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The Role of Teaching Strategies in Social Acceptance and Interactions; Considering Students With Intellectual Disabilities in Inclusive Physical Education

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Including students with intellectual disabilities (ID) in primary school-based physical education (PE) is common practice. However, little is known about students' social participation in this environment and how it is related to PE teaching strategies. This multilevel study explored the relations between the teaching strategies *teaching cooperative skills* and *using individual reference norm orientation (IRNO)*, taking into consideration students' social acceptance and interactions in inclusive PE. The results showed that IRNO is positively related to social acceptance and positive interactions in inclusive PE, and the special educational need (SEN) status of children with ID moderated both relationships. Hence, IRNO helps to decrease the gap in social participation between students with and without ID. Teaching cooperative skills were also positively related to social acceptance of all children in PE, but there was no cross-level interaction for SEN status, and no relationship with positive interactions in PE. Thus, teaching cooperative skills can be seen as an inclusive PE teaching strategy that fosters social participation and the well-being of all students. This study addresses an issue relevant in many countries where inclusive school settings are prioritized. In future research on social participation, teacher, student, and class characteristics should be acknowledged.

Keywords: inclusive education, social acceptance, social interactions, physical education, intellectual disabilities, teaching strategies, individual reference norm orientation, cooperative skills

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INTRODUCTION

The main goal of the United Nations Convention on the Rights of Persons with Disabilities is "to promote, protect and ensure the full and equal enjoyment of all human rights [...] by all persons with disabilities" (United Nations, 2006, p. 4). As a result of this convention, most specifically referring to article 24, policies of many countries, including Switzerland, tend toward a more inclusive education (Koster et al., 2009; Achermann et al., 2017). In Switzerland, 2.5% of all the students in mainstream schools are provided with intensified special educational measures[1]

[1] I.e., they have SEN status.

(Bula et al., 2019). In the 2017/18 school year, this amounted to 22,266 pupils (Bula et al., 2019). In inclusive education, children with special educational needs (SEN) are educated alongside their typically developing (TD) peers. According to Farrell (2000), inclusion is described as "taking a full and active part in school-life, be[ing] a valued member of the school community and be[ing] seen as an integral member" (p. 154). Fundamentally, all students should get the best education according to their individual, academic, and social development. Therefore, promoting the social inclusion[2] of students with and without SEN is considered one of the central goals of inclusive education (Booth and Ainscow, 2002). However, studies show that SEN children in inclusive classrooms are at high risk of being socially excluded (Garrote et al., 2017). Compared to their peers, they have fewer interactions and friendships; children with intellectual disabilities (ID)[3] are particularly at risk of social exclusion (Ruijs and Peetsma, 2009; Garrote and Sermier Dessemontet, 2015). Bredahl (2013) reported that children with the least visible disabilities—including children with ID—were those most at risk of experiencing negative situations in inclusive education. Although it is widely assumed that social skill deficits and low conceptual skills can hinder students with ID from developing positive peer relationships (see review on special needs classrooms: Schoop-Kasteler and Müller, 2020), very little research has been conducted on children with ID in general education (Garrote, 2016). It becomes apparent that joint teaching alone does not guarantee that children with and without SEN are equally involved in social exchanges in their classes (King, 2013). Also, TD students do not like working with their low-achieving peers, including peers with SEN (Monchy et al., 2004). Consequently, teachers tend to avoid mixing TD and SEN students in group work, resulting in a lack of shared learning experiences (Garrote, 2017). There is a need to identify and investigate the factors involved in social inclusion and how it can be promoted.

Current research in the context of inclusive education shows that individual student variables are significant for the social inclusion of students. Findings presented in a study by Huber (2009) illustrate that the school performance of pupils has a considerable impact on the social inclusion of students with SEN. Other studies show that behavioral characteristics (Avramidis, 2010; Jones and Frederickson, 2010; Schwab et al., 2014; Garrote, 2017) and cognitive ability (Frederickson and Furnham, 1998) are necessary for social inclusion of students in inclusive classes. Gender (DeBoer et al., 2012) and psychomotor clumsiness (Ruiz-Pérez et al., 2018) also play an important role in social acceptance and interactions. Furthermore, research also suggests that class variables matter in social inclusion (e.g., class climate: Gasser et al., 2017; heterogeneity: Grütter et al., 2014; and class size: Park et al., 2014).

In addition to individual student and class variables, there is emerging evidence that teachers and their teaching strategies play a decisive role as facilitators of the integration of SEN students (Lindsay, 2007; Cooper, 2011; David and Kuyini, 2012; Klavina et al., 2014; Mitchell, 2014; Bertills et al., 2019). A review of the literature indicates that the teacher's positive attitude toward individuals with disabilities and inclusive schooling is decisive in the successful implementation of inclusion (Schwab, 2018). However, inclusive teaching strategies still pose a major challenge to teachers and their classroom practice (Bossaert et al., 2012). Especially when it comes to facilitating the social inclusion of students, few studies have addressed teacher strategies (DeLeeuw et al., 2019). Because of the broad range of disabilities, the complexity of successful implementation and the variety of different subjects' teaching strategies often remain overlooked in European policy and curriculum guidelines. Teaching strategies include suggestions on how to design inclusive teaching. In Switzerland, there are no mandatory guidelines on how teachers should act in inclusive classes. Also, in German-speaking countries, there is a little in the way of a subject-specific perspective on teaching strategies, and a general didactic focus has been applied in different school settings such as physical education (PE; Klein et al., 2016).

Inclusive education equally affects PE. PE is defined as the planned and progressive learning that takes place in the school curriculum. It involves both learning to move and moving to learn. In inclusive PE, all people (e.g., students with and without disability) are playing sport together and the diversity amongst learnings is welcomed. PE is inherently different from other subjects. Unlike other subjects, the body and sportiness are the focus of PE as a subject. Psychomotor skills and sportiness of students are very important aspects to experience successful PE. Furthermore, it takes place in a different environment, which is often not as structured as the one in the classroom. Above all, these specific characteristics of PE—compared to other subjects—make for frequent social interactions for all participants (Ruin et al., 2016a,b). "The appeal of PE often [lays] in being different and a break from 'normal' school lessons and, at the same time, an opportunity for informal social interaction and strengthening social bonds" (Røset et al., 2020, p. 1). Therefore, PE, along with all other curriculum areas, faces new kinds of challenges and opportunities with inclusive education. Generally, PE is considered to have a high potential for fostering social inclusion (Block et al., 2016). Talbot (2001) claims that PE helps children to develop respect for others and enhances social development.

In the last two decades, an increasing number of international studies examined the inclusion of students with SEN in inclusive PE (for reviews, see Qi and Ha, 2012; Wilhelmsen and Sørensen, 2017). O'Brien et al. (2009) and Reuker et al. (2016) focus on European perspectives, respectively, German-speaking literature. The main findings indicate that PE teaching staff were skeptical of the practical implementation. They also reported insufficient preparation for this during training (Rybová and Kudláček, 2013; Tant and Watelain, 2016), lacking appropriate resources to make inclusive PE work in practice (Jerlinder et al., 2010). Results

[2]There is an international discourse about the concept of the social dimension of inclusive education and many different definitions have been used. Following Koster et al. (2009), the term social inclusion is used in this study as a synonym for social integration or social participation.

[3]Current approaches view ID from a developmental perspective and rely on both intellectual abilities and adaptive functioning (World Health Organization [WHO], 2016). According to ICD 10, the diagnosis of an intellectual disability requires a state of delayed, or incomplete, development of mental abilities.

of the investigations into social inclusion in PE are strikingly ambivalent (Wilhelmsen and Sørensen, 2017). On the one hand, Seymour et al. (2009) indicated that most SEN students enjoy inclusive PE, and how PE is seen as a possible field for social interaction. In another study, a boy with social, emotional, and behavioral difficulties highlighted the special role of PE in the curriculum and the possibility to interact and socialize with peers (Medcalf et al., 2011). On the other hand, students with SEN reported negative peer interactions (e.g., bullying), exclusion from activities, and problems with physical ability in inclusive PE (Healy et al., 2013). Similarly, Fitzgerald and Stride (2012) report on three students with disabilities experiencing feelings of exclusion in PE and being marginally involved in the lessons. Healy et al. (2013) draw attention to the fact that exclusion experiences often arise because of PE teachers. In this context, Lieberman et al. (2006) also underline the importance of how teachers deal with students in inclusive PE. Discrimination in PE—as a factor inhibiting inclusion—is often based on physical differences (Meier and Ruin, 2015). It becomes clear that PE can both support and foster but also restrict or even impede the social inclusion of students with SEN. Detailed knowledge of relevant factors for fostering social inclusion is necessary. Notably, the question arises as to what teaching strategies can promote social inclusion in the context of inclusive PE.

Looking at national curriculum standards for PE in English- and German-speaking countries, it becomes evident that PE should enable students in a multi-perspective way (Elliott et al., 2016; Vickerman and Maher, 2019). In this context, multi-perspective means that there is not only one sense of doing sport, but that sport can be experienced as meaningful, giving meaning in many ways. Thereby, value orientation and the ability to act, among other elements, are at the center of PE goals. In this context, the "Doppelauftrag des Schulsports" is a common concept in German-speaking countries (Stibbe, 2013). On the one hand, individuals should be able to demonstrate competencies in a variety of motor skills, inspiring them to succeed in competitive sport and activities. On the other hand, students should also exhibit responsible personal and social behavior that helps to embed values such as fairness and respect. Therefore, social skills seem to be just as important as motor skills in today's PE. It is important to look at teaching strategies and their effect on social integration in order to achieve these two goals in inclusive PE. Therefore, theoretical considerations and empirical research on inclusive general education are reviewed as follows.

