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Peer rejection and negative teacher feedback: a person-centred approach for identifying students at risk in Swiss elementary classrooms

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ABSTRACT

A person-centred approach was used to identify subgroups of students at risk of negative social interactions. Eighteen teachers and their 358 first- to third-grade elementary students in Switzerland were studied. Three subgroups were identified based on student social and language skills, peer rejection, and teacher feedback. Most of the students had high social skills, low peer rejection levels, and average language skills. One subgroup had the lowest levels of language skills and high levels of peer rejection. The smallest subgroup was characterised by having the lowest level of social skills, more negative teacher feedback and peer rejection.

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The relationships and interactions of children with their peers and teachers are crucial for their social-emotional development (Davis and Allen 2023; Hamre and Pianta 2001). If students are rejected by their peers or have frequent negative interactions with their teachers (e.g. negative teacher feedback) this can have detrimental long-term effects (Graham, Bellmore, and Mize 2006; Hamre and Pianta 2001; Ladd, Ettekal, and Kochenderfer-Ladd 2017). There is evidence that the accumulation of such negative social experiences can lead to increased problems with social adjustment (Troop-Gordon and Kuntz 2013).

Previous research on the social interactions and relationships of students has generally used a variable-centred approach to investigate the link between individual student characteristics and negative social interactions with teachers and peers (e.g. Grünigen et al. 2012; Haselager et al. 2002; Hendrickx et al. 2017; Spilles et al. 2023). An alternative is to identify distinct subgroups of students who experience similar social difficulties and have similar key characteristics (e.g. Denham et al. 2012; van den Berg, Burk, and Cillessen 2015). While a variable-centred approach might identify a strong relationship between student lack skills and social negative interactions with peers and teachers, a person-centred approach might reveal that this relationship only exists for a specific subgroup, such as highly rejected students. It would therefore be particularly valuable for identifying students who experience an accumulation of negative factors and would benefit from special support in school.

This study uses a person-centred approach to identify such at-risk students in first to third-grade elementary classrooms in Switzerland. In Switzerland, elementary school students are enrolled in the same class and have one main teacher. This teacher is a reference person who teaches most subjects, is the primary contact for parents, and is responsible not only for the students' academic

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development but also for their social learning. The curriculum framework for compulsory education places great emphasis on social learning as an essential part of school education. Since main teachers typically stay with the same class for multiple years, they develop strong relationships with their students, enabling personalised support and guidance. Given the significance of this role, a positive relationship with students is essential. A negative relationship, reflected in negative social interactions (i.e. negative teacher feedback), can have an adverse impact on children's development as well as their acceptance in the peer group (Hendrickx et al. 2017; McAuliffe, Hubbard, and Romano 2009).

Education researchers and teachers are always looking for ways to promote positive interactions and relationships to create an environment that is conducive to learning for all students (Farmer et al. 2019). Investigating social interactions by considering individual and contextual indicators in classrooms can help to gather information about the factors which lead to students having social difficulties and improve our understanding of how specific indicators relate to children's social difficulties. Thus, to identify students at risk we base our analysis not only on the students' levels of social and language skills (individual indicators) but also on contextual indicators, such as teacher interactions with students in class (i.e. teacher feedback) and peer rejection, as a proxy for negative interactions with peers. The simultaneous consideration of multiple individual and contextual indicators makes it possible to address the interaction between indicators within subgroups of students. To increase the ecological validity of the study, we use peer rejection as reported by multiple respondents and student characteristics (i.e. social and language skills), as well as observational data (i.e. teacher feedback).

Teacher feedback and peer rejection

From a social ecological perspective (Bronfenbrenner 1979; Farmer, Lines, and Hamm 2011) children's development is affected by their individual characteristics and their social environment which, at the individual and contextual level, interact with each other. The social environment of the classroom, including peers and teachers, also determines which characteristics or behaviours are more socially acceptable and therefore have an influence on the social experiences of individual students (Mikami, Lerner, and Lun 2010). Teacher behaviour has been identified as one of the key factors shaping student social experiences in the classroom (Farmer, Lines, and Hamm 2011; McAuliffe, Hubbard, and Romano 2009).

The classroom context, where daily student social interactions occur, is largely shaped by teachers (Farmer et al. 2019; Juvonen et al. 2019). Therefore, there is growing interest in how teacher behaviour and peer social dynamics may be linked (Endedijk et al. 2022; Farmer, Lines, and Hamm 2011). Social learning theory (Bandura 1971) and social referencing theory (Feinman 1992) suggest that the interactions of teachers with students are perceived by other students and this in turn influences the way students interact with each other. It is therefore important when studying peer rejection in students to also look at teacher–student interactions.

Teacher feedback related to student performance or behaviour is a common form of teacher–student interaction in the classroom (Rubie-Davies 2007). Most of the feedback given by teachers during a lesson is for correct student contributions (Garrote et al. 2024; Wullschleger et al. 2020). Teachers usually encourage quick exchanges to maintain the flow of the interaction by posing simple questions about the learning content and prompting students to provide brief contributions (Rubie-Davies 2007). These contributions are often followed by teacher feedback (e.g. 'correct', 'try again'). However, disruptive behaviour by students can interrupt the flow of these interactions. The usual teacher response is to give (negative) feedback designed to fix the incorrect social behaviour and restore the flow (Beaman and Wheldall 2000; Wullschleger et al. 2020).

Public teacher feedback conveys direct content – correct contribution, incorrect social behaviour – but also indirectly telegraphs clues about the teacher–student relationship to peers. Peers witness the interaction and may use the information to decide whether they wish to interact with students or avoid them. Studies have shown a significant relationship between teacher feedback and peer

preference (Garrote et al. 2024; 2017; McAuliffe, Hubbard, and Romano 2009; Spilles et al. 2023; Wullschleger et al. 2020). When students are perceived by their peers as having positive interactions with the teacher, it can result in greater acceptance by the peer group (Hughes, Im, and Wehrly 2014). By contrast, students who receive more negative feedback from their teachers are more likely to be disliked by their peers (Hendrickx et al. 2017; McAuliffe, Hubbard, and Romano 2009). This means that some students not only experience negative interactions with their teachers but are also at greater risk of being involved in negative interactions with their peers (Troop-Gordon and Kuntz 2013). These social processes can hinder the social adjustment of these students, potentially leading to negative outcomes such as lower levels of classroom engagement (Ladd, Herald-Brown, and Reiser 2008) or externalising problems (Ladd and Troop-Gordon 2003). It is important to identify which students are at greater risk of experiencing an accumulation of negative interactions at school to avoid such outcomes.

Teacher feedback and student skills

Studies by McAuliffe, Hubbard, and Romano (2009) and Hendrickx et al. (2017) show that the influence of student social skills (e.g. prosocial behaviour) on teacher feedback is not negligible. Students who have lower levels of social skills are more likely to receive generally negative teacher feedback (Hendrickx et al. 2017) or specific negative feedback for incorrect social behaviour (McAuliffe, Hubbard, and Romano 2009). This is consistent with models of social-emotional learning that conceptualise social skills as part of relationship skills that affect relationships and interactions with peers and teachers (Denham et al. 2012). Peers also perceive these students as disruptive. Thus, it is likely that the rejection of students by peers is determined by their social behaviour (García Bacete et al. 2017). This means that student social skills should be considered when examining the relationship between teacher feedback and peer rejection. It also suggests that some students are more likely to experience negative interactions with both their peers and teachers because they lack social skills. It is essential that researchers and teachers can identify these students so that they can be supported.

Peer rejection and student skills

Students have to be socialised for formal education to be effective. Having social difficulties, such as being rejected or widely disliked by peers, can have a negative impact on a student's health and social behaviour (Ladd and Troop-Gordon 2003; Peters et al. 2011), on their school engagement and, ultimately, on their academic achievement (Ladd, Ettekal, and Kochenderfer-Ladd 2017). Given these negative outcomes for students experiencing peer rejection, researchers would benefit from being able to identify those students who are at greater risk as early as possible.

Models of social-emotional learning state that social skills, such as prosocial and cooperative behaviour, are aspects of relationship skills and thus affect the peer group status of children (Denham et al. 2012; Rose-Krasnor and Denham 2009). In line with these theoretical models, longitudinal studies have consistently demonstrated a negative association between social skills and peer rejection. For instance, a study by Caputi et al. (2012), with students aged five at the first measurement and seven at the third, found that low social skill levels were a predictor of peer rejection. In a study focusing on male elementary school students, Haselager et al. (2002) explored the relationship between trajectories of prosocial behaviour and peer rejection. The cluster analysis identified a subgroup with stable high peer rejection and low levels of prosocial behaviour. In another subgroup, decreasing peer rejection was related to increasing prosocial behaviour.

