

# Teacher nonverbal immediacy: a validation study of the TeNOI observation scale

Tapio Toivanen, Sirke Seppänen, Sanni Pöysä, Eija Pakarinen & Marja-Kristiina Lerkkanen

**To cite this article:** Tapio Toivanen, Sirke Seppänen, Sanni Pöysä, Eija Pakarinen & Marja-Kristiina Lerkkanen (01 Sep 2025): Teacher nonverbal immediacy: a validation study of the TeNOI observation scale, Scandinavian Journal of Educational Research, DOI: [10.1080/00313831.2025.2550273](https://doi.org/10.1080/00313831.2025.2550273)

**To link to this article:** <https://doi.org/10.1080/00313831.2025.2550273>



© 2025 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group



Published online: 01 Sep 2025.



Submit your article to this journal [↗](#)



Article views: 376



View related articles [↗](#)



View Crossmark data [↗](#)

# Teacher nonverbal immediacy: a validation study of the TeNOI observation scale

Tapio Toivanen <sup>a</sup>, Sirke Seppänen <sup>a,b</sup>, Sanni Pöysä <sup>c</sup>, Eija Pakarinen <sup>d</sup> and Marja-Kristiina Lerkkanen <sup>d</sup>

<sup>a</sup>Educational Sciences, University of Helsinki, Helsinki, Finland; <sup>b</sup>Research Institute, University of the Arts Helsinki, Helsinki, Finland; <sup>c</sup>Faculty of Education and Psychology, University of Jyväskylä, Jyväskylä, Finland; <sup>d</sup>Department of Teacher Education, University of Jyväskylä, Jyväskylä, Finland

## ABSTRACT

Nonverbal immediacy has proved to be an effective communication tool in fostering student-teacher relationships. The present study aims to validate the Teacher Nonverbal Immediacy (TeNOI) observation scale in a sample of 58 teachers and their students ( $n = 1,124$ ) in lower secondary schools. Teacher emotional support and student engagement were rated from video recordings, using the Classroom Assessment Scoring System-Secondary (CLASS-S). In addition, students' experiences of situational engagement were measured at the end of each lesson. Confirmatory factor analysis confirmed TeNOI's 5-factor measurement model as satisfactory. The five factors are physical proximity, body orientation, positive head postures and smiling, eye contact and gaze, and vocal variety. Teacher nonverbal immediacy was positively associated with teacher emotional support and student engagement. Physical proximity and body orientation were positively associated with students' situational emotional engagement. The results suggest that TeNOI is a reliable and valid instrument for investigating teachers' nonverbal behavior in the classroom.

## ARTICLE HISTORY

Received 5 May 2024  
Accepted 13 August 2025

## KEYWORDS

Nonverbal immediacy; teacher; emotional support; student engagement; students' situational engagement; validation study

## 1. Introduction

According to previous studies, teacher nonverbal immediacy behavior is an area of professional expertise that leads to positive student reactions toward the teacher, teaching, and learning (e.g., McCroskey et al., 2016; Mottet et al., 2016). However, only a few observation scales exist that are designed to observe teachers' nonverbal behavior in the classroom (i.e., the Trained Raters' Perceptions of Immediacy (RI), Andersen et al., 1979; and the Nonverbal Immediacy Scale-Observer report (NIS-O), Richmond et al., 2003), but neither of them includes detailed observation instructions. Moreover, the majority of prior studies are based solely on data collected from student ratings of their teacher's nonverbal behavior in the classroom (LeBlanc Farris et al., 2018; Liu, 2021). Such information may be biased by students' own experiences or their emotions toward teachers. First, student reports may be influenced to some extent by the halo effect, given that students who like their teachers may be more prone to perceive them as more immediate (Derakhshan et al., 2023). Second, self-reports rely on participants' memory of behaviors that may not be noticed consciously, which diminishes their validity as measures of actual nonverbal immediacy behaviors (Smythe & Hess, 2005).

**CONTACT** Tapio Toivanen  tapio.toivanen@helsinki.fi  University of Helsinki, P.O.Box8, FI00014, Finland

This article has been corrected with minor changes. These changes do not impact the academic content of the article.

© 2025 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. The terms on which this article has been published allow the posting of the Accepted Manuscript in a repository by the author(s) or with their consent.

While it is evident that the school culture in the US differs from that in the Scandinavian countries (McCroskey et al., 1995; McCroskey et al., 1996; Zhang & Dewitt, 2016), specific research on teachers' nonverbal immediacy outside US classrooms is limited. However, the importance of teaching nonverbal immediacy to teacher trainees during teacher education is highlighted by McCroskey et al. (2016), who expressed concern that teachers graduate without adequate guidance in knowledge and skills related to classroom interaction. Therefore, one of the goals of this study was to develop an observation instrument to be used in preservice teacher training to guide teaching practices and promote the professional interaction skills of future teachers. To this end, the present study examined the validity of the Teacher Nonverbal Immediacy observation scale (TeNOI) and explored its association with teachers' observed emotional support and students' behavioral and situational engagement.