On the one hand, according to Hattie (2008), teacher feedback is one of the most effective approaches to successful learning development in classrooms. In order to evaluate a specific result of a student's performance, teachers need reference norms as feedback standards. In the literature, three reference norms have been discussed (Rheinberg, 1983): criterial (comparisons with an absolute standard), social (comparisons with the results of other students), and individual reference norms (comparisons with a student's past results). If a teacher is using the latter form, it is known as using an individual reference norm orientation (IRNO). Particularly in inclusive education, all learners with their different requirements are valued and an effective, precisely fitting, and individual promotion of every single child should be achieved. Therefore, teacher feedback should be individually given, using an IRNO. Furthermore, the teacher's feedback to an individual could play a decisive role in the formation of social hierarchies within the classroom (Garrote and Sermier Dessemontet, 2015). It can be assumed that teachers who use more individual feedback give more positive feedback to children with lower performance than teachers who base their feedback on comparisons between individuals. And when a student decides to initiate social interaction with another student, the teacher's behavior toward the other student is always considered as a social reference (Webster and Foschi, 1992).

On the other hand, ample empirical evidence from mainstream classrooms has shown that classroom norms set by teachers affect their students' social school experiences (Heyder et al., 2020). The general assumption that teaching cooperative skills is a suitable strategy to develop social behavior is well recognized (Putnam, 1993). Studies on social interdependence theory have validated that co-operation, as opposed to competitive and individualistic efforts, tends to result in more positive relationships (Johnson and Johnson, 2008). When a teacher teaches cooperative skills, it can be assumed that students develop social interaction skills, which in turn place students with SEN at a lower risk of being socially isolated (Jacques et al., 1998; Garrote, 2017). In this context, the research literature often uses the term cooperative learning (CL)[4]. "Cooperative Learning is a feasible pedagogical model, particularly for students with disabilities who may be excluded from whole-class activities that typically involve a command-style approach to teaching. It is equally effective for students lacking social skill competencies who do not always pick up on environmental or physical cues that direct learning" (Grenier and Yeaton, 2014, p. 122). Through positive interdependence and shared responsibility, CL is effective in promoting equitable peer relationships (Dyson et al., 2010). CL seems to reinforce the contact theory by Allport (1954). The socio-psychological contact theory of Allport (1954) is based on the assumption that increased and high-quality contact between members of different groups can reduce mutual prejudices. Empathy is strengthened during this contact, therefore qualitative social interactions between students are supported as an important goal of inclusive education.

The question arises of whether these considerations from general inclusive education are applicable in inclusive PE. Whilst inclusive PE with existing concepts is long established in some countries (e.g., the United States), the discourse about inclusive PE in German-speaking countries only recently gained momentum (Block et al., 2017). The school system in Switzerland is still lacking international inclusive trends, having had a long tradition of segregation. Giese et al. (2016) make a case for keeping up with international discourse around adapted physical activity and adapted PE. However, research on the relationship between social inclusion and PE teaching strategies is rare. There

[4]In CL, students work together to accomplish shared goals. In sociological studies, CL is associated with group structures, such as social acceptance or interactions among peers (Baines et al., 2008).

is still a lack of clear evidence to support the rhetoric about how PE can positively contribute to social inclusion.

To our knowledge, no prior study has investigated the relevance of using IRNO and teaching cooperative skills for the social inclusion of students with ID in inclusive PE in Switzerland. Our study tries to address this research gap by providing detailed knowledge about the role of teaching strategies in inclusive PE. The study clearly focuses on a specific target group, namely students with ID. The following section presents the conceptual framework of this study and the review of literature on the relationship between the teaching strategies (using IRNO and teaching cooperative skills) and the social inclusion of students.

CONCEPTUAL FRAMEWORK AND RESEARCH OVERVIEW

Student's Social Acceptance and Interactions in Inclusive Primary School PE

This study focuses on two of the four key aspects of social participation proposed by the heuristic of Koster et al. (2009): peer acceptance and social interactions. It is more true of PE than any other subject that the physicality of the learner is the center of attention, and the lessons take place in special learning environments (Meier and Ruin, 2015). Therefore, a subject-specific differentiation of social participation is believed to apply in PE, compared to the social participation in other school subjects. PE makes the diversity of students particularly visible and tangible. For this reason, it seems logical to look specifically at peer acceptance and positive interactions in PE lessons. Furthermore, peer-related assessment of social participation is of special interest in this study. Self-perception is acknowledged as another, and very important, key aspect by Koster et al. (2009), but this aspect is not of interest in this study[5]. Finally, friendships—the fourth key aspect identified by Koster et al. (2009)—is considered a relatively stable construct over time and is not primarily influenced by a single subject such as PE (Poulin and Chan, 2010).

The Role of Teaching Strategies

Garrote et al. (2017) conducted a review of general school-based interventions facilitating the social participation of students with SEN. However, limited research is available regarding effective PE teaching strategies in inclusive classes (O'Brien et al., 2009). Although Block (2016) and Vickerman and Maher (2019) published overviews of inclusive PE teaching strategies, they did not focus on the effects on student's social participation. However, for IRNO and cooperative skills, some important conditions for success can be identified from general inclusive education, which can also have important implications for PE. Since literature on ID is scarce, it is important to note that these are study results results that do not only focus on children with ID, but rather address different types of disabilities.

Effects of Using IRNO on Student's Social Acceptance and Interactions

Empirical evidence from research on IRNO and the social participation of students is very scarce. Krawinkel et al. (2017) showed that students with SEN benefit from individual feedback. In an inclusive classroom setting, they were less rejected and felt better integrated than other students with SEN in classes with a lower level of individual feedback. The authors discuss the buffering effect of IRNO, but admit, however, that the relationships are correlative and do not indicate any direction of action. This relationship could not be found in studies of children without SEN.

It can be assumed that, especially for children with ID whose motor and physical fitness measures are below their TD peers (Stanton-Nichols and Block, 2016), individual feedback is more positive than feedback based on social comparison. In inclusive classroom education, it has been shown that positive teacher feedback may enhance the social participation of students with SEN. In an intervention study, Schwab et al. (2016) investigated the influence of teacher feedback on the social acceptance of peers with ID and peers without disabilities. The findings confirm the critical influence of teacher feedback on the social acceptance of students. They seem to indicate that positive feedback could lead to more acceptance of students by their peers. In a similar study, Huber et al. (2018) produced some important guidelines for the promotion of social acceptance of students. Their main findings indicate that teachers can provide support for the social acceptance of students and prevent students from being rejected in their classes by using positive feedback. In another study by White and Jones (2000), of 128 first and second graders, the authors showed that, in particular, negative teacher feedback on student behavior has a significant and marked effect on the social attractiveness of these students. Likewise, the results of a study by McAuliffe et al. (2009) suggest that corrective and negative teacher feedback toward students mediated the relations between aggressive and prosocial child behavior and peer disliking. The results support the critical role of teachers in the link between student's behavior and being disliked by their peers.

A search of the research literature on the effect of teacher feedback, or IRNO, on the social acceptance or positive interactions of students in inclusive PE did not find any studies.

Effects of Teaching Cooperative Skills on Students' Social Acceptance and Interactions

The research literature on teaching cooperative skills is scarce. The role of teachers in creating classroom norms aimed at increasing positive peer interactions has been discussed in the study on mainstream classrooms by Audley-Piotrowski et al. (2015). The authors conclude that promoting positive classroom environments will improve peer relationships (for review, see Farmer et al., 2011).

However, there is ample evidence in the field of inclusive education in classrooms on the effect of CL on social acceptance

[5]The aim of this study is to provide an objectified perspective on the social participation to be adopted at the level of the PE class.

and positive interactions. A recent review article by Garrote et al. (2017) identified intervention studies resulting in positive social acceptance. They also found studies on the interaction effects of CL in inclusive classroom settings. In a mainstream education study in New Zealand, Jacques et al. (1998) examined the effects of a CL program on the social acceptance by their TD peers of classmates with mild ID. The TD students in the experimental classes showed significant increases in their social acceptance (as measured by sociometric ratings) of the students with mild ID, both immediately following the program and 5 weeks later. However, no such increases were evident in the students in the control classrooms. The results speak for the effectiveness of CL in enhancing the social acceptance of students with mild ID in general inclusive education. In another study, Piercy et al. (2002) also implemented a CL program to improve the social acceptance by TD students of students with moderate to severe ID. Significant effects over 10 weeks in the CL group indicated that TD children gave the special class children at the same school higher peer acceptance ratings, and that there were also more frequent interactions with the children without disabilities.

The literature review showed some results specifically for PE. Grenier and Yeaton (2014) proposed CL as a suitable inclusive practice in PE. The authors present CL as a viable strategy that can "provide an opportunity for students to engage in reciprocal relationships when instruction is provided in a manner that fosters positive social interactions" (p. 133). Results from a 5-week intervention period study show that CL positively influenced the acceptance by their TD peers of the students with SEN (André et al., 2011). Also, Casey and Quennerstedt (2020) argue that CL is a suitable way to learn "soft" factors such as prosocial behaviors rather than the "hard" particular sporting skills. Dowler (2014, 2017) found that the CL intervention in a single-subject-multiple-baseline study was responsible for the increase in the frequency of interaction and the improvement in some of the quality measures of interactions between students with mild ID and their TD peers. Similarly, in a case study on inclusive PE, Keh and Hsieh (2007) found that CL had the potential to increase the social status and peer relationships of a student with mild ID in the 5th grade.

Research Questions

Despite the knowledge available on general inclusive education and, specifically, on inclusive PE, there is still a lack of knowledge about effective PE teaching strategies relating to aspects of social participation of students with ID. The review of the literature on teaching strategies in mainstream classrooms revealed that using IRNO and teaching cooperative skills are promising ways of fostering the social participation of students, but that further knowledge is needed. The question remains if this is also the case in inclusive PE in primary school classes, particularly concerning IRNO. Our study aims to obtain comprehensive knowledge by analyzing the role of PE teaching strategies in the social participation of students in inclusive PE. Specifically, it is assumed that IRNO and teaching cooperative skills are positively related to the beneficial social participation in PE of children with ID. Our study contributes to this research gap and is one of the first studies to investigate the relationship between IRNO and teaching cooperative skills with elaborated and differentiated measures of the social participation of students in inclusive primary school PE. The assumptions are analyzed in a cross-sectional study in the Swiss context.

By addressing this research gap, we contribute to the current knowledge on how to support successful inclusive education in PE. The results may also be transferable to the classroom setting. The existing situation resulted in the following research questions for the current study:

(1) Generally, to what extent is IRNO by the teacher positively related to the social acceptance and positive interactions of students in inclusive PE? Specifically, to what extent does SEN status due to ID moderate the relationship between the social acceptance and positive interactions of students when teachers use IRNO?
(2) Generally, to what extent is teaching cooperative skills positively related to the social acceptance and positive interactions of students in inclusive PE? Specifically, to what extent does SEN status due to ID moderate the relationship between the social acceptance and positive interactions of students when cooperative skills are taught?

It is assumed that SEN status due to ID positively moderates the relationship between the teaching strategies outlined above (IRNO and teaching cooperative skills) and social acceptance and positive interactions in PE. This means that the examined aspects of social participation of students with ID are more positively related to the teaching strategies than those of the TD students.

MATERIALS AND METHODS

This study is embedded in the Swiss National Science Foundation project SoPariS (2018–2021), which focuses on the social participation of students with ID in inclusive PE in Switzerland's primary school classes (3rd to 6th grades, age 6 to 14 years). A cross-sectional study was conducted in 2019 using quantitative student and PE teacher questionnaires, gathering more data than was used for this study. It was reasonable to decrease the wide heterogeneity of the group of students with SEN by limiting the sample to students with ID. Firstly, this allows the derivation of valid knowledge on inclusive PE with students with ID. However, it is acknowledged that the range of abilities of students within the group of children with ID is very wide. Some children with ID will have no motor difficulties and can be very successful in an inclusive PE setting. In contrast, others lack an understanding of games, and PE class requires significant modifications to facilitate success (Stanton-Nichols and Block, 2016). Secondly, physical activity is especially important for children and adolescents with ID as it promotes body awareness and acceptance of their own body (Reuter, 2019). In this way, PE provides new action skills, promoting social behavior and independence of individuals with ID (Wegner, 2001).

Participants

A total of 112 inclusive Swiss PE classes participated in this study. Regarding the student sample, 1,961 individuals took part (51% girls, M_{age} = 11.3 year, SD_{age} = 1.1 year). The mean number of students in the 112 classes was 17.5 (SD = 3.8), with a range of 9–25 students. Of the students, 64.4% had Swiss nationality, and the other 35.6% had a migration background. Furthermore, 78 boys and 54 girls had a diagnosed SEN[6] due to ID[7] (see **Table 1**). The range of students with ID in each class was from 1 to 4, with a mean of 1.18 students with ID per class. In inclusive classes, the special needs teacher is mainly responsible for supporting the students with SEN.

The teacher sample consisted of 110 individuals (M_{age} = 37.6 year, SD_{age} = 11.7 year), with a higher proportion of women (62%) than men. This approximately matches the unequal gender distribution in primary school teachers in Switzerland. The teachers' professional experience ranged from 0 to 38 years, with a mean of M = 12.2 years (SD = 11.1 year). Of these 110 teachers, 104 also taught the same class for other subjects. Six teachers only taught PE to the participating class. Two teachers did not fill out the questionnaire.

There was some loss of data because of incomplete questionnaires from students or teachers. In the overall sample, the questionnaires from 217 children (11.1%) had missing values on at least one variable relevant for this study (partly due to missing values in the teacher questionnaire about the children). These were excluded from the calculations so that the sample was reduced to 1,744 children, of whom 124 students had SEN status due to ID, in a total of 104 classes (see **Table 1**).

[6]Assessment regulations and labeling practices of SEN in Switzerland vary from canton to canton. The decision on SEN measures is made jointly by the parents, teacher, SEN teacher, and principal. The cantons use clarification and allocation procedures and corresponding guidelines as well as considering the existing range of places of support (ranging from regular to separate schools) to make case-related decisions on where students with SEN are being educated (Luder, 2018). This results in regions where no special schools exist, whereas, in other regions, many students with disabilities learn in special classes.

[7]In this sample, inclusion criteria for a child with SEN due to ID was the attribution of the label according to the teacher and principal and confirmed by the parents and the SEN teacher. However, due to ethical reasons, no IQ-Scores are available. In Switzerland, children with an IQ of less than 75 are basically eligible for SEN measures. In other countries (e.g., Germany) the upper limit is an IQ of 70. However, it should be noted that it is particularly difficult to reliably determine the IQ of children with ID (Meyer, 2003).

TABLE 1 | Descriptive statistics of student sample characteristics (*N* = 1744 students in 104 classes, excluded cases: *N* = 217).

	Without SEN			With SEN			Excluded cases		
	Age[1]	*n*	%	Age[1]	*n*	%	Age[1]	*n*	%
Boys	11.3	774	47.8	11.8	72	58.1	11.3	114	53.3
Girls	11.2	846	52.2	12.0	52	41.9	11.0	100	46.7
3rd grade	9.4	55	3.4	9.8	4	3.2	9.1	20	9.2
4th grade	10.5	411	25.4	11.2	27	21.8	10.2	38	17.5
5th grade	11.5	391	24.1	11.9	33	26.6	11.3	30	13.8
6th grade	12.4	250	15.4	12.9	20	16.1	12.7	49	22.6
Mixed grades	11.4	513	31.7	11.4	40	32.3	11.1	80	36.9
Total	11.2	1620	100	11.9	124	100	11.1	217	100

Three gender values are missing in the excluded cases. [1]Age in years.

Procedure

The study was carried out in co-operation with schools from the German-speaking part of Switzerland. Schools from 13 different cantons[8] participated in this study. First, cantonal directorates of education were contacted to get their approval. Second, principals were contacted and asked to provide lists of potential primary school classes with at least one student with ID (3rd to 6th grade). Third, teachers were contacted by mail and phone for voluntary study enrolment. School directors and teachers, as well as parents, gave consent to this study. Of the children, 91.5% were given permission to participate in this study. In order for a class to take part, at least one student with ID had to be allowed to participate per class. Data collection was undertaken in the classroom by at least one project team member and one master's student, who was specifically prepared for the data collection. Each item was read aloud. The children did not move on to the next page of the questionnaire until all children had finished answering each page. Class teachers, SEN teachers and the master's student supported the students during the questionnaire. The researchers emphasized to the students that completing the questionnaire was voluntary, that they could discontinue at any time without any reason, and that all data would be treated confidentially. Because other variables than those used for this study were also assessed as part of the SoPariS project, data collection lasted 90 min, including several breaks during which students could play activity games. Children were asked to put their questionnaires in an envelope and hand it to the examiners when they were finished so that teachers could not see their responses. Also, children used individual desks, or barriers were put in place so that they could not see each other's responses. Children who did not participate were asked to work at their desks quietly.

Measures

Assessment of Social Acceptance in PE by Classmates

Peer acceptance, as dependent variable in this study, is usually assessed with sociometric techniques using peer ratings (Cillessen, 2009). In peer ratings, all classmates rate each of their peers on a Likert-type scale in terms of how much they like them or would like to play with them (Krüger, 1976). In this study, the sociometric rating questionnaire *Sozio* was used (Eckhart, 2012). This questionnaire does not ask about affective attitudes toward the other children but about perceived interactions. In their study on retest reliability, Eckhart et al. (2011) found a significant correlation between two survey dates of 8 months in general education (Pearson correlation: N = 1894 students: $r = 0.526$; $p \leq 0.001$). The PE context was included, and students were asked to indicate on a five-point scale (0 = almost never,

[8]Switzerland consists of 26 cantons, each with its own constitution and its own legal and political authorities. Accordingly, school and education policy are also located at the cantonal level. Of these cantons, 21 have German as their official language and were therefore targeted in this study. Of these cantons, two cantonal directorates did not give their consent to contact the corresponding schools. And of 6 cantons, no school participated, despite cantonal consent.

4 = very much), e.g., *How much they talk with them in PE* and *how much they are feeling upset with them in PE*. Instructions were also given by the researchers that talking in PE classes also involved playing together during lessons or sitting next to each other in a circle. Prestige and negative-prestige scores of the students were calculated as the sum of all the received talking or upsetting interactions in PE divided by the number of possible talking or upsetting interactions in the class. Peer acceptance was then calculated by the difference of all incoming talking contacts (prestige) and all incoming upsetting contacts (negative-prestige), considering only the assessments of the peers in each class. The values, therefore, vary between −1 and 1. A value near −1 means poor social acceptance and a value near 1 is equal to good social acceptance.

Assessment of Positive Interactions in PE

Students' positive interactions, as the second dependent variable, were operationalized using the same sociometric rating scale mentioned above. In the literature, both outgoing and incoming ties are discussed and used for the assessment of interactions. For this study, the peer-related incoming talking contacts in PE were of interest. Therefore, the sociometric parameter, prestige, was used (peer rating: *How much they talk with them in PE*: 0 = almost never, 4 = very much). This, of course, also means that the two dependent variables (social acceptance and positive interactions) are not independent of each other. Prestige means the reputation of a person (Eckhart et al., 2011). In network analysis, prestige refers to the importance of an actor regarding the incoming assessments. It records how important the actor is in the network (Jansen, 2006). A person is considered to have high prestige if many actors in the network have frequent positive interactions with that person (Eckhart et al., 2011). In this study, the prestige score of a student was calculated as the sum of all the received talking interactions divided by the number of possible talking interactions in the class. The values, therefore, vary between 0 and 1. A value near 1 means that a student is getting almost all possible talking interactions and vice versa for a value near 0.

Assessment of IRNO

The students' perceived IRNO of the PE teacher was analyzed using a scale developed originally by Schwarzer et al. (1982) in an attempt to exclude the social desirability of teachers. The risk of socially desirable responses is particularly pronounced for topics with a clear social norm, as is the case with inclusive education (Avramidis and Norwich, 2002). The scale consists of four items (e.g., *Our PE teacher praises even the worst students, when she feels they have been improving*) on a 4-point Likert scale ranging from 0 (strongly disagree) to 3 (strongly agree). Schwarzer and Jerusalem (1999) published reliability scores of three different measuring times and received acceptable Cronbach's alpha of 0.64, 0.70, and 0.71. In another study, Oswald et al. (2013) reported a Cronbach's alpha at T1 and T2 of 0.66/0.71, indicating acceptable psychometric properties. High scores on this scale indicate that the teacher was perceived to have high IRNO. The analysis of internal consistency in this study indicated a Cronbach's alpha of 0.76 for all students and 0.70 for students with ID.

Assessment of Teaching Cooperative Skills

An assessment of teaching cooperative skills was carried out using a subscale of the FSTN questionnaire (Hoffmann, 2006). Students were asked to rate five items (e.g., *It is important to our PE teacher that we learn to work together in a group*) on a 4-point Likert scale ranging from 0 (strongly disagree) to 3 (strongly agree). Again, to avoid including the social desirability of teachers, the students assessed this teaching strategy. High scores on this scale indicate that the student perceived that their PE teacher expected them to behave cooperatively. According to a validation study by Hoffmann (2006), Cronbach's alpha was high (0.86). The analysis of internal consistency in this study indicated a comparable high Cronbach's alpha of 0.79 for all students and 0.81 for students with ID.

Assessment of Psychomotor Clumsiness

The questions for the qualitative assessment of movement behavior were based on the checklist of motor behavior by Schilling (1976). This assessment consists of 78 items from eight different dimensions of movement behavior. For this study, the dimension of psychomotor clumsiness is used, and the number of items was reduced to three. Psychomotor clumsiness, which describes awkward and clumsy movement behavior, is accompanied by restricted movement. The dimension is also defined with a strongly slowed down movement learning. This instrument was used to describe sportiness. In the selection of these three adjectives, results from the preliminary study, and from the study by Valkanover (2005), were consulted, revealing a Cronbach's alpha of 0.76 in the preliminary study. Teachers were asked to rate these three items [e.g., *The movement behavior of the child in self-chosen (movement) tasks is clumsy*] for every student on a 5-point Likert scale ranging from 0 (does not apply at all) to 4 (fully applicable). The analysis of internal consistency in this study indicated a high Cronbach's alpha of 0.87 for all students by the teachers.

Data Analysis

For the evaluation, the nested structure of the data is considered. The characteristics of the students at level 1 (L1) have been coded for SEN status (0 = no SEN status, 1 = SEN status) and gender (0 = male, 1 = female). Psychomotor clumsiness at L1 was used as a continues variable. SEN status, gender and psychomotor clumsiness were included as controlling individual L1 variables. Variables have also been defined at level 2 (L2) and used as continues variables (IRNO and teaching cooperative skills). Multilevel analyses with the R statistics program and the *nmle* package have been implemented (R Core Team, 2015). With 104 classes and 1,744 students, the sample sizes at the two levels meet the requirements for multilevel models, especially for the estimation of fixed parameters and their standard errors (Hox, 2010). In order to use the degrees of freedom as sparingly as possible, the overall model was built up step by step (Snijders and Bosker, 1999). For this purpose, individual variables, contextual variables on L2, and cross-level interactions are added to the null model one after the other. The intraclass correlations (ICC) of $\rho = 0.159$ for the social acceptance and $\rho = 0.244$ for the positive social

TABLE 2 | Descriptive statistics of study variables and intercorrelations.

	N	*M*	SD	Min	Max	(2)	(3)	(4)	(5)	(6)	(7)
(1) SEN status (0 = no, 1 = yes)						**−0.05**[c]	**−0.24**[b]	**−0.27**[b]	**−0.28**[b]	0.02[b]	0.01[b]
(2) Gender (0 = male, 1 = female)							−0.03[b]	**0.10**[b]	**−0.06**[b]	−0.02[b]	−0.01[b]
(3) Psychmotor clumsiness	1744	1.25	1	0	4			**−0.33**[a]	**−0.35**[a]	0.03[a]	0.01[a]
(4) Social acceptance in PE	1744	0.22	0.20	−0.58	0.85				**0.82**[a]	**0.08**[a]	**0.11**[a]
(5) Positive interactions in PE	1744	0.41	0.13	0	0.85					−0.01[a]	0.04[a]
(6) IRNO (class mean)	104	2.05	0.32	0.93	2.80						**0.74**[a]
(7) Cooperative skills (class mean)	104	2.38	0.28	1.35	3.00						

Coefficients printed in bold are significant with $p \leq 0.05$; SEN, special educational need; PE, physical education; IRNO, individual reference norm orientation; M, mean; SD, standard deviation; [a]Pearson correlation; [b]point-biserial correlation; and [c]Phi coefficient.

interactions showed large ICC's (Hox, 2010). These values are higher than those revealed by prior research for students' election status and rejection status in inclusive classrooms in Germany (e.g., Krawinkel et al., 2017; ICC's between 0.023 and 0.149). The values of the present study clearly indicate the necessity of applying multilevel analyses. And because the central goal of this study was to investigate cross-level interactions, multi-level analyses were conducted for both dependent variables.

The predictors on L1 and L2 have been centered for better interpretation of the results. The rules of thumb of Enders and Tofighi (2007) have been applied, using both centering within cluster (SEN status) and centering at the grand mean (gender, psychomotor clumsiness, IRNO and teaching cooperative skills). In the result tables, the standardized beta coefficients were used to be able to compare the values directly.

Ethics and Quality

The study was approved by the Faculty's Ethical Committee of the University of Bern. Parental consent for all students was obtained.

RESULTS

Descriptive Statistics

Table 2 shows the mean values and standard deviations of the psychomotor clumsiness, social acceptance in PE, positive interactions in PE, IRNO, and cooperative skills. The teachers' perception of students' psychomotor clumsiness showed an average of 1.25, meaning that students were little (=1) to partly clumsy (=2). The full range of values between 0 and 4 was applied. The average social acceptance in PE of all children was 0.22, i.e., students received, on average, 22% (SD = 20%) more talking interactions than upsetting interactions. In PE, the range between −0.58 and 0.85 shows the wide variance of students being rejected (negative scores) or accepted (positive scores). On average, all students received 41% of all possible talking interactions in PE (SD = 13%). Social acceptance and positive interactions in PE correlate significantly and positively ($r = 0.82$, $p \leq 0.05$). The high intercorrelation between the two dependent variables can be taken as an indication that they are very similar facets of social participation, and that they are clearly interrelated. Both social acceptance and positive interactions in PE significantly correlate negatively with the SEN status ($r = -0.27$ resp. -0.28, $p \leq 0.05$). Students with ID have significantly lower values in the social acceptance and positive interaction scales in PE.

For the IRNO and cooperative skills, aggregated class means were calculated to find the value for the teaching strategy. As shown in **Table 2**, the average score on the 4-point Likert scale for the IRNO was 2.05 (SD = 0.32), indicating that students generally agreed that teachers used IRNO in their PE lessons. Values for teaching cooperative skills were higher with a mean of 2.38 (SD = 0.28). Students perceived their teachers as teaching cooperative skills in their PE lessons quite often. The relatively high positive and significant intercorrelation between IRNO and cooperative skills ($r = 0.74$, $p \leq 0.05$) suggests that when students perceive their teachers using IRNO, they think that the teachers are teaching cooperative skills or vice versa.

IRNO

Factors for Social Acceptance in PE

Looking at the first dependent variable, social acceptance of peers in PE, it turns out that SEN status is a significant predictor ($p \leq 0.001$, see **Table 3**, model 1). If a student has SEN status, social acceptance in PE is significantly decreased ($\Delta = 0.19$). Also, the gender of a student is a significant predictor ($p \leq 0.001$) of social acceptance: Boys were rejected more often than girls. Psychomotor clumsiness, assessed by the teacher, revealed to be the strongest predictor. The higher the clumsiness, the lower the social acceptance of a student in PE ($p \leq 0.001$). All three individual student variables (control variables) explained 15.4% of the marginal R^2. With respect to the explanation of the conditional R^2 by the whole model, the consideration of the random effect "class" (in addition to the fixed effect) results in an increase of the explained variance for social acceptance to 31.1% (see Nakagawa and Schielzeth, 2013). Therefore, class effects play an important role in social acceptance, confirming the large ICC mentioned above ($\rho = 0.160$).

The aggregated predictor IRNO at class L2 was added to model 1 to answer the first research question. The IRNO was centered at the grand mean. The inclusion of this variable did not affect the effect of the control variables SEN status, gender, and psychomotor clumsiness. There is a positive and significant correlation between the IRNO (L2) of the PE teacher and the social acceptance of the students ($p \leq 0.05$) in PE. The marginal R^2 increased to 16.3%, the conditional R^2 stayed the same. Higher

TABLE 3 | Multilevel models of social acceptance of the students in PE.

	Empty model	Model 1	Model 2	Model 3
Level 1				
SEN status		−0.190*** (0.021)	−0.191*** (0.021)	−0.195*** (0.021)
Gender student		0.083*** (0.020)	0.083*** (0.020)	0.085*** (0.020)
Psychomotor clumsiness		−0.289*** (0.022)	−0.290*** (0.022)	−0.289*** (0.022)
Level 2				
IRNO (class mean)			0.103* (0.043)	0.103* (0.044)
Cross-level interaction				
IRNO (class mean) × SEN status				0.054** (0.020)
Model characteristics				
ICC	0.160			
AIC	−725.08	−1038.68	−1036.88	−1038.17
$R^2_{GLMM(m)}$	0	0.154	0.163	0.165
$R^2_{GLMM(c)}$	0.160	0.311	0.311	0.315

****p ≤ 0.001; **p ≤ 0.01; *p ≤ 0.05; N = 1744 students, N = 104 classes; Estimation of standardized regression coefficients with standard errors in parentheses; SEN, special educational need; IRNO, individual reference norm orientation; and $R^2_{GLMM(m)}$ = marginal R^2, $R^2_{GLMM(c)}$ = conditional R^2 (after Nakagawa and Schielzeth, 2013).*

values in the IRNO assessment of the teacher during the PE lessons correlated positively to a higher social acceptance of all the students, regardless of whether they had SEN status due to ID or not. By adding the cross-level interaction between the class mean IRNO and the SEN status (model 3), there was a significant effect ($p \leq 0.01$). Therefore, a differentiated effect of the IRNO teaching strategy at L2 of the PE teacher could be found for the social acceptance of students with ID compared to their TD peers. The added cross-level interaction could further raise the variances, as shown in **Table 3**.

Figure 1 shows the cross-level interaction effect between SEN status, IRNO, and social acceptance. It is apparent that the higher the IRNO of the PE teacher, the better the social acceptance of all students, regardless of having SEN status due to ID. However, the effect for students with ID is visibly and significantly greater in the higher slope. The relationship between students' social acceptance in PE and the IRNO of their teacher thus seems to depend on the SEN status ($p \leq 0.01$).

Factors for Positive Interactions in PE

Comparable to social acceptance, the control variables SEN status, gender, and psychomotor clumsiness are significant predictors of positive interactions in PE ($p \leq 0.001$, see **Table 4**). Students with ID have significantly fewer positive interactions with their peers in PE than students without ID. Girls have fewer positive interactions than boys. This is contrary to social acceptance mentioned above, where girls were more accepted than boys in PE. Furthermore, the higher the psychomotor clumsiness of a student, the fewer positive interactions he or she got. The marginal R^2 of the three individual L1 predictors in model 1 is 18.1%. The conditional R^2 is 42.6% and therefore higher than the one for social acceptance mentioned above. Class effects play an even more important role in the positive interactions, confirming the large ICC mentioned above ($\rho = 0.244$).

By adding the IRNO teaching strategy on L2 in model 2, a positive but not significant correlation can be found with the positive interactions in PE. The fixed effects explained the same variance as before and the conditional R^2 is also about the same. But, comparable to social acceptance, the analysis revealed a significant and positive cross-level interaction between aggregated IRNO and SEN status in model 3 ($p \leq 0.01$). For classes with teachers with high IRNO, the positive interactions of children with ID were higher than in the classes of teachers with low IRNO (see **Figure 2**). For TD students, the correlation is even slightly negative. In classes where teachers were using a high IRNO in PE lessons, TD students have slightly fewer positive interactions. Therefore, it can be assumed that any correlation between IRNO and positive interactions in PE for all students together is removed.

In sum, the IRNO teaching strategy revealed to be a significant predictor of social acceptance ($p \leq 0.05$) and a non-significant predictor of positive interactions of students in PE in general. For students with ID, specifically, high IRNO by the PE teacher is related to higher social acceptance by and more positive interactions with their peers ($p \leq 0.01$). For TD students, higher IRNO values in the PE teacher correlated positively with social acceptance, but negatively with the positive interactions in PE. In summary, this indicates that SEN status due to ID positively moderates the effect of IRNO and aspects of social participation.

Teaching Cooperative Skills

Factors for Social Acceptance in PE

To address the second research question, teaching cooperative skills in inclusive PE was analyzed. The empty model and model 1 are the same as in **Table 3**. The score of student perceived teaching cooperative skills was aggregated, centered at the grand mean (L2), and included in model 2 (see **Table 5**). The inclusion of this variable did not affect the effect of SEN status on social acceptance in PE, as mentioned above. Nor did it affect the effect of gender and psychomotor clumsiness ($p \leq 0.001$). Additionally, there is a positive and significant correlation between teaching cooperative skills at L2 and social acceptance in PE ($p \leq 0.01$), indicating that higher values in the social acceptance scale of all students is related to higher values in teaching cooperative skills of the PE teachers. The beta

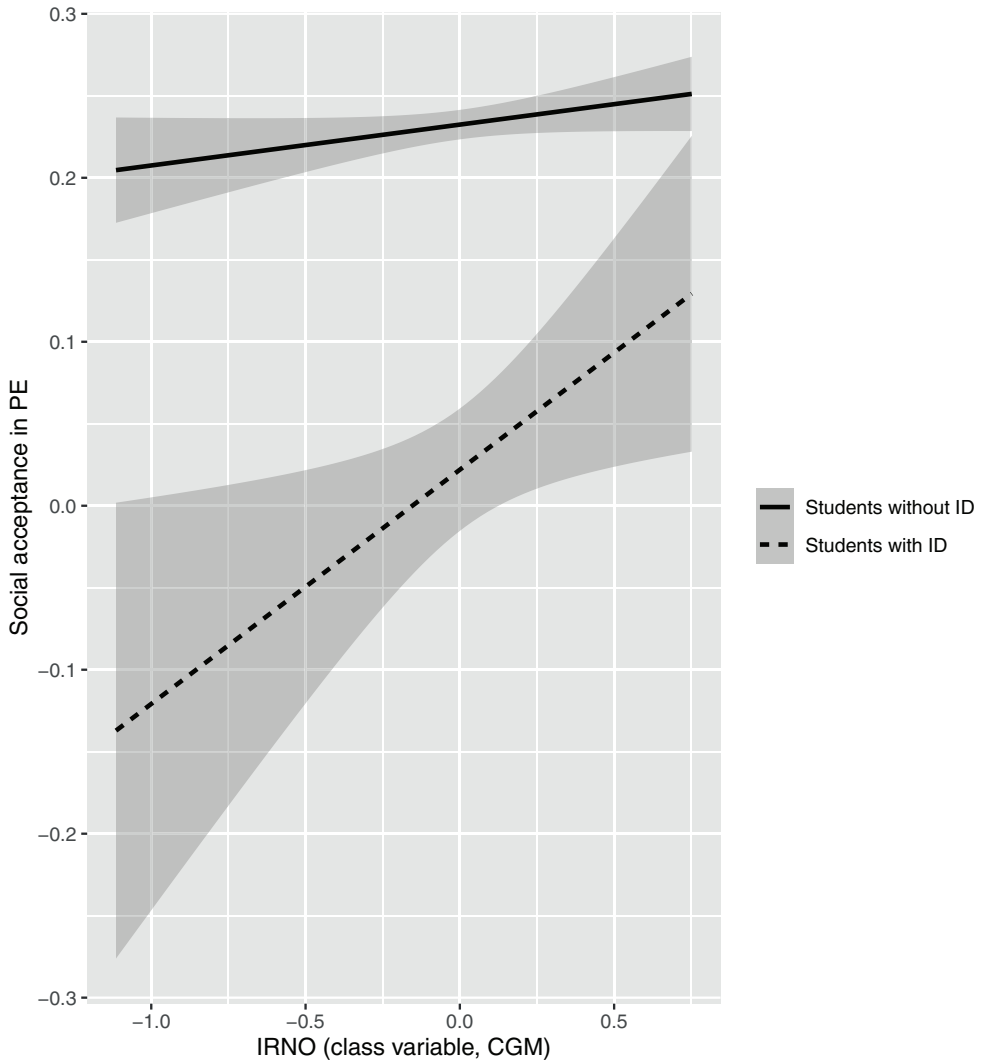

FIGURE 1 | Predicted social acceptance in physical education (PE) of children with and without intellectual disabilities (ID) related with the individual reference norm orientation (IRNO) of the PE teacher. The gray zones are the 95% confidence intervals. CGM, centered at grand mean.

value of 0.128 for teaching cooperative skills is higher than the one for IRNO (beta = 0.103, see **Table 3**). For this reason, it can be assumed that the strategy of teaching cooperative skills correlates higher with an increase in the social acceptance scale than the strategy of using IRNO in PE. Compared to the first model including only L1 variables, the marginal R^2 grew by 1.5 percentage points to 16.9%. The conditional R^2, on the other hand, increased only marginally. Adding the cross-level interaction between the class mean of teaching cooperative skills and the SEN status did not have a significant effect. There is no moderation of the SEN status due to ID between the strategy teaching cooperative skills and the social acceptance of students in PE. Also, the added cross-level interaction did not substantially increase the variances.

Figure 3 shows the interaction effect between teaching cooperative skills and social acceptance in PE. It is apparent that there is a positive and significant correlation for all students, regardless of whether they have SEN status due to ID or not.

Factors for Positive Interactions in PE

Again, the empty model and model 1 are the same as presented in **Table 4**. When adding the L2 teaching strategy in model 2, a positive but not significant correlation can be found between teaching cooperative skills and positive interactions in PE (see **Table 6**). The marginal R^2 explained almost the same variance as only the three control variables at the individual student level in model 1 (18.3%). Also, the conditional R^2 is very similar. SEN status does not moderate the effect between teaching cooperative skills and the positive interactions in PE (model 3). However, a tendency is visible insofar as students with ID experience relatively more positive interactions in PE, when their teacher teaches cooperative skills, than TD students. However, this difference is not significant.

TABLE 4 | Multilevel models of positive interactions of the students in PE.

	Empty model	Model 1	Model 2	Model 3
Level 1				
SEN status		−0.214*** (0.019)	−0.214*** (0.019)	−0.217*** (0.019)
Gender student		−0.082*** (0.019)	−0.082*** (0.019)	−0.081*** (0.019)
Psychomotor clumsiness		−0.323*** (0.020)	−0.323*** (0.020)	−0.322*** (0.020)
Level 2				
IRNO (class mean)			0.022 (0.053)	0.022 (0.053)
Cross-level interaction				
IRNO (class mean) × SEN status				0.050** (0.019)
Model characteristics				
ICC	0.244			
AIC	−2417.04	−2826.21	−2818.55	−2818.64
$R^2_{GLMM(m)}$	0	0.181	0.181	0.183
$R^2_{GLMM(c)}$	0.244	0.426	0.428	0.430

****p ≤ 0.001; **p ≤ 0.01; N = 1744 students, N = 104 classes; Estimation of standardized regression coefficients with standard errors in parentheses; SEN, special educational need; IRNO, individual reference norm orientation; and $R^2_{GLMM(m)}$ = marginal R^2, $R^2_{GLMM(c)}$ = conditional R^2 (after Nakagawa and Schielzeth, 2013).*

No more variance can be explained by adding the cross-level interaction.

Taken together, the teaching strategy of teaching cooperative skills in inclusive PE was found to be a significant predictor for the social acceptance of students in inclusive PE ($p \leq 0.01$). No such connection was found for the relationship with positive interactions in PE. Contrary to the IRNO findings, no cross-level interactions were found for teaching cooperative skills, indicating that the SEN status due to ID does not positively moderate the effect between teaching cooperative skills and aspects of social participation.

DISCUSSION

This study addressed two research questions. The first question focused on the positive relationship between using IRNO in PE and the social acceptance and positive social interactions of students in inclusive PE. The second question addressed the positive relationship between teaching cooperative skills and the social acceptance and positive social interactions of students in inclusive PE. In summary, the results showed that a high IRNO of the PE teacher is positively related to higher social acceptance of the students and that the SEN status of children with ID positively moderated the relationship between the IRNO teaching strategy and both social acceptance and positive social interactions in inclusive PE in Switzerland's primary school classes (3rd to 6th grades). Regarding teaching cooperative skills in PE, there was a positive relationship with the social acceptance of children in inclusive PE, but no cross-level interaction for SEN status and no relationship with positive interactions in PE could be found. The results must be discussed because inclusive education is about striving for inclusive communities that foster social participation and the well-being of all students. For this reason, it is important to find teaching strategies that not only serve children with SEN but are beneficial for all children. However, since international work consistently shows that children with SEN included in general education classrooms are at risk of being socially excluded by their peers, it is very important to find ways to decrease this gap in social participation between students with and without SEN. This study helped to contribute to this highly relevant topic.

Concerning the first research question, this study showed that IRNO positively relates to peer acceptance of all the students, regardless of whether they have SEN status due to ID or not. This relationship could not be found for positive interactions. These results contradict the findings of Krawinkel et al. (2017), who found no relationship between the IRNO and the extent of social participation in mainstream education. On the other hand, the findings support the important influence of teacher feedback on students' social participation, as shown by Schwab et al. (2016) and Huber et al. (2018). Schwab et al. (2016) found a significant effect of positive teacher feedback and social acceptance not only for children with Down Syndrome but also for students without disabilities. Likewise, the data of Huber et al. (2018) showed that teacher feedback affected social acceptance ratings, although with smaller effect sizes than in the study by Schwab et al. (2016). A possible explanation for this partly ambivalent classification in the existing literature from general education is that PE takes place in a different setting than other classroom-based subjects and that PE has unique experience and education potential (Klein et al., 2016). In PE, the performance of a student is usually visible to peers. Therefore, if a teacher provides feedback for a student's performance based on IRNO, peers can ideally hear and understand the feedback, resulting in a positive change in the social acceptance of this student by peers.

The analysis of the cross-level interactions between IRNO and social acceptance/positive interactions showed some differentiated effects for students with ID. In particular, the social participation of students with ID is positively related to the IRNO of the PE teacher, which is in line with the work of Krawinkel et al. (2017). In their study with classes in which teachers base their performance feedback more on individual orientation, students with SEN were less likely to be rejected and experienced

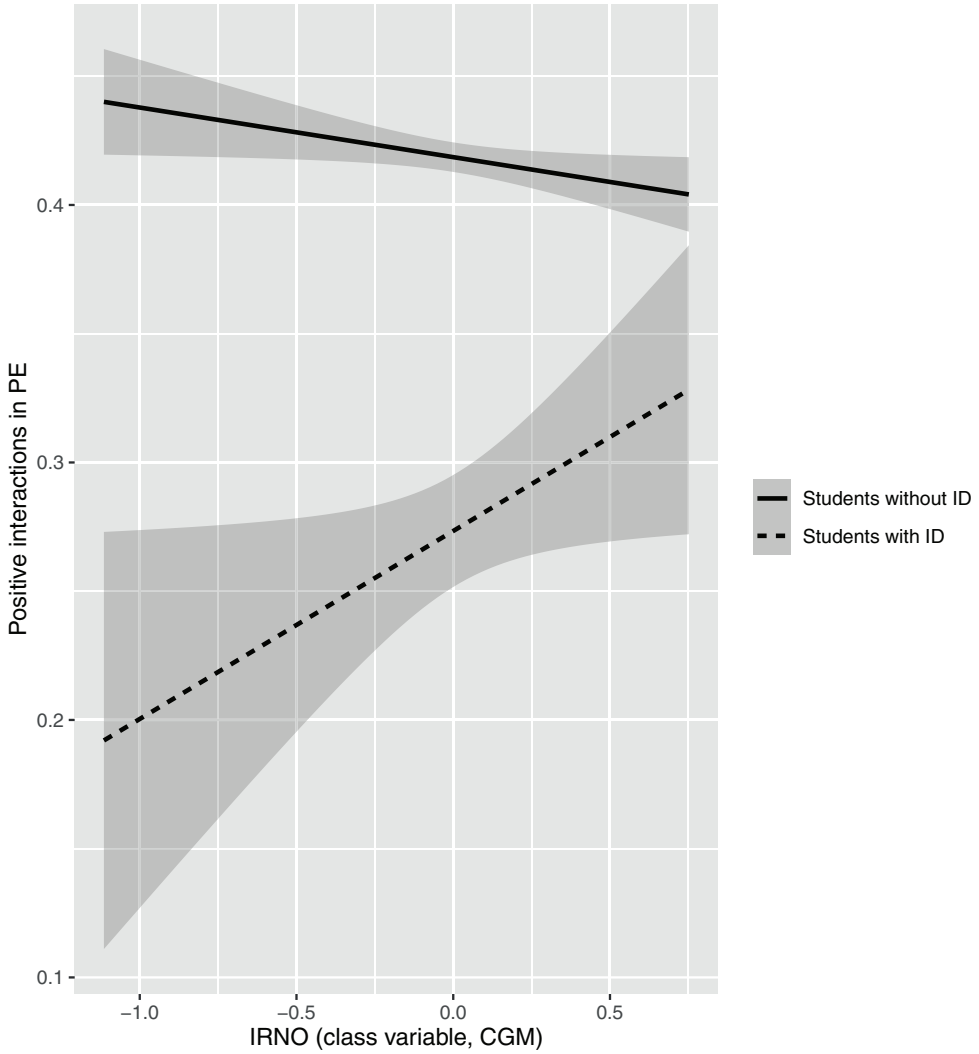

FIGURE 2 | Predicted positive interactions in physical education (PE) of children with and without intellectual disabilities (ID) related with the individual reference norm orientation (IRNO) of the PE teacher. The gray zones are the 95% confidence intervals. CGM, centered at grand mean.

more positive interactions in PE than in classes with teachers with lower IRNO. IRNO thus seems to fulfill a kind of buffering effect for the social participation of children with SEN. The increased risk of exclusion of children with SEN can be decreased by the strong IRNO of the teacher. In other words, the higher the IRNO of the PE teacher when giving feedback to students in present study, the smaller the gap in social participation between students with and without SEN due to ID. This effect might be explained insofar as students, especially students with ID, get more positive feedback from a PE teacher who uses IRNO. This explanation is contrary to the assumption that with feedback based on social comparisons, children with lower motor ability skills—and also students with ID—would receive more negative feedback. According to the theory of social referencing, where younger children, in particular, will look upon adult reference models for guidance (Walden and Ogan, 1988), the PE teacher with positive teacher-student interactions serves as a role model for the students. As a result, students with ID are more socially accepted by their TD peers in inclusive PE. Therefore, we provide novel detailed insights into the assumed relationship in inclusive PE that add to prior studies investigating the relationship between using IRNO and aspects of social participation for students with and without ID. As they confirm the moderating effect in the study by Krawinkel et al. (2017), our results might also be transferrable from a specific PE setting to a general discussion of inclusive education at primary school level.

Regarding teaching cooperative skills in the second research question, a positive relationship could be found with the social acceptance of the total sample of students in this study, including students with ID and their TD peers. This finding is partly in line with the work by André et al. (2011), who found that CL in inclusive PE positively influenced the acceptance of mainstream students with disabilities by their peers. However, their study did not measure the outcomes for students without disabilities.

TABLE 5 | Multilevel models of social acceptance of the students in PE.

	Empty model	Model 1	Model 2	Model 3
Level 1				
SEN status		−0.190*** (0.021)	−0.191*** (0.021)	−0.192*** (0.021)
Gender student		0.083*** (0.020)	0.083*** (0.020)	0.083*** (0.020)
Psychomotor clumsiness		−0.289*** (0.022)	−0.289*** (0.022)	−0.289*** (0.022)
Level 2				
Cooperative skills (class mean)			0.128** (0.044)	0.128** (0.044)
Cross-level interaction				
Cooperative skills (class mean) × SEN status				0.022 (0.020)
Model characteristics				
ICC	0.160			
AIC	−725.08	−1038.68	−1039.97	−1035.48
$R^2_{GLMM(m)}$	0	0.154	0.169	0.169
$R^2_{GLMM(c)}$	0.160	0.311	0.312	0.313

****p ≤ 0.001; **p ≤ 0.01; N = 1744 students, N = 104 classes; Estimation of standardized regression coefficients with standard errors in parentheses; SEN, special educational need; and $R^2_{GLMM(m)}$ = marginal R^2, $R^2_{GLMM(c)}$ = conditional R^2 (after Nakagawa and Schielzeth, 2013).*

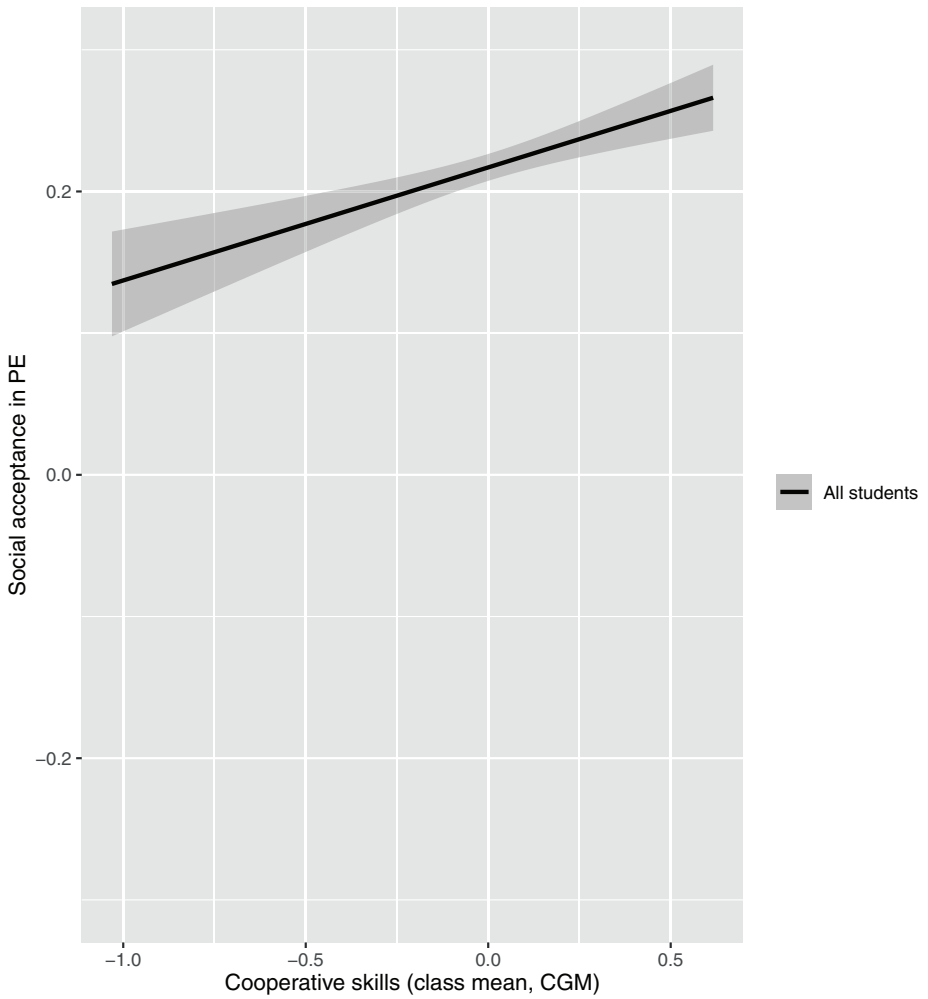

FIGURE 3 | Predicted social acceptance in physical education (PE) of all children related with taught cooperative skills by the PE teacher. The gray zones are the 95% confidence intervals. CGM, centered at grand mean.

TABLE 6 | Multilevel models of positive interactions of the students in PE.

	Empty model	Model 1	Model 2	Model 3
Level 1				
SEN status		−0.214*** (0.019)	−0.214*** (0.019)	−0.215*** (0.019)
Gender student		−0.082*** (0.019)	−0.082*** (0.019)	−0.082*** (0.019)
Psychomotor clumsiness		−0.323*** (0.020)	−0.323*** (0.020)	−0.324*** (0.020)
Level 2				
Cooperative skills (class mean)			0.053 (0.054)	0.053 (0.054)
Cross-level interaction				
Cooperative skills (class mean) × SEN status				0.028 (0.018)
Model characteristics				
ICC	0.244			
AIC	−2417.04	−2826.21	−2819.68	−2815.22
$R^2_{GLMM(m)}$	0	0.181	0.183	0.184
$R^2_{GLMM(c)}$	0.244	0.426	0.428	0.429

****p ≤ 0.001; N = 1744 students, N = 104 classes; Estimation of standardized regression coefficients with standard errors in parentheses; SEN, special educational need; and $R^2_{GLMM(m)}$ = marginal R^2, $R^2_{GLMM(c)}$ = conditional R^2 (after Nakagawa and Schielzeth, 2013).*

Furthermore, our study did not find any relationship between teaching cooperative skills and positive interactions in PE. This result does not correspond with the results from the studies by Dowler (2014), who found a positive relationship in secondary school PE classes in Australia. Interestingly, the results of their study also come from a sample of children with mild ID. However, the children were older and perhaps more receptive to CL in inclusive PE. On the other hand, the study by Keh and Hsieh (2007) found positive effects of CL in inclusive PE on the social status and peer relationships of a child with mild ID in exactly the same age group (5th grade). One potential explanation for the unexpected finding could be that teaching cooperative skills, as proposed by Hoffmann (2006), is not the same construct as CL, as defined by Dyson and Casey (2014a,b). This comparability of teaching cooperative skills and CL is arguable and thus must be discussed as a limiting factor of this study. However, our results make it possible to summarize that teaching cooperative skills in inclusive PE is a teaching strategy affecting the social dynamics of the whole class in primary school, regardless of whether students have SEN status due to ID or not. High scores on teaching cooperative skills are related to better scores on the social acceptance scale. This result from a PE setting might contribute to the discourse of teaching strategies in general inclusive primary school education, regardless of what the children's disabilities are.

Furthermore, the findings demonstrate that joint teaching (inclusive classes) alone does not guarantee that children with and without ID will be equally involved in social exchanges in class. The three individual student variables (SEN status, gender, and psychomotor clumsiness), which were used as control variables, revealed to be significant predictors of aspects of social participation. The strong predictor of SEN status is in line with international work in general education, reporting a higher risk of social exclusion for students with SEN (Garrote and Sermier Dessemontet, 2015). Focusing on the social acceptance and interactions in inclusive PE, the results support the ambivalent findings insofar as students with ID are socially less accepted and experience fewer positive interactions. This finding supports mostly qualitative work (Place and Hodge, 2001; Bredahl, 2013). Furthermore, the gender of the student is a significant predictor for social acceptance and positive interactions in inclusive PE. Interestingly, girls are better socially accepted, but they experience fewer positive interactions in inclusive PE. This result is partly in line with the work of Krawinkel et al. (2017), who found a significantly higher rejection rate for boys than for girls. It does not support the findings of Schwab (2015), who found no gender effect on peer acceptance and social interactions in Austria's inclusive classes. It further implies that, in our study, boys must have experienced more negative and upsetting interactions in PE than girls, explaining the difference in social acceptance and positive interactions in PE. Therefore, gender must be considered when talking about inclusive education. Finally, the strong predictor of psychomotor clumsiness in social acceptance and positive interactions in PE is in line with the research by Ommundsen et al. (2010). The authors found that 1st grade motor proficiency and objectively measured physical activity was predictive of 4th grade social standing among pupils in class measured by sociometric status. This result might be attributable to a sports-related and performance-oriented PE and contributes to the general discussion about a change in the perception of body and performance in inclusive PE (Meier and Ruin, 2015). Our results suggest that for inclusive PE, the idea of performance should not be highlighted.

The relatively large difference between the marginal and the conditional R^2 of all models is striking. The difference is even more significant for the models analyzing the variance of the positive interactions than in the models with social acceptance in PE. The control variables of SEN status, gender, and psychomotor clumsiness could explain around 18% of the variance. Adding the two teaching strategies as predictors did only explain little more variance, still leaving significant between-cluster heterogeneity. This relativizes the importance of the teacher and their teaching strategies in fostering social participation in inclusive PE. Other

than the discussed individual variables in this study, it can be speculated that there are still more individual variables predicting aspects of social participation. According to the study by Garrote (2017), rejected students with ID were estimated as being less cooperative and prosocial than accepted students with ID, indicating that the social behavior skills of students might play a decisive role in predicting social acceptance in general. In another study, DeBoer et al. (2012) investigated the role of peer attitudes on peer acceptance. The research group found that there is a relationship between peer attitudes and peer acceptance of students with disabilities in general primary education.

In addition to other individual variables of students, some teacher characteristics might also be of importance in predicting aspects of the social participation of students. As mentioned above, studies focusing on teachers' beliefs and attitudes toward the inclusion of children with disabilities in PE still dominate research in inclusive PE (Wilhelmsen and Sørensen, 2017). Teachers are generally seen as key players in the implementation of inclusive education, the success of which implies a positive attitude (Jerlinder et al., 2010). However, the research literature is scarce on the role of attitudes for the social experiences of students with and without SEN (Heyder et al., 2020). The data by Heyder et al. (2020) on inclusive general education suggests that increased teachers' beliefs are related to a decreased gap between the social integration of students with and without SEN. Furthermore, contextual factors might also explain some variance. As noted in the introduction, class size (Park et al., 2014) and class climate (Gasser et al., 2017; Krawinkel et al., 2017) can be used to further explain the variance of aspects of social participation. Finally, successful social participation of all students may only be possible in school settings that provide the necessary support and resources (Borg et al., 2011).

To conclude, our study is one of the first to analyze the role of using IRNO and teaching cooperative skills in inclusive PE settings in primary school education. In sum, the central findings of this study revealed some significant relationships. The high IRNO of the PE teacher is positively related to higher social acceptance of students, and the SEN status of children with ID positively moderated the relationship between the IRNO teaching strategy and both social acceptance and positive social interactions in inclusive PE. Regarding teaching cooperative skills in PE, there was a positive relationship with the social acceptance of children in inclusive PE. On the downside, the study also revealed that the teaching strategies examined in our study were not generally predictive of social acceptance and positive interactions in PE. The findings contribute to close the research gap in examining the role of teaching strategies in inclusive PE and by adding knowledge transferable to general inclusive education.

Limitations and Implications for Future Research

This study also had some limitations. It should be considered that only cross-sectional data was examined. Therefore, no statements about the direction of action of teaching characteristics and social acceptance/positive interactions can be derived. Even if the considerations here assume an influence of the teacher on social participation (based on the empirical evidence of longitudinal studies in the literature review), interactions are conceivable. This should be examined more closely in further investigations, using experimental research with different teaching strategies in longitudinal studies. With this limitation in mind, our findings indicate that it might be promising to focus on the IRNO of teachers and its effect on social participation in PE in future studies.

Furthermore, the number of students with SEN status per class in the present study is quite small compared to the number of students with no SEN diagnosis. In the field of inclusive education, such a small number of students with SEN status in the sample is normal, but it decreases the test power of the study (Henke et al., 2017). In further research, it might be fruitful to focus on a sufficiently large sample with more children with SEN status in each class.

Additionally, for the dependent variables, quantitative measures were used. Although attention was paid to the extent to which a person was spoken to, the answers were all equally weighted and finally combined into one value of social acceptance or prestige. Consequently, no conclusions can be drawn about the quality of the two aspects of social participation. For a student, it may be more beneficial to have one peer with whom one has many positive interactions and is fully accepted in PE than having few positive interactions with and not really being accepted by many peers. In future studies, qualitative aspects of social participation should be examined as well.

Also, the high correlation between the two dependent variables social acceptance and positive interactions in PE (r = 0.82) does not account for two different and independent aspects of social participation, as proposed in the review by Koster et al. (2009). Nevertheless, our study found different effects for the two dependent variables. This clearly indicates the importance of negative interactions in PE (negative-prestige), which are taken into account for the social acceptance score. Furthermore, more research looking at other aspects of social participation is of great interest to gain more insights into the relationship between teaching strategies and social participation. Juvonen and Bear (1992) and Gable et al. (1997) emphasized not only the importance of peer relations but also stressed the student's self-perception as an important part of the definition of social participation. Further research should, therefore, include not only the peer-related aspects but also the self-perception of each student. Especially with IRNO, relationships with related self-concepts might be assumed. The work by Oswald (2013) or by Conzelmann et al. (2011) in mainstream PE clearly indicated that the use of IRNO by PE teachers influences aspects of self-concept positively. It would be very interesting to test this effect in inclusive PE.

Finally, we tried to focus on one group of students with disabilities, namely children with ID. However, we must admit that this population is still very heterogeneous, and generalized statements must be made carefully. The examined teaching

strategies are very general teaching methods in PE and need to be adapted individually and applied or modified from case to case to get the desired positive social participation. A one-size-fits-all approach would not be suitable and thus limiting the conclusions of our study.

Further research is needed to investigate the relationship between teaching strategies, teacher characteristics (e.g., attitude), class variables (e.g., class climate), student characteristics (e.g., peer attitude), and the social participation of students in inclusive PE. It also seems potentially fruitful to explore possible moderators, such as the nature of the students' SEN. Furthermore, future research could also test these findings in other settings than general classrooms and PE, e.g., in music lessons or art classes. And finally, future research should also use alternate methods to questionnaires. Although we assessed the teaching strategies through students, these responses could also be biased by social desirability.

CONCLUSION

Despite the limitations mentioned above, the results are of value for teacher education. This novel study provides an insight into inclusive PE with children with ID in primary school. Results may be used for PE teacher education in primary school and further education of in-service teachers preparing them to use effective teaching strategies in inclusive PE to meet all the students' needs. The results also provide implications on what in-service teachers in PE can do to promote the social participation of students and especially of students with ID. A transfer of the knowledge gained to inclusive education in the classroom setting is worth considering, since the primary education teachers' repertoire of effective teaching strategies to promote social participation is still limited (DeLeeuw et al., 2019).

The results showed that IRNO is positively related to social acceptance and positive interactions in inclusive PE, and the SEN status of children with ID positively moderated both relationships. Hence, IRNO may help to decrease the gap in social participation between students with and without ID. Regarding teaching cooperative skills in PE, there was a positive relationship with the social acceptance of all children in PE, but no cross-level interaction for the SEN status and no relationship with positive interactions in PE. Despite these results, the importance of the mentioned teaching strategies in fostering the social participation of students in PE must be relativized. Individual variables among children still make a more significant difference when explaining social participation in inclusive PE in primary school.

Teachers must be prepared to act effectively to face the new kinds of challenges and opportunities in PE, which come with the increased heterogeneity of students and inclusive education. To decrease the gap between the social participation of students with and without SEN, teachers need to have a set of different and effective teaching strategies to meet the individual needs of students. Teaching cooperative skills and using IRNO seem to be valid teaching strategies to achieve this goal.

DATA AVAILABILITY STATEMENT

The datasets presented in this article are not readily available because it is planned to publish the used data in a repository after the project end (open access). This procedure has been agreed with the Swiss National Science Foundation (SNSF). Requests to access the datasets should be directed to VF, vitus.furrer@phbern.ch.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Faculty's Ethical Committee of the University of Bern. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

All authors contributed to conception and design of the study, contributed to manuscript revision, read, and approved the submitted version. VF organized the data collection, database, performed the statistical analysis, and wrote the first draft of the manuscript. SN, SV, and ME examined the research methods, and VF and SV conceptualized the findings.

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