Social skills have a positive association with language skills (Girard et al. 2017; Grünigen et al. 2012). Effective communication is essential for successful social interaction. When students have good language skills, they can express their intentions to peers clearly and communicate their willingness to help others and understand their needs and feelings. Students with poor language skills

can struggle to express themselves adequately, which can lead to misunderstandings and conflicts with peers. Grünigen et al. (2012) found that in pre-schoolers the relationship between language skills and peer victimisation was mediated by students' social skills, such as their prosocial behaviour and ability to set limits.

In summary, studies have found associations between social skills, language skills, and peer rejection. A person-centred approach can reveal subgroups of students who share similar characteristics or patterns of response and thus identify any subgroups that are affected by an accumulation of negative factors. Previous studies have been able to group students into distinct subgroups for peer status using the person-centred approach. Favre et al. (2022) and van den Berg, Burk, and Cillessen (2015) identified three subgroups of students based on their status in their peer group: subgroups had high, average, or low levels of peer rejection. A person-centred study on social-emotional learning by Denham et al. (2012) also identified three subgroups – one was an at-risk subgroup with the lowest levels of social skills while the other two were composed of socially competent children. However, how multiple factors – social skills, language skills, and peer rejection – are represented in subgroups of students has not been investigated.

Present study

The present study seeks to distinguish subgroups of elementary school students who are similar in their levels of peer rejection experienced as well as amount and type of teacher feedback received. This will enable the identification of students at risk and patterns of social experiences in classrooms. We use a person-centred approach that focuses on individual differences and can reveal subgroups that variable-centred analyses can overlook. The assessment of teacher feedback was based on observations of class discussions of cooperative activities carried out earlier (details see 2.2.). Social and language skills were added as subgroup indicators because student social and language skills are important in this context. The following research question were investigated:

What subgroups of students can be found by looking at teacher feedback, student social and language skills, and peer rejection?

Hypotheses H1a – H1c: Based on previous research on peer status (e.g. van den Berg, Burk, and Cillessen 2015), we predict that at least three subgroups emerge from the observed variables: they would be characterised by having high, average, or low levels of peer rejection (H1a). Hypotheses about social and language skills and teacher feedback are based on how these indicators relate to peer rejection and are thus only formulated for the potential subgroup with the highest level of peer rejection. Based on previous findings (Grünigen et al. 2012; Haselager et al. 2002; Verlinden et al. 2014), it is assumed that the subgroup of students with the highest level of peer rejection is also characterised by poor social and language skills (H1b). Related to their low levels of social skills, this subgroup of students is also hypothesised to be more likely to receive teacher feedback on their incorrect social behaviour during class (H1c), as established by previous studies (e.g. McAuliffe, Hubbard, and Romano 2009).

Materials and methods

Participants

Participants were 18 teachers and their first to third-grade students ($N = 358$; 48% girls; Mage_months = 84.55, SD = 7.75, Minmonths = 72, Maxmonths = 121) in 18 classrooms in the German-speaking part of Switzerland (Table 1). Most students (78%) spoke the language of instruction at home (German). Of those, approximately a third (35%) spoke an additional language at home, and 13% of the total sample had a home language which differed from the language of instruction. Half of the classrooms ($n = 9$) comprised only first-grade students, five included first and second-grade students, and one included first to third-grade students.

Table 1. Student and classroom characteristics.

	n (%)	*M* (SD)	Missing
Male students	187 (52.2%)		0%
Home language different from language of instruction	47 (13.1%)		9%
Language skills	337	2.63 (0.65)	6%
Social skills	351	3.65 (0.77)	2%
Peer rejection[a]	351	3.08 (2.36)	2%
Number of students per class		19.67 (2.48)	
Number of participants per class		19.5 (2.67)	

[a]Values are not standardised.

The study was conducted in accordance with the University of Zurich ethics policy. Participation was voluntary, in compliance with guidelines established by the ethics committee. Teachers and parents gave their informed consent. Parents were asked for separate written informed consent for the videorecording. Students whose parents consented for their children to participate in the study but refused permission for videorecording ($n = 45$), sat out of the field of vision of the cameras during the recording sessions. In three classrooms 18–30% of the students could not be recorded, so class discussions were audio recorded instead, ensuring anonymity while providing a naturalistic seating arrangement for the class discussion.

Procedure

Student data were collected at the beginning of the school year. Students were interviewed individually by a trained member of the research team. Prior to the survey, the children were informed that their data would remain confidential and would not be shared with anyone. They were also clearly told that participation was voluntary and that they could withdraw their consent at any time. All questions were read to them and students indicated their answers on a printed rating-scale. The answers were simultaneously entered into a computer by the member of the research team.

Teacher feedback was assessed using recordings from a semi-standardised class discussion made three months into the school year. The classes were recorded during a reflective discussion of a cooperative activity (e.g. drawing a picture together without speaking) carried out earlier. The students made oral contributions to the discussion. For standardisation, the teacher guided the class discussion using only the questions provided by the research team (e.g. 'How did your pair collaboration work?', 'What was difficult, and why?').

Measures

Teacher feedback behaviour

Teacher feedback behaviour was coded using the MAXQDA program and a coding manual (Table 2). The coding manual was based on an existing instrument that had been used in a study on teacher feedback (Wullschleger et al. 2020). In a first step, sequences with teacher feedback were identified in the recordings. Because this study was interested in the effect of feedback on social processes in the peer group, a sequence was coded as a feedback event if a teacher reacted immediately to a student's answers, activities/behaviour, or learning output by informing the student about the correctness of their response. The inter-coder agreement in MAXQDA was measured by comparing the duration of the coded sequences in milliseconds. The coders agreed on the code, but not on the exact duration of the sequence. This is reflected in a Cohen's kappa of $\hat{\kappa} = .79$ for coder agreement for this step.

In the second step, the previously identified sequences were coded with the recipient of the feedback (i.e. class, group, student in public). Only sequences involving a teacher addressing a student in public were considered in the subsequent steps because this feedback informs a student's

Table 2. Coding manual – teacher feedback behaviour.

Coding steps		Category	Description
1	Occurrence of feedback	–	Teacher's immediate reaction to a student answer, activities, or learning outputs.
2	Feedback recipient	Class	The teacher gives feedback to the whole class, e.g. 'You are all doing a very good job.'
		Group	The teacher gives feedback to a group of students, e.g. 'You should listen to each other.'
		Student	The feedback is directed at a single student.
3	Content of feedback	Social behaviour	Feedback on disturbances, observance of rules, etc. during the class discussion.
		Contribution	Feedback on the contribution related to the cooperative activity prior to the class discussion.
4	Assessment of response	Correct Incorrect	The feedback informs the student about the correctness of an answer, a behaviour, or a contribution.

classmates about the teacher's assessment of a student's answer, activity/behaviour, and learning output. In step 3, the content of the feedback was coded: student social behaviour during the class discussion or contribution related to the cooperative activity prior to the class discussion. Step 4 was coding the assessment of the student's answers, activities, or learning outputs by the teacher (correct or incorrect social behaviour and correct or incorrect contribution). This resulted in four teacher feedback scores for each student. The inter-coder agreement of two coders for steps 2–4 was very good, with a Cohen's Kappa score of $\kappa = .91$. To reflect the classroom level, the four teacher feedback scores for each student were divided by the total of feedback teachers addressed to individual students during the lesson.

Peer rejection

The peer rejection level of students was determined by asking them questions about playing together at the beginning of the school year. Participants rated how much they liked to play with each classmate on a five-point-scale with smileys (1 = ☹ = 'I do not like to play with X at all' to 5 = ☺ = 'I like to play with X a lot'). A rejection score was calculated for each student by counting the lowest ratings received from their classmates and dividing it by the number of participants in the class minus 1 ($M = 0.16$, SD = 0.12, Min = 0, Max = 0.52).

Student social skill

Student social skills were assessed at the beginning of the school year using two subscales based on the Self- and Other-Oriented Social Competences questionnaire (Perren, Forrester-Knauss, and Alsaker 2012): prosocial behaviour and cooperative behaviour. Deficits in these social skills are associated with peer rejection (von Grünigen et al. 2012). Each subscale had four items. Participants were asked to rate the prosocial behaviour (e.g. 'X helps voluntarily if someone is hurt, upset, or feeling ill.') and cooperative behaviour (e.g. 'X willingly takes turns in peer activities.') of four randomly selected classmates on a five-point scale with smileys (1 = ☹ = 'I do not agree at all' to 5 = ☺ = 'I totally agree'). Based on these peer ratings, a mean score was calculated for each student. The social skills variable was validated using confirmatory factor analysis (CFA). Two factors were assumed – prosocial and cooperative behaviour – with four items for each. Latent variables were allowed to covary. The CFA results indicated a good fit between the model and the observed data for the construct of social skills, $\chi^2(19) = 77.60$, $p < .001$, CFI = 0.98, RMSEA = .09, SRMR = 0.02.

Student language skills

Teachers rated participants' language skills with two items (i.e. 'This student understands German in class.' and 'This student can express him/herself well in German in class.') on a four-point Likert scale

(0 = 'I do not agree at all' to 3 = 'I totally agree'). The correlation between the two items was strong $r = 0.85$. A mean score of both ratings was calculated for each student.

Statistical analyses

Latent Profile Analysis (LPA) is a person-centred approach that enables the identification of unobservable profiles within a population using observed variables. The purpose is to identify subgroups of individuals who share similar characteristics. We used LPA to examine subgroups of students with similar skills and interactions. Peer rejection, social and language skills, teacher feedback for incorrect social behaviour, and teacher feedback for correct contributions were introduced as indicators for the latent profiles. Single imputation and scaling of variables were applied in the models using the tidyLPA 1.1.0 R package (Rosenberg et al. 2018). Model variance was estimated as equal across profiles and covariances were constrained to zero. To determine the number of profiles, one to five-profile solutions were tested in an iterative process. The best-fitting model was chosen based on the Akaike information criterion (AIC), the Bayesian information criterion (BIC), bootstrap likelihood ratio test (BLRT), and the entropy value (Tein, Coxe, and Cham 2013). Smaller values of AIC and BIC indicate a better fit. Significant *p*-values for the BLRT indicate that the fit of a model with *k*-classes is significantly better than that of a model with *k*-1 classes. Entropy provides an indication of how well the LPA model distinguishes between different profiles based on observed variables. A higher entropy value (closer to 1) suggests more distinct and accurate classification (Nylund-Gibson et al. 2014). Values higher than 0.8 indicate that the latent profiles are highly discriminating. The classification probabilities were also considered when selecting the model. The classification probability represents the most likely latent profile membership of an individual. Here values higher than 0.8 are recommended (Spurk et al. 2020). Class size was a selection criterion because further analyses and interpretations of the results require a reasonable number of students in each subgroup. After identifying a suitable model, Bonferroni-corrected post-hoc tests were run to explore the significant differences in the indicators between the profiles.

Results

Teacher feedback frequency data

Table 3 summarises the frequency data for feedback coding. Instances of teacher feedback differed between the classes ($M = 24.39$, $SD = 10.04$; $Min = 8$; $Max = 41$). Public feedback to an individual student accounts for, on average, 87% of all feedback detected and its frequency varied between teachers ($M = 21.11$, $SD = 9.62$; $Min = 2$; $Max = 36$). Of all feedback directed at individual students in public, 55% related to correct contributions. Most of the feedback for social behaviour targeted incorrect behaviour and ranged from 0 to 15 instances. Most students did not receive feedback for correct or incorrect social behaviour (81.6%; 64.8%) or for incorrect contributions (82%). By contrast, more than half of students received at least one (25%) or more (26%) instance of feedback for a correct contribution. As there were only 13 instances of feedback for correct social behaviour and 12 for incorrect contributions in total, these variables were omitted from further analyses.

Table 3. Frequency data for feedback coding.

Code	*n*	%	*M*	SD	Min	Max
Recipient: student in public	356	100	1.18	1.73	0	15
Correct social behaviour	13	3.6	0.04	0.23	0	2
Incorrect social behaviour	136	38.2	0.45	1.29	0	15
Correct contribution	195	54.8	0.64	0.95	0	5
Incorrect contribution	12	3.4	0.04	0.25	0	3

Table 4. Model fit indices for latent profile analysis: one- to five-profile solutions.

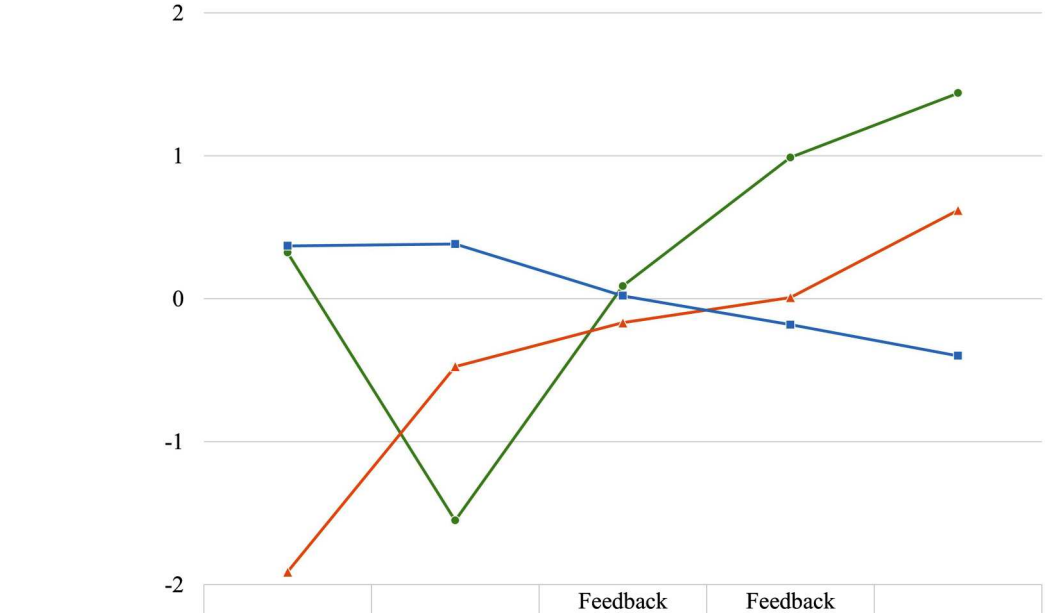
Nr. of Profiles	AIC	BIC	Entropy	CProb Min	CProb Max	Smallest Profile %	BLRT *p*
1	5094.79	5133.60					
2	4847.08	4909.17	0.87	0.86	0.98	16%	0.01
3	4698.32	4783.69	0.89	0.88	0.97	13%	0.01
4	4550.85	4659.51	0.91	0.87	1.00	1%	0.01
5	4406.47	4538.41	0.92	0.85	1.00	1%	0.01

Note. AIC, Akaike information criterion; BIC, Bayesian information criterion; BLRT, bootstrap likelihood ration test; CProb, Classification probabilities for the most likely latent profile membership.

Subgroups based on individual and contextual indicators

The model fit indices for one- to five-profile solutions were analysed to identify subgroups of students based on the observed data (Table 4). All profile solutions have a significant BLRT *p*-value; however, the three-profile solution is the most appropriate. Its entropy is higher than that of the two- or the four-profile solution. The five-profile solution has the highest entropy and the lowest AIC and BIC values. However, the smallest profile in the five-profile solution includes 1% of the population, whereas the smallest profile in the three-profile solution includes 13%. For these reasons, the three-profile solution was chosen for further analysis.

Three subgroups of students were identified based on teacher feedback behaviour, peer rejection, and student social and language skills (Figure 1). Bonferroni-corrected post-hoc analyses revealed significant differences in peer rejection between all three subgroups (H1a confirmed): between the subgroups *high rejection* and *average rejection* ($p < .001$, $M_{Diff} = 0.12$, 95%-CI[0.07,



	Language skills	Social skills	Feedback correct contributions	Feedback incorrect social behaviour	Peer rejection
High rejection	0.32	-1.55	0.09	0.99	1.44
Average rejection	-1.91	-0.47	-0.17	0.01	0.62
Low rejection	0.37	0.38	0.02	-0.18	-0.40

Figure 1. Three-profile solution based on individual and contextual indicators.

Note. Standardised means of profile estimates for each indicator.

0.16]), between *high rejection* and *low rejection* ($p < .001$, $M_{Diff} = 0.23$, 95%-CI[0.20, 0.27]), and between *average rejection* and *low rejection* ($p < .001$, $M_{Diff} = 0.12$, 95%-CI[0.09, 0.15]).

The subgroup *high rejection* ($n = 45$, 13%) is characterised by having the lowest levels of social skills compared to the other two groups (*average rejection*: $p < .001$, $M_{Diff} = 0.91$, 95%-CI[0.64, 1.18]; *low rejection*: $p < .001$, $M_{Diff} = 1.59$, 95%-CI[1.37, 1.81]), as hypothesised (H1b). However, H1b was only partially confirmed because this subgroup did not have the lowest levels of language skills. The subgroup did have, however, the highest levels of feedback received for incorrect social behaviour of the three subgroups (H1c confirmed; *average rejection*: $p < .001$, $M_{Diff} = 0.04$, 95%-CI[0.02, 0.07]; *low rejection*: $p < .001$, $M_{Diff} = 0.06$, 95%-CI[0.04, 0.07]).

The *average rejection* subgroup ($n = 59$, 16%) includes students who had the lowest levels of language skills of the three subgroups (*high rejection*: $p < .001$, $M_{Diff} = 1.44$, 95%-CI[1.27, 1.62]; *low rejection*: $p < .001$, $M_{Diff} = 1.47$, 95%-CI[1.35, 1.59]). This subgroup had significantly lower levels of social skills than the subgroup *low rejection* ($p < .001$, $M_{Diff} = 0.91$, 95%-CI[0.64, 1.18]) but significantly higher than the subgroup *high rejection* ($p < .001$, $M_{Diff} = 0.68$, 95%-CI[0.48, 0.87]).

The *low rejection* subgroup ($n = 254$, 71%) is comprised of students who displayed the highest levels of social skills. These students did not differ significantly in their language skills from students in the *high rejection* subgroup ($p = .88$, $M_{Diff} = 0.03$, 95%-CI[−0.11, 0.17]) nor in feedback received for incorrect social behaviour compared to the *average rejection* subgroup ($p = .21$, $M_{Diff} = 0.01$, 95%-CI[−0.004, 0.03]). The three subgroups did not significantly differ in terms of feedback received for correct contributions.

Discussion

This study used a person-centred approach to identify distinct subgroups of students in elementary classrooms based on the students' skills and social interactions with teachers and peers. We focused on language skills and prosocial and cooperative behaviour since they affect relationships and peer group status (Denham et al. 2012; Grünigen et al. 2012; Rose-Krasnor and Denham 2009) and because they influence the performance of students in the context of the recorded class discussions. During these class discussions, teacher feedback for student contributions and social behaviour were observed to examine student interactions with teachers. We selected peer rejection as an indicator for social interactions with peers because it has been shown to have a significant negative effect on student development (Ladd, Herald-Brown, and Reiser 2008).

In line with van den Berg, Burk, and Cillessen (2015) and Favre et al. (2022) we identified three subgroups of students with *high, average, and low rejection* levels. The subgroups with high and average rejection levels are the most interesting for the development of prevention strategies. The *high rejection* subgroup was characterised by students perceived to be displaying a significant lack of cooperative and prosocial behaviour. These students mainly received teacher feedback for incorrect social behaviour during class discussions; most of their teacher interactions were negative. The results of the person-centred approach confirm previous variable-based research that found significant relationships between social skills and peer rejection (Caputi et al. 2012; García Bacete et al. 2017; Haselager et al. 2002; Verlinden et al. 2014), teacher feedback and peer rejection, and social skills and teacher feedback (Hendrickx et al. 2017; McAuliffe, Hubbard, and Romano 2009). Interestingly, we did not find a subgroup with low social and language skills and high levels of peer rejection and negative teacher feedback. The *high rejection* students had the lowest levels of social skills but had similar language skills to *low rejection* students. Conversely, the subgroup of students with the poorest language skills (*average rejection*) were more socially skilled than the *high rejection* subgroup and did not experience as many negative interactions with teachers as students in the *high rejection* subgroup. Although variable-centred analyses found a positive relationship between language and social skills (Girard et al. 2017; Grünigen et al. 2012), our person-centred analysis indicates that this relationship does not apply for all students, only for students with high social and language skills who are in the *low rejection* subgroup. On a positive note, we did not find evidence of a lack of

skills accumulating in several domains, such as language and social skills, among rejected students. This finding is particularly important for children with a migration background who are learning the language of instruction. It should not be automatically assumed that their lower language proficiency also reflects lower levels of social skills. It also suggests that teachers should use individually adapted strategies to support students who are rejected by peers. Rejected students with poor language skills can benefit from support to increase their proficiency in the language of instruction while students with weak social skills could benefit from social skill training. Thus, tailored interventions are sensible, following an assessment to determine the specific domains in which rejected students need special support.

Like previous studies by Beaman and Wheldall (2000) and Wullschleger et al. (2020), we found that teachers tended to comment more on the correct contributions of students than the incorrect ones and on incorrect social behaviour than correct. The novelty of our study is that the results also provide information about the students who received these types of teacher feedback. All subgroups received similar amounts of positive teacher feedback on contributions. Thus, it seems that during class discussions teachers shaped their social interactions with students irrespective of their status within the peer group. This can be interpreted as a positive aspect of professional teaching practice. In contrast, teachers had predominantly negative interactions, with recurring comments on disruptive student behaviour, with the *high rejection* subgroup. This subgroup was characterised by high rejection and low social skills levels. Repetitive negative teacher feedback directed at certain students has also been reported in studies of students with behavioural problems (Jack et al. 1996; Nelson and Roberts 2000). Nelson and Roberts (2000) observed that some students were unlikely to comply with teachers' attempt to correct their disruptive behaviour, leading to repeated negative interactions between teachers and these students. This begs the question of whether this type of feedback is effective. Given that teacher interactions with students can affect peer dynamics (Farmer, Lines, and Hamm 2011), teachers should be alerted to the potential impact of negative feedback on students who are rejected by peers and have low social skills and encouraged to modify their interactions.

Limitations

Observing teacher behaviour in the naturalistic setting of a semi-standardised lesson provides valuable information about social interactions between teachers and students. We focused on teacher feedback behaviour, but did not assess whether the interaction was initiated by the teacher or the student. Thus, we can only analyse the interactions from the perspective of the information teachers gave to students. We did not verify whether feedback was justified. This means that although the at-risk subgroup received significantly more feedback on incorrect social behaviour, we do not know if the behaviour was actually disruptive. As social interactions are not unilateral, there is need for more studies on teacher feedback that also look at the interaction behaviour of students.

Data on teacher feedback behaviour were collected from one class discussion. It could be argued that this is not representative of the feedback behaviour of each teacher. However, Praetorius et al. (2014) found that one lesson was enough to assess stable constructs such as classroom management. Feedback behaviour, like classroom management, can be considered a stable construct. Since the class discussion was semi-standardised, we can assume that the feedback behaviour patterns of teachers were stable, so it was valid to assess on the basis of just one lesson.

This study only used peer-rated aspects of prosocial and cooperative behaviour to assess social skills, and language skills were rated by teachers. A more differentiated assessment of social skills (e.g. Denham et al. 2012), and the use of a standardised language test to assess language skills could give a more accurate assessment of student skills. This would probably reveal more diversity in the largest subgroup (the one with high language and social skill levels).

Conclusion

Two findings of this study are important for practitioners. First, we found evidence that a subgroup of students with the lowest levels of social skills is at a higher risk of peer rejection. These students need additional support to develop better prosocial and cooperative behaviour. Peer assisted learning, such as cooperative learning and peer tutoring, can foster these skills (Moeyaert et al. 2021; Topping 2000). These learning settings have also been found to boost the acceptance of students at risk of being rejected or excluded by their peers (Garrote, Dessemontet, and Opitz 2017).

Second, the at-risk subgroup was also characterised by having the highest levels of teacher feedback for incorrect social behaviour. Teachers generally made more comments about the incorrect rather than correct social behaviour of students, which means that students who are learning social rules and have difficulties in this domain receive mostly negative teacher feedback. Practitioners should be made aware that negative feedback contributes to an accumulation of negative factors leading to further social difficulties. They should be encouraged to offer more praise during class (Beaman and Wheldall 2000).

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