### **1.1. Teacher nonverbal immediacy**

Andersen et al. (1979), a pioneer in teacher nonverbal immediacy, states that people are typically drawn toward persons and things they like, and avoid or move away from things they dislike (see also Mehrabian, 1971). Based on work by Andersen and colleagues, teacher nonverbal immediacy is defined as a behavior that demonstrates availability or attentiveness, and that increases physical and psychological closeness between teacher and students (Andersen et al., 1979). A significant association has been found between teacher nonverbal immediacy and students' emotional learning, which is the process through which students learn skills that support their well-being and positive life outcomes (Weissberg et al., 2015). Andersen et al. (1979) conceptualizes a teacher's nonverbal immediacy as multivariate behavior. Previously developed measures of teacher nonverbal immediacy behaviors include all or most of the following components: reductions in proxemic distance; increase in eye contact or gaze; positive facial expressions, particularly smiles; positive head nods; increase in gestures; bodily relaxation; use of purposeful body movements; orientation of body and head toward the other interactant; vocal expressiveness, and increase in touch (e.g., Andersen et al., 1979; Gorham & Zakahi, 1990; McCroskey et al., 1996; 2004). Combining such aspects provides a versatile and authentic view of behaviors describing different nonverbal immediacy cues.

Although some nonverbal behavior is universal and probably biologically innate, it is crucial to see nonverbal immediacy as a professional skill of the teacher that can be developed and improved (Richmond et al., 2003). Richmond et al. (2003) have emphasized that a teacher's nonverbal behavior is a skill that can be practiced. The more a teacher uses forms of nonverbal immediacy, the more students like, prefer and value them (Richmond et al., 2019). It is recognized that nonverbal immediacy reduces the physical or psychological distance between teachers and students (Richmond et al., 2003). In addition, previous studies have shown that the teacher's use of immediacy behavior fosters students' affective learning, namely how students feel about what they are learning (e.g., Frymier et al., 2019), and a positive attitude toward the subject and the teacher. Such a process, in turn, typically increases students' ability to learn the material that the teacher is offering to them, and leads to higher learning motivation (McCroskey et al., 2016; Mottet et al., 2016). While prior literature is not wholly in agreement on how and why teacher immediacy is associated with student learning (Frymier et al., 2019), nonverbal immediacy is presented as a way in which teachers can attempt to influence students and their reactions while learning (Witt et al., 2010). For example, among various age groups, teacher behaviors that can be seen to reflect some aspects related to nonverbal immediacy have been shown to be positively associated with student learning, motivation, engagement, and sense of satisfaction with the teacher and the course (Allen et al., 2006; Hofkens et al., 2023; Liu, 2021; Martin & Mottet, 2011; Pakarinen et al., 2014; Pöysä et al., 2019).

### **1.2. Measuring nonverbal immediacy**

Culture has a profound influence on nonverbal behavior (Matsumoto & Hwang, 2013; Richmond et al., 2019; Santilli et al., 2011). In general, research findings indicate that students in the US perceived

a greater degree of teacher nonverbal immediacy than did students in other countries, such as China, Germany, Greece, Japan, Kenya, or Finland. Nevertheless, some nonverbal cues can be universally understood. However, Zhang and Dewitt (2016) have also pointed out that it is challenging to develop cross-cultural measures because nonverbal immediacy is a culturally bound construct. Hence, it is important to validate adapted teacher nonverbal immediacy scales in different cultures.

The previous literature includes only two studies (McCroskey et al., 1995; McCroskey et al., 1996) in which Finnish teachers' nonverbal immediacy has been examined and compared using teacher nonverbal immediacy observation measures. These studies found that teachers in Finland represent a low-expressive, non-immediate northern European culture. Matsumoto and Hwang (2013) classified cultures into expressive and reserved cultures. In a reserved culture, teachers exhibit fewer facial expressions and gestures, less eye contact, a monotonous tone of voice, rigid and closed body postures, and greater distance from the interlocutor. Tulviste et al. (2003) characterized Finnish interaction culture as silent and less talkative compared to other countries. According to McCroskey et al. (1996), Finnish teachers belong to the reserved culture. Task orientation and formality were central elements in Finnish teachers' communication culture. This is seen to differ from the American culture of interaction, the context in which the original teacher immediacy scales were developed (McCroskey et al., 1995; Zhang & Dewitt, 2016). The influence of culture on teacher-student relationships and teaching approaches should be addressed to better understand the context in which the teaching practices take place (Cheng & Chen, 2022; Pakarinen et al., 2024). Triandis (2001) introduces horizontal and vertical perspectives to understand culture. In cultures characterized by vertical individualism, such as the United States, there is a strong emphasis on standing out and being the best in comparison to others. In contrast, Finnish culture is characterized by horizontal individualism, which focuses on self-concepts that are autonomous from the group. The self is viewed as independent, yet shares fundamentally similar qualities with the selves of others.

Along with cultural differences, there is also a debate on how nonverbal immediacy should be measured. Most studies on teacher nonverbal immediacy and its effects on students have relied solely on questionnaires administered to students or teachers themselves (Liu, 2021). Richmond et al. (2003) and Smythe and Hess (2005) have expressed valid criticisms when it comes to relying on student reports, pointing out that reliability estimates for instruments measuring nonverbal immediacy based on student reports have been rather low.

When examining a teacher's nonverbal immediacy, it is important to remember that conceptual recognition of the multidimensional nature of nonverbal communication is not the same as accurately measuring all of its aspects. Classifying nonverbal immediacy into different categories helps to outline how an individual's nonverbal behavior generates messages and meanings (Richmond et al., 2019). The challenge in using various teacher nonverbal immediacy scales lies in the fact that while certain components of nonverbal behavior can be represented by a single metric relatively well, others are much more complex. For example, proximal distance (i.e., purposeful movement and placement in relation to students) can be operationalized in terms of meters and space, gaze in terms of duration and direction, body orientation and relaxation in angular changes, and closed and open body positions. However, this is not the case with highly complex and multidimensional behaviors such as gestures, tone of voice, and facial expressions in particular (Patterson & Manusov, 2006). In these aspects, measurement should focus on certain central processes mediating the consequences of nonverbal communication. The communicative perspective of a teacher's nonverbal immediacy, namely the nonverbal behaviors under the control of the teacher, can be seen as tools with which to influence the responses of students. In measuring the gestures, the focus is on the extent to which the teacher uses gestures when communicating with students. When evaluating voice, the focus is on the teacher's use of pronunciation in a variety of ways, and when measuring facial expression, it is possible to calculate whether the teacher smiles frequently.

In addition to exploring the components of nonverbal immediacy behaviors, the dimensionality of teachers' nonverbal immediacy measures has been studied. In their seminal work, Andersen et al. (1979) examined the RI scale using exploratory factor analysis (EFA), and the results suggested that

nonverbal immediacy is a unidimensional construct. Moreover, Richmond et al. (2003) employed EFA when developing the NIS-O observation instrument, with results indicating a single-factor solution. However, when employing a forced orthogonal (varimax) eight-factor rotation, the eight factors obtained were consistent with the eight different nonverbal behaviors being measured. In line with this, Aydin et al. (2013) reported that they could not confirm the single-factor structure of the NIS-O, but their factor analysis produced a seven-factor structure for the observation instrument. Furthermore, there are numerous studies in the literature that have validated retrospective student reports on their teachers' nonverbal immediacy (e.g., Zhang et al. 2007) or teachers' self-reports (e.g., Puertas-Molero et al., 2022). However, the present study adds to the existing literature by validating the observation instrument that employs trained raters.

### **1.3. The aim of the present study**

The main aim of this study was to examine the factor structure of the TeNOI using a sample of teachers from secondary schools. We also aimed to study the association between the teachers' nonverbal immediacy and their emotional support (measured using the CLASS-S observation tool), as well as the relation between the teachers' nonverbal immediacy and student engagement, measured using the CLASS-S and In Situations (InSitu) Instrument (Lerkkanen et al., 2012; Vasalampi et al., 2016). To this end, the research sought to address the following questions: (1) What is an adequate TeNOI factor structure to describe the teachers' nonverbal immediacy? (2) How are the TeNOI factors associated with the observed teachers' emotional support and student engagement? and (3) How are the TeNOI factors associated with students' self-reported situational engagement?

## **2. Method**

### **2.1. Participants and procedure**

This study was part of a longitudinal follow-up study (First Steps study, Lerkkanen et al., 2006–2016), which comprised approximately 2,000 students along with their parents and teachers. The data were collected in four municipalities in different parts of Finland. The Committee of Ethics at the University of Jyväskylä provided ethical approval for the study before collecting the data, and only voluntary teachers who provided written consent for their participation, and students whose guardians had provided written consent for their child's voluntary participation, were involved in the study.

The participants of the present study were 58 subject teachers from 23 lower secondary schools and 1,124 of their Grade 7 students (average 13- to 14-year-olds). The average size of the class was 18.34 ( $SD = 4.25$ ) students. Most of the participating teachers (98.2%) had master's degrees and were qualified to work as subject teachers. Almost half of the participating teachers (48.3%) had more than 15 years of work experience, 29.6% had 5–15 years, and 18.5% had less than five years of work experience.

The data consisted of video recordings of 70 lessons. Video-recorded lessons comprised mainly Finnish language and literacy (29% of the lessons) and mathematics (20%), while the remainder (51% in total) covered English, Swedish, history, religion, physics and chemistry, pupil counselling, health education, home economics, visual arts, music, crafts (textile), and sports. Most of the lessons (87%) lasted 45 min, while the remainder lasted 75 min. The video-recorded lessons were coded for teacher nonverbal immediacy with the Trained Raters' Perceptions of Immediacy (RI) scale (Andersen et al., 1979) (Finnish translation by first author), and for teacher-student interactions using the Classroom Assessment Scoring System – Secondary (CLASS-S, Pianta et al., 2012; Finnish validation by Virtanen et al., 2018) observational tool. Before coding, the 45-minute video recordings were divided into three cycles and the 75-minute videos into five cycles (209 cycles in total, ranging from 9:53 to 16:10 min depending on the total length of the lesson).

## 2.2. Measures

### 2.2.1. Nonverbal immediacy

Teachers' nonverbal immediacy in the video-recorded lessons was measured using a modified version of the Trained Raters' Perceptions of Immediacy (RI) scale (Andersen et al., 1979), which was translated into Finnish by the first author. Nine indicators out of the original eleven were used in the current study. The original indicator "general immediacy" was omitted because we decided that the combined score of the indicators would effectively describe this phenomenon. Additionally, indicators of body position (tense – relaxed and closed – open) were both included but combined into a single indicator, "relaxed body posture". This change was based on Mehrabian's (1971) observation that relaxed behavior includes bodily openness, which is also reflected in a decrease in tension in the hands and feet. These modifications to the original scale were made after pre-testing the (RI) scale with Finnish video material (8 lessons) by two independent observers. The modified nine-indicator observation scale included the following indicators: purposeful positioning in relation to students (far – close), purposeful movement in the classroom (does not move in space – moves a lot and intentionally), body orientation (not directed to students – directed to students), relaxed body posture (tense and closed body positions – relaxed and open body positions), gestures (none or very few gestures supporting interaction – many gestures supporting interaction), positive head nods (none or very few positive head gestures – many positive head gestures), smiling (none or very few positive facial expressions and smiles – many positive facial expressions and smiles), eye contact and gaze (none or very few eye contacts to the student group or individual students – much eye contact to the student group or individual students) and vocal variety (not much variation in use of voice – variable use of voice). The original 9-point scale was also changed to a 7-point scale (Low 1–2, Mid 3–5, or High 6–7), which was similar to the CLASS-S observational tool (Pianta et al., 2012).

The first author further evaluated whether some of the nine factors of the modified RI scale could be combined to create a novel teachers' nonverbal immediacy observation measure with a more compact structure. As a result of theoretical analysis (e.g., Richmond et al., 2019), the following structure was established: purposeful positioning in relation to students and purposeful movement in the classroom were combined as physical proximity. Body orientation, relaxed body posture and gestures were combined as body orientation. Positive head nods and smiling were combined as positive head postures and smiling. Eye contact and gaze, and vocal variety remained as their own indicators. This modified version of the measure was named as TeNOI, and it observed teachers' nonverbal immediacy through five factors: physical proximity, body orientation, positive head postures and smiling, eye contact and gaze, and vocal variety. The present study was set out to examine the factor structure of the TeNOI.

Before coding, the three observers studied the observation guidelines. They also participated in a training session that was organized to ensure the reliability of the coding. During the actual coding, the observers had to reach 80% agreement within 1 scale point, which is typically considered to reflect an acceptable degree of accuracy (see Pianta et al., 2012). A total of 20% of observed lessons were double-coded by two independent observers to calculate interrater reliability. Interrater reliability between the pairs of observers was determined by calculating intraclass correlations (ICCs, Landers, 2015). To calculate ICCs, we used a two-way mixed effect model (measure fixed, observers random), the absolute agreement definition, and the average measure intraclass correlation (which assumes no interaction effect). Intraclass correlations showed high interrater reliability (.94) with a 95% confidence interval from .93 to .95.

### 2.2.2. Observed emotional support and student engagement

The quality of emotional support and student engagement in the video-recorded lessons was measured with the CLASS-S observational tool (Pianta et al., 2012), which has been validated in the Finnish context (Virtanen et al., 2018). The CLASS-S is a measure that operationalizes the

conceptual views presented in the Teaching Through Interactions (TTI) framework (Hafen et al., 2015; Hamre et al., 2013). Based on the TTI, the CLASS-S consists of three domains (i.e., Emotional Support, Classroom Organization, and Instructional Support), and one separate dimension that captures student engagement during the observed cycle. Based on the research questions set for the present study, only the Emotional Support domain, consisting of three dimensions (Positive Climate, Teacher Sensitivity, and Regard for Adolescent Perspectives), and a separate dimension measuring Student Engagement were used in the present study. Cronbach's alpha reliability for Emotional Support was .79 in the sample of the present study.

Teacher-student interactions were coded with CLASS-S for each individual cycle by evaluating dimensions separately with a 7-point scale (Low 1–2, Mid 3–5, or High 6–7) based on the indicators of effective interactions and observable behavioral markers provided in the CLASS-S manual (Pianta et al., 2012). Prior to the coding process, the observers participated in comprehensive training sessions during which they were required to reach 80% agreement within 1 scale point, which is considered to reflect an acceptable degree of accuracy (see Pianta et al., 2008). During the actual coding of the video-recorded lessons collected in the First Steps study, up to 20% of all recorded lessons were double-coded by two independent observers to calculate interrater reliability. The interrater reliability was high, as reported in a previous study (Pöysä et al., 2019).

### **2.2.3. Students' situational engagement**

Students' experiences of situational engagement were measured with a mobile-based In Situations (InSitu) Instrument (Lerkkanen et al., 2012; Vasalampi et al., 2016). The InSitu Instrument consists of 17 items rated on a five-point scale (1 = *not at all*; 5 = *very much*). The complete InSitu Instrument consists of five factors, but based on the research questions for the present study, only three out of five were used: behavioral/cognitive engagement (7 items, e.g., "How persistent were you in studying during the lesson?"; "How important did you find the studied content?"); emotional engagement (3 items, e.g., "How much did you like the lesson?"); and disaffection (3 items, e.g., "How boring was the lesson?"). Participating students were asked to rate their experiences at the end of each video-recorded lesson, and to evaluate their experiences considering the whole lesson. The mean values of students' ratings for the factors under consideration were calculated for each of the observed lessons. Cronbach's alpha reliability for Students' situational engagement was .83 in the sample of the present study.

## **2.3. Data analysis**

We used IBM's SPSS for Windows (version 28) and IBM's SPSS AMOS (version 28) for all statistical analyses. A confirmatory factor analysis (CFA) was performed to validate the new five-factor measurement model for TeNOI. Multiple fit indices were used to estimate the model fit, applying the following criteria (Hu & Bentler, 1999): the ratio of chi-square to degrees of freedom ( $\chi^2/df$ , <5); the Comparative Fit Index (CFI, >0.90); the Tucker-Lewis Index (TLI, >0.90); the root mean square error of approximation (RMSEA, <0.06); and the standardized root mean square residual (SRMR, <0.05). In addition, we examined the correlations between teachers' nonverbal immediacy and teachers' observed emotional support (measured using CLASS-S), as well as the correlation between teachers' nonverbal immediacy and student engagement (measured using CLASS-S and the InSitu Instrument).

## **3. Results**

### **3.1. Descriptive statistics**

Descriptive statistics for teachers' nonverbal immediacy, observed emotional support, student engagement, and students' self-reported situational engagement are shown in [Table 1](#).

### 3.2. Confirmatory factor analysis

After fixing the variance of error terms to zero (0) for the two single-item indicators (Eye contact and gaze and Vocal variety), CFA confirmed the hypothesized five-factor structure of TeNOI, as illustrated in Figure 1: 1. Physical proximity (2 items), 2. Body orientation (3 items), 3. Positive head postures and smiling (2 items), 4. Eye contact and gaze (1 item), and 5. Vocal variety (1 item). This five-factor measurement model demonstrated a satisfactory model fit ( $\chi^2/df = 5.18$ , CFI = 0.96, TLI = 0.93, SRMR = 0.04), excluding RMSEA = 0.13, which failed to reach the accepted level of less than 0.05.

### 3.3. Correlations between teacher nonverbal immediacy, emotional support and student engagement

The relationship between teacher nonverbal immediacy, teacher emotional support and student engagement (both observed and self-reported situational engagement) was determined using Spearman's rank correlation coefficient. A positive association was observed between nonverbal immediacy and teacher emotional support ( $r(68) = .55, p < .001$ ), as well as between nonverbal immediacy and the dimensions of emotional support (positive climate, sensitivity and regard for students' perspectives, Table 2). Teachers' nonverbal immediacy and observed student engagement were positively associated ( $r(68) = .45, p < .001$ , Table 2), while no statistically significant association was observed between teachers' nonverbal immediacy and students' situational engagement (behavioral and cognitive engagement, emotional engagement, and disaffection,  $p > .05$  for all, Table 2). However, a positive association was observed between students' situational emotional engagement and two dimensions of teachers' nonverbal immediacy, that is, physical proximity ( $r(66) = .30, p = .016$ ) and body orientation ( $r(66) = .24, p = .048$ ) (Table 2). All dimensions of the teachers' nonverbal immediacy were positively associated with the dimensions of emotional support (Table 2).

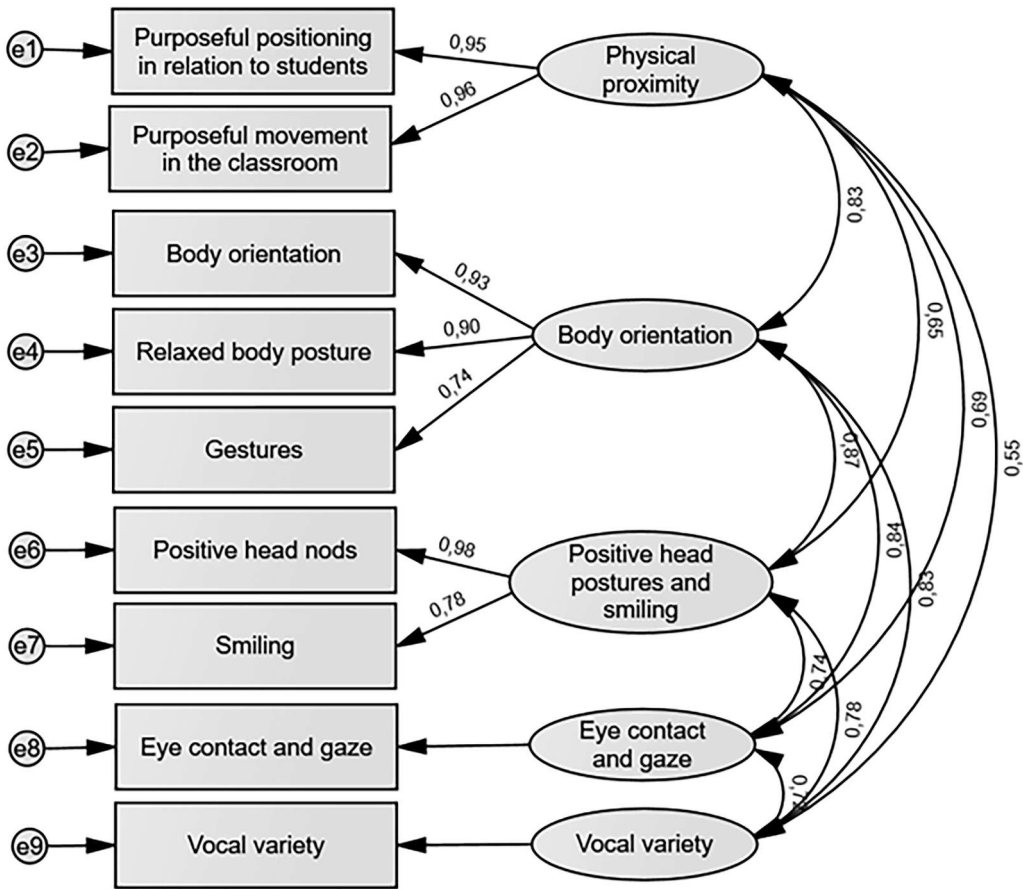
In addition, we examined the associations in more detail by dividing the values of nonverbal immediacy into upper and lower categories using a median split (Table 3).

Within the lower category (Table 3), no statistically significant associations were observed between teachers' nonverbal immediacy and teacher emotional support, observed student engagement or students' situational engagement (all  $p$ 's  $> .05$ ). Within the higher category (Table 3), teachers' nonverbal immediacy was positively associated with teacher emotional support ( $r(34) = .38, p < .05$ ), positive climate ( $r(34) = .36, p < .05$ ) and situational emotional engagement ( $r(33) = .42, p$

**Table 1.** Descriptive statistics.

	<i>N</i>	Minimum	Maximum	Mean	Std. Deviation
Nonverbal immediacy (TeNOI) <sup>a</sup>	70	1.67	6.71	4.53	1.22
Physical proximity	70	1.50	7.00	4.56	1.40
Eye contact and gaze	70	1.00	7.00	4.56	1.31
Body orientation	70	2.72	7.00	4.90	1.11
Positive head postures and smiling	70	1.00	7.00	4.17	1.62
Vocal variety	70	1.00	7.00	4.52	1.28
Emotional support (CLASS-S) <sup>b</sup>	70	1.67	6.33	4.42	0.82
Positive climate	70	2.00	6.67	4.86	0.96
Sensitivity	70	2.00	7.00	5.44	0.97
Regard for students' perspectives	70	1.00	6.00	2.95	0.99
Student engagement (CLASS-S) <sup>b</sup>	70	2.00	6.67	5.13	0.79
Students' situational engagement (InSitu) <sup>c</sup>					
Situational behavioral and cognitive engagement	68	2.24	4.12	3.13	0.37
Situational emotional engagement	68	1.83	4.33	3.01	0.51
Situational disaffection	68	1.67	3.67	2.35	0.34

Note. <sup>a</sup>Measured with the Teacher Nonverbal Immediacy Observation Scale, range 1–7. <sup>b</sup>Measured with the Classroom Assessment Scoring System–Secondary, range 1–7. <sup>c</sup>Measured with the In Situations Instrument, range 1–5.



**Figure 1.** The five-factor measurement model of the Teacher Nonverbal Immediacy observation scale (TeNOI). The small circles on the left signify the error terms, the rectangles provide the original indicators, and the ovals signify the TeNOI factors. Factor loadings are depicted with arrows from factors to indicators, and the curved multidirectional arrows on the right indicate the correlations between factors.

< .05). In addition, a negative association was observed between teachers' nonverbal immediacy and situational disaffection ( $r(33) = -.35, p < .05$ ).

#### 4. Discussion

The present study aimed to contribute to the field by examining the factor structure and validity of the novel Teacher Nonverbal Immediacy Observation Scale (TeNOI). In addition, the study investigated whether teachers' nonverbal immediacy measured using TeNOI was associated with the observed emotional support and student engagement. Since the original 11-factor model of the RI may not fully reflect teacher nonverbal immediacy in the Finnish low immediacy context, the first author evaluated whether some indicators of the RI scale could be combined to create a new observation measure with a more compact structure, and subsequently constructed a new immediacy scale in which the original eleven indicators of the Trained Raters' Perceptions of Immediacy (RI) were clustered into five factors.

The TeNOI observation scale included the following factors: distance and purposeful movement, body and gestures, facial expressions and head movements, eye contact and gaze, and voice. The observed video material indicated that most of the teachers remained in front of the class and

**Table 2.** Spearman Correlations between TeNOI (N = 70), CLASS-S (N = 70) and Insitu (N = 68) scales.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Nonverbal immediacy <sup>a</sup>	–													
2. Physical proximity <sup>a</sup>	0.87**	–												
3. Eye contact and gaze <sup>a</sup>	0.87**	0.74**	–											
4. Body orientation <sup>a</sup>	0.93**	0.76**	0.82**	–										
5. Positive head postures and smiling <sup>a</sup>	0.79**	0.70**	0.74**	0.78**	–									
6. Vocal variety <sup>a</sup>	0.55**	0.53**	0.75**	0.79**	0.70**	–								
7. Emotional support <sup>b</sup>	0.56**	0.42**	0.50**	0.51**	0.51**	0.45**	–							
8. Positive climate <sup>b</sup>	0.37**	0.40**	0.46**	0.49**	0.56**	0.44**	0.85**	–						
9. Sensitivity <sup>b</sup>	0.43**	0.24*	0.41**	0.36**	0.39**	0.36**	0.78**	0.58**	–					
10. Regard for students' perspectives <sup>b</sup>	0.45**	0.42**	0.38**	0.44**	0.30*	0.29*	0.76**	0.52**	0.33**	–				
11. Student engagement <sup>b</sup>	0.21	0.33**	0.47**	0.38**	0.43**	0.43**	0.63**	0.66**	0.51**	0.39**	–			
12. Situational emotional engagement <sup>c</sup>	0.14	0.29*	0.14	0.24*	0.09	0.09	0.22	0.11	0.10	0.32**	0.29*	–		
13. Situational behavioral and cognitive engagement <sup>c</sup>	0.14	0.18	0.10	0.17	0.06	0.08	0.26*	0.15	0.24*	0.23	0.30*	0.81**	–	
14. Situational disaffection <sup>c</sup>	–0.17	–0.23	–0.09	–0.20	–0.07	–0.05	–0.04	–0.02	–0.04	–0.09	–0.17	–0.54**	–0.39**	–

**Table 3.** Spearman correlations across the categories of teachers' nonverbal immediacy between TeNOI (Lower  $N = 34$ , Higher  $N = 36$ ), CLASS-S (Lower  $N = 34$ , Higher  $N = 36$ ) and Insitu (Lower  $N = 33$ , Higher  $N = 35$ ) values.

		1	2	3	4	5	6	7	8	9
Lower	1. Nonverbal immediacy <sup>a</sup>	–								
	2. Emotional support <sup>b</sup>	0.30	–							
	3. Positive climate <sup>b</sup>	0.27	0.84**	–						
	4. Sensitivity <sup>b</sup>	0.28	0.79**	0.51**	–					
	5. Regard for students' perspectives <sup>b</sup>	0.24	0.72**	0.49**	0.31	–				
	6. Student engagement <sup>b</sup>	0.26	0.49**	0.55**	0.43*	0.22	–			
	7. Situational emotional engagement <sup>c</sup>	–0.15	0.12	–0.04	0.02	0.29	0.31	–		
	8. Situational behavioral and cognitive engagement <sup>c</sup>	–0.05	0.31	0.05	0.35*	0.30	0.34	0.86**	–	
9. Situational disaffection <sup>c</sup>	0.16	0.19	0.24	0.20	0.04	–0.10	–0.44*	–0.37*	–	
Higher	1. Nonverbal immediacy <sup>a</sup>	–								
	2. Emotional support <sup>b</sup>	<b>0.38*</b>	–							
	3. Positive climate <sup>b</sup>	<b>0.36*</b>	0.81**	–						
	4. Sensitivity <sup>b</sup>	0.18	0.69**	0.48**	–					
	5. Regard for students' perspectives <sup>b</sup>	0.31	0.78**	0.47**	0.23	–				
	6. Student engagement <sup>b</sup>	0.21	0.60**	0.59**	0.45**	0.43**	–			
	7. Situational emotional engagement <sup>c</sup>	<b>0.42*</b>	0.24	0.18	0.06	0.31	0.25	–		
	8. Situational behavioral and cognitive engagement <sup>c</sup>	0.28	0.17	0.16	0.06	0.15	0.21	0.72**	–	
	9. Situational disaffection <sup>c</sup>	<b>–0.35*</b>	–0.17	–0.16	–0.17	–0.16	–0.23	–0.63**	–0.35*	–

Note. \* $p < .05$ . \*\* $p < .01$ . <sup>a</sup> Measured with the Teacher Nonverbal Immediacy Observation Scale, range 1–7. <sup>b</sup> Measured with the Classroom Assessment Scoring System–Secondary, range 1–7. <sup>c</sup> Measured with the In Situations Instrument, range 1–5.

moved little toward the students. These observations can be explained by the fact that Northern European countries belong to a less immediate, no-contact culture, where people generally keep more distance from their interlocutors. Distance and purposeful movement were combined in the TeNOI observation scale as Physical proximity. The observed teachers did not exhibit many purposeful hand gestures or smiles, which is typical of a reserved culture (Matsumoto & Hwang, 2013). Gestures were combined in TeNOI with body postures, and smiling was combined with positive head postures (e.g., Richmond et al., 2019). These observations were also supported by McCroskey et al.'s (1995, 1996) research results, according to which Finns were less immediate due to their cultural interaction habits.

The results of the CFA confirmed the five-factor measurement model for TeNOI. Our findings indicate that the five factors of teacher nonverbal immediacy, namely physical proximity (distance and purposeful movement), body orientation (purposeful gestures and body posture), eye contact and gaze (duration and direction), positive head postures and smiling (smiles and nods), and vocal variety aptly reflect teacher nonverbal immediacy in the Finnish lower secondary school context. The Finnish school culture differs from that in the US, where the impact of teacher nonverbal immediacy has been studied the most. For this reason, it is important to identify variations in the effects of instructor immediacy based on the culture of instructors (Zhang & Dewitt, 2016; McCroskey et al., 1995; 1996).

This study advances the previous research on teacher nonverbal immediacy by providing a compact and validated observation instrument that can be used by trained raters. The measurement model of previous observation instruments, namely the Trained Raters' Perceptions of Immediacy (RI, Andersen et al., 1979) and the Nonverbal Immediacy Scale–Observer report (NIS-O, Richmond et al., 2003), was obtained using exploratory factor analyses, whereas this study employed confirmatory factor analysis to further validate the TeNOI measurement model. To our knowledge, no previous CFA studies have been conducted to validate teacher nonverbal immediacy observation instruments aimed at trained observers. Other measures, such as teacher self-evaluation scales or

student reports on their teachers' nonverbal immediacy have been examined using EFA or CFA across various educational and cultural contexts (e.g., Derakhshan et al., 2023; Smythe & Hess, 2005; Zhang et al. 2007). However, we focused on developing an observation instrument for trained observers to avoid the common limitations of self-reports. Therefore, the precise instructions included in TeNOI, along with comprehensive training in observing behavioral markers of nonverbal immediacy, will provide future research with the possibility to obtain more comparable research results.

Earlier studies have shown that teacher nonverbal immediacy has been positively associated with learning, motivation and engagement of learners of different ages, and satisfaction with the teacher and the course (e.g., Allen et al., 2006; Liu, 2021; Martin & Mottet, 2011; Richmond et al., 2017; 2019; Roorda et al., 2011; Stamatis & Kostoula, 2021).

In this study, teacher emotional support was observed using CLASS-S, a research-based observation system designed to examine teacher-student interaction in all classroom settings and across any curriculum (Hafen et al., 2015; Hamre et al., 2013). It defines teaching quality through the lens of effective classroom interactions (Hamre et al., 2013). Our results show that teacher nonverbal immediacy is positively associated with teacher emotional support, as defined and observed with the CLASS-S measure. All five factors of TeNOI showed moderate positive associations with all three dimensions of teacher emotional support (positive climate, sensitivity, and regard for students' perspectives). In addition, two factors of TeNOI, physical proximity and body orientation, were positively associated with student-reported situational emotional engagement measured using the InSitu Instrument. Furthermore, when we divided nonverbal immediacy scores into lower and higher categories, we observed significant correlations only in the higher category, wherein nonverbal immediacy was positively associated with emotional support, positive climate and situational emotional engagement, and negatively associated with students' situational disaffection. From a slightly different perspective, these results confirm the findings of previous research, which show that teacher nonverbal immediacy behavior is connected to students' affective learning (e.g., Frymier et al., 2019).

Teaching practice plays a special role in teacher pre-service education by strengthening the connection between theory and practice. The anticipated direction of this TeNOI validation process was to develop an observation tool that can also be used in teacher education, particularly to guide teaching practices and promote the professional interaction skills of future teachers. The importance of teaching topics related to nonverbal immediacy in teacher education is highlighted by McCroskey et al. (2016). According to Richmond et al. (2019), communication researchers have realized the relevance of nonverbal communication in the classroom environment, pointing out that the primary function of teachers' nonverbal behavior is to improve students' attachment to teaching. In their study, they found nonverbal behavior to be an effective way to improve the quality of student-teacher relationships. Thus, teachers should be trained to use nonverbal communