may have different impact on school variables.

Results from the PISA (2000, 2003, 2006, 2009, 2012) showed that Canadian participants scored well above the OECD-average in reading, mathematics and science, while on a national level Québec ranked first in mathematics and second highest in science and reading (EQAO, 2001). National comparative studies with students aged 13- to 16-years of age have shown that Québec's students did particularly well in mathematic problem solving and reading, outperforming all other provinces (EQAO, 2000).

The high quality results of Canadian students reflected in PISA seem contradictory to their reported low cognitive engagement, while the latter constitutes a challenge for the Canadian educational system. However, being aware of student voices, Canada is subsequently focusing on subjects linked to vocational careers as part of a sustainable development (Hopkins, 2013).

Hypotheses

To sum up, German and Canadian secondary school students seem to differ in their perception of peers and teachers in the school context, which might be based on different emphases in the educational systems of both countries. German students tend to focus on peers as motivational support as well as on their individuality, whereas the relationships with teachers are described as informal and distant. This tendency is in line with the concept of the German educational system, which is dominated by knowledge transfer and impersonal teacher-student relationships as well as with the specific distribution of the motivation typology among German

students. In particular, the peer-dependent MT was found to be the largest group with 34%, followed by the teacher-and-peer-independent MT with 29%, while the teacher-dependent MT constituted the smallest group (10%) (Raufelder et al., 2013). In contrast, Canadian secondary school students tend to perceive both peers and teachers as supportive. In addition, the Canadian educational system places more emphasis on school as an important social environment by focusing on and maintaining the development of social skills.

Based on these cross-national differences among the role of peers and teachers in the educational system and the established motivational typology in Germany the following two hypotheses were developed and tested: (1) four different motivation types (MT) can be identified among Canadian students; and (2) the distribution of the students within the typology varies among the countries. In the Canadian sample, the teacher-and-peer-dependent MT is expected to be the largest group, followed by the teacher-and-peer-independent MT.

Method

Participants and procedure

A total of 1477 seventh and eighth grades students from Germany and Canada participated in this study during the school years 2011/2012. The study was conducted in the state of Brandenburg, in the northeastern part of Germany where the population is mainly German speaking. A total of 1088 German secondary students (54% girls, 46% boys) ($M_{\text{age}} = 13.7$, $SD = 0.53$, age span 12- to 15-years) answered questions about their socio-motivational relationships with peers and teachers. Schools were randomly selected with permission from the governmental Department of Education, Youth and Sport of Brandenburg.

Information about participants' socioeconomic status (SES) was not obtained, as the law in Germany does not allow asking a first party about information of a third party (e.g. asking students about the financial situation or the educational attainment of parents).

A total of 389 Canadian secondary students (55.9% girls, 42.9% boys) ($M_{\text{age}} = 13.4$, $SD = 0.80$, age span 12- to 16-years) participated in the study. About 58.2% of the students spoke primarily English at home, 29.6% spoke primarily French at home and 12.3% other languages. Due to missing values the percentages do not add up to 100% in all cases.

The Canadian students from randomly selected English schools in the Montréal region answered the same questionnaire as the German students but did so in English. Parental permission was acquired after obtaining permission from the English Montréal School Board (EMSB) and governing board of each school. Additionally, the ethics commission of the Concordia University authorized the questionnaire.

In Germany as well as in Canada parents and students were informed that the survey would be voluntarily, anonymous and confidential as they were asked for

consent. Data collection took place in classrooms or the cafeteria on two consecutive days.

Measures

Peers as Positive Motivators (PPM). This subscale is part of the Relationships and Motivation (REMO) Scale (Raufelder, Drury, Jagenow, Hoferichter, & Bukowski, 2013) and consists of nine statements such as ‘When my friends learn, I am also motivated to learn more’, or ‘My friends and I motivate each other to make an effort at school’. The subscale’s reliability in the German sample was Cronbach’s alpha (α)=0.80 and in the Canadian sample Cronbach’s α =0.83. Students answered questions on a bimodal four-point Likert scale from 1 (*strongly disagree*) to 4 (*strongly agree*).

Teachers as Positive Motivators (TPM). This subscale was also taken from the REMO Scale (Raufelder et al., 2013) and consists of six items that showed an internal consistency of α =0.78 in the German sample and α =0.76 in the Canadian sample. Students were asked to evaluate statements such as ‘I will make more of an effort in a subject when I think the teacher believes in me’, or ‘When a teacher helps me, I try to do well in the subject’ on a bimodal four-point Likert scale from 1 (*strongly disagree*) to 4 (*strongly agree*).

As the original scale was a German scale two professional translators did a Brislin back-translation (Brislin, 1970) independently from each other. Additionally, a pilot study with approximately 100 native English-speaking high school students in Germany from an international school (where the main language is English) was conducted to validate the questionnaire.

Statistical analyses

In order to examine the above-mentioned hypotheses a Multigroup Confirmatory Latent Class Analysis (MCLCA) was conducted to identify the possible four motivation types in both Canadian and German students, testing for measurement equivalence by applying an unrestricted, semi-restricted, and fully-restricted model. Furthermore, we analysed the distribution of students among the classes.

Multigroup Confirmatory Latent Class Analysis (MCLCA)

Through the application of Latent Class Analysis (LCA) it is possible to identify latent groups (subgroups) based on a set of items. Different homogeneous class specific response patterns explain underlying inter-individual differences and subsequently constitute a specific latent class (Finch & Bronk, 2011; Geiser, 2010; Hoijtink, 2001). By applying LCA it is possible to assign individuals based on their response pattern to specific latent classes and relate the number and nature of the classes to external variables such as the country (i.e. Germany, Canada)

(Eid & Lischetzke, 2013). According to Eid, Langeheine, and Diener (2003) LCA is a suitable measure in the field of cross-national research to analyse within- and between-national differences (Eid & Diener, 2001; Eid & Lischetzke, 2013). As the results of the preliminary study provide a strong *a priori* knowledge about the number and nature of the latent classes (Raufelder et al., 2013) we applied Confirmatory Latent Class Analysis (CLCA) (Eid et al., 2003; Hoijtink, 2001; Laudy, Boom, & Hoijtink, 2005). Based on *a priori* ordering restriction of four latent classes as found in Germany the application of CLCA is suitable to test specific hypothesis about the response structure in the observed variables (Finch & Bronk, 2011). Just as in the German preliminary study Raufelder et. al, 2013), parcels were built from the PPM and TPM scales and were integrated in the CLCA. Thus, the nine items from the PPM scale were transformed into three parcels with each three items (PPM1, PPM2, PPM3) and the six items from the TPM scale were transformed into three parcels with each two items (TPM1, TPM2, TPM3). Working with parcels is advantageous as the original large number of items (in this case nine and six items) is being reduced (in this case to three and three parcels), yielding stable solutions by preventing potential spurious correlations and variance sharing (Little, Cunningham, Shahar, & Widaman, 2002). Following the approach of the preliminary study (Raufelder et al., 2013) we dichotomized the parcels based on the median split, as suggested when conducting LCA in Mplus (Finch & Bronk, 2011; Geiser, 2010; Muthén & Muthén, 1998–2013). The original median split found in the German sample of 2.6 for all peer parcels (PPM1-PPM3) and 3.0 for all teacher parcels (TPM1-TPM3) was adopted for the Canadian sample. In the current sample, the requirements to apply LCA are met as the number of items is small (six parcels), the items have a small number of categories (dichotomization of the four-point Likert scale) and the sample size is large (1,477 students) (Eid et al., 2003).

In order to scrutinize potential cross-national differences concerning typological structures with country as the grouping variable, we applied a MCLCA (Eid et al., 2003; Eid & Lischetzke, 2013; Janssen & Geiser, 2012). To test for potential differences among German and Canadian students and measurement equivalence, a stepwise analysis was used by applying: (1) unrestricted models; (2) semi-restricted models; and (3) fully-restricted models which subsequently were compared on the basis of the Bayesian Information Criterion (BIC), which takes into account both the complexity of the model as well as the goodness of fit (Laudy et al., 2005; Schwarz, 1978). In various studies the BIC has been shown to be the best descriptive index concerning the evaluation of estimated models, best indicator to estimate the number of classes and in comparison to other information criteria BIC shows a consistent performance (Magidson & Vermunt, 2004; Nylund, Asparouhov, & Muthén, 2007), being superior to other fit indices (Yang, 2006).

In the first step, the unrestricted model in which all parameters are free assumes that the number of classes and their size may differ among countries, placing no restriction on the parameters whatsoever. In a second step, the semi-restricted model was applied, assuming an equal number of classes among countries,

Table 1. Bayesian Information Criteria (BIC) for multigroup confirmatory latent class analysis (MCLCA).

Classes	Unrestricted	Semi-restricted	Fully-restricted
Class 2	12708.063	12667.965	12759.708
Class 3	12471.370	12395.536	12482.931
Class 4	12427.734	12302.714	12388.745
Class 5	12504.815	12338.011	12432.882

Note: Fully-restricted-model = the conditional response probabilities as well as the class sizes are set equal across the countries; Semi-restricted model = conditional response probabilities are set equal across the countries, assuming equal number of classes, but not equal class sizes; Unrestricted model = all parameters are free across Germany and Canada.

pursuing measurement invariance. In this model the conditional response probabilities were set equal across the countries. In a third step, the fully-restricted model was applied, assuming both equal number of classes and equal class sizes across countries. In the latter model both the conditional response probabilities as well as the class size were held equal across countries (Janssen & Geiser, 2012).

We started the analysis with a two-class solution, increasing the number of classes until a good model fit (BIC) was attained (Laudy et al., 2005). The lowest value of the BIC indicates the best model fit when comparing different models. We consequently compared the BIC value of all modeled class solutions for the unrestricted, semi-restricted and fully restricted models (see Table 1).

The MCLCA models were estimated with Mplus full information maximum likelihood (FIML) to account for missing data using Mplus version 7.0 (Muthén & Muthén, 1998–2013).

Results

Multigroup Confirmatory Latent Class Analysis (MCLCA)

The analysis showed that the four-class solution of the semi-restricted model had the best model fit (BIC = 12302.715) and was superior in comparison to all other estimated models (see Table 1). This result indicates that across the German and Canadian participants the number of classes is equal (i.e. four different socio-motivational classes exist in both countries; see Figure 1). However, the semi-restricted model also indicates a variation in class sizes across countries. In Germany, of 1084 secondary students, 107 students (10%) were classified as teacher-dependent motivation type; 292 students (27%) were assigned to the teacher-and-peer-dependent motivation type; 317 students (29%) were identified as teacher-and-peer-independent motivation type; and 368 students (34%) were assigned to the peer-dependent motivation type. In Canada of 395 secondary

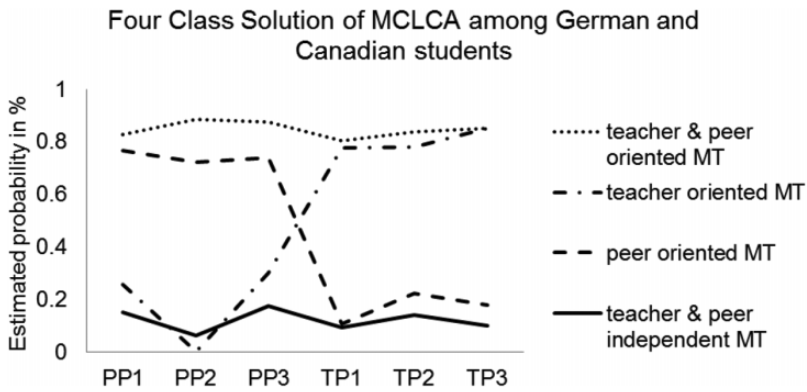


Figure 1. Confirmatory latent class analysis of socio-motivational relationships for students in Germany and Canada. X-axis shows three parcels ‘Peers as Positive Motivators’ (PP1-PP3) and three parcels ‘Teachers as Positive Motivators’ (TP1-TP3). The Y-axis shows the probability of agreement with the clusters. Note: MCLCA = Multigroup Confirmatory Latent Class Analysis.

Table 2. Class description and class size per country.

Class type	Class size			
	Germany (total = 1084)		Canada (total = 395)	
	N	%	N	%
Teacher-dependent MT	107	10	37	9
Teacher-and-peer-dependent MT	292	27	224	57
Peer-dependent MT	368	34	57	14
Teacher-and-peer-dependent MT	317	29	77	20

Note: MT = motivation type; N = total number of students assigned to a certain class; % = estimated percentage of class size.

students, 37 students (9%) were classified as teacher-dependent motivation type; 224 students (57%) were assigned to the teacher-and-peer-dependent motivation group; 77 students (20%) were assigned to the teacher-and-peer-independent group; and 57 students (14%) were assigned to the peer-dependent motivation type (see Table 2).

Discussion

We examined the importance of teachers and peers for the scholastic motivation of secondary students from Germany and Canada. These nations were selected as

because both are highly industrially developed countries which share common features concerning their orientation towards individualistic Western societies. In spite of these similarities, the emphasis of their educational systems varies as educators in Germany tend to prioritize the transfer of knowledge independent of personal relationships, while in Canada, along with cognitive skills, social competences are a key focus within the educational system. Based on these variations across Germany and Canada, strong cross-national differences in the role of peers and teachers on students' motivation have been assumed.

By using Multigroup Confirmatory Latent Class Analysis (MCLCA), we were able to confirm four different motivation types (MT) among Canadian students: (1) teacher-dependent MT; (2) peer-dependent MT; (3) teacher-and-peer-dependent MT; and (4) teacher-and-peer-independent MT. These results are in line with previous research (Raufelder, 2007; Raufelder et al., 2013; Hoferichter & Raufelder, 2014), in which inter-individual differences among students were found concerning the impact of teachers and peers on motivational patterns. The current study extends this research by addressing cross-national aspects within the motivational typology: *Although the pattern of the typology is the same in both countries, German and Canadian students differ in the distribution of the typology.* The following paragraphs will discuss each type and its distribution in both countries.

Teacher-and-peer-dependent motivation type (MT)

We found that in Canada 57% of the secondary students could be assigned to the motivational group that was oriented towards teachers *and* peers, constituting the biggest group among Canadian students, whereas in Germany this group only consisted of 27% (Raufelder et al., 2013). These results reflect the orientation of the community as well as the design of the educational system in each country. While Canadian parents, teachers, and students focus on maintaining and developing social skills (Cheah & Chirkov, 2008; Wilson & Lam, 2004), German school personnel, parents, and students focus on cognitive skills (Beckmann, 2000; Kopp & Schmitt, 2004; Terhart, 2001). Canadian parents stated that social competencies would be at least as important as the cognitive development of students, while German parents evaluated the primary purpose of schools as a means of knowledge acquisition (Toyama-Bialke, 2000). While teacher training in Canada is rather student-centered, including aspects of leadership, community, and commitment of student learning (Wilson & Lam, 2004), teacher training in Germany is more subject-based, including the promotion of a self-determined and individually oriented learning (Hesse, 2004).

Teacher-and-peer-independent motivation type (MT)

We found that 20% of the Canadian students were best assigned to the group of teacher-and-peer-independent MT. As Canada is oriented towards an

individualistic society, characterized by independence and self-determinant behavior (Basabe & Ros, 2005; Triandis, 1995), this MT constitutes the second largest group among Canadians. Among German students, 29% were assigned to this group (Raufelder et al., 2013), as Germany along with Canada is not only oriented towards an individualistic society but also emphasizes individual and self-determined learning within the educational system (Hesse, 2004), promoting once more the idea of uniqueness and singularity among German youth (Fritzsche, 2000).

Peer-dependent motivation type (MT)

Students assigned to the peer-dependent MT relate to peers as a source of motivation. In Canada, 14% of all students were assigned to this group. The reason for the rather small size of the group may be the fact that most of the Canadian students do not solely rely on peers as a motivational source but on both teachers *and* peers as represented by the large size of the group teacher-and-peer-dependent MT (57%). Among German students 34% of all participants were assigned to this MT, constituting the largest group (Raufelder et al., 2013).

The existence of the larger size of this group among German students is reflected in the results of a national survey (Shell, 2006), which found that the vast majority of students ascribe importance to peers who appreciate them. In line with these results, students orient themselves towards peers when it comes to school performance, conduct, and decision-making (Fritzsche, 2000; Kaufmann, 2007).

Teacher-dependent motivation type (MT)

In both countries, the smallest group is the teacher-dependent MT. In Canada the reason for the teacher group being so small (9%) may be that most students consider both teachers and peers as equally important for their motivation (see teacher-and-peer-dependent MT, 57%). In Germany this group may be rather smaller (10%) (Raufelder et al., 2013), as students' relationships with teachers are based on the educational material rather than the emotional support potentially to be gained from teachers (Hesse, 2004). In general, there is a contemporary orientation towards peers replacing an orientation directed towards the teacher, which was more commonplace in the past (Brown, 1990; Csikszentmihalyi & Larson, 1984; Levitt, 2005; Rohrbeck, 2003).

Conclusions

These findings indicate that besides individual perspectives and preferences, cross-national differences might be underlying factors in motivational processes. The Canadian educational school system focuses on both teachers *and* peers as essential sources of adolescent students' motivation, which is underlined by our findings that almost 60% of the Canadian students have been identified as

teacher-and-peer-dependent MT. Furthermore, the success of this motivational strategy, where socio-emotional factors and their impact on students' motivation and learning processes are considered, may be supported by the excellent PISA results of Canadian students.

The study clearly shows that the social environment, particularly a certain orientation and frame of the educational system, may be linked to specific roles assigned to peers and teachers in the motivational context across countries. Along with the theory of developmental contextualism (Lerner, 1991) and studies that point to the strong impact of learning contexts on motivation and achievement (Juvonen & Wentzel, 1996; Ryan & Patrick, 2001; Salili et al., 2001), it is striking how much impact social environmental factors have for the development of humans and their perception of themselves, peers, and teachers.

Methodological limitations exist in this study. First, the sample sizes vary considerably across the two countries. Second, as the study involves students from Montréal, Québec, the results may not be transferred to high school students from other Canadian provinces, as Québec may not be representative of Canada as a whole. Accordingly, the results obtained for students living in the state of Brandenburg are neither transferable to Germany as a whole. Third, the study relies solely on self-report measures. However, in psychological research self-report measures have been shown to be valid methods (Chan, 2009). Nevertheless, apart from paper/pencil tests further methods could be applied to validate the results gained from the current study.

Practical implications for the school context can be derived from the discovered structure and impact of motivational key factors. School psychologists should be aware of the variation of students' perceptions concerning the quality and role of peers and teachers for their individual motivational process. For example, the existence of motivational types, the specific social interconnectivity in class, the class climate, formed in part by the teachers' attitude towards and interaction with students, should be factors entering the analysis of school psychologists dealing with motivational problems of students.

The resulting effect of socio-motivational relationships on school variables may differ among students (Hoferichter, Raufelder, & Eid, 2013). When working with youth, it is important to understand that during adolescence, inter-individual differences become more pronounced, including the students' perception of themselves and others as well as the ascribed importance of school tasks (Covington & Dray, 2002; Thorkildsen, Nolen, & Fournier, 1994; Zusho & Pintrich, 2001). As shown in this study, the person-context relation varies considerably among students (Erickson, 1980; Lerner, 1998), which often results in a mismatch between students' individual needs and the actual opportunities provided in their school environment (Eccles, Lord, & Midgley, 1991; Eccles et al., 1993a; Eccles et al., 1993b). This mismatch can be mitigated by stronger sensitization of school psychologists about this issue. It is not surprising that students' scholastic motivation and school outcomes are mainly determined by the individual perception of the classroom social context that youth experiences (Ryan &

Patrick, 2001). In general, our results confirm Boekaert's postulate (2001) that there is still much to learn about individual preferences when it comes to motivational aspects.

This study contributes to the field of research on inter-individual differences in students' scholastic motivation by considering teachers and peers as essential environmental factors. Furthermore, cross-national differences were investigated among secondary school students in Germany and Canada. The identified motivation typology implies strong inter-individual and cross-national differences, which provide important evidence that motivation is based on the dynamic and reciprocal person-context relations of the individuals (Lerner, 1986, 1998, 1991). Therefore, the role peers and teachers play on students' scholastic motivation is not solely constituted by students' individual perception but also by educational aspects, such as the implicit institutional roles of both peers and teachers.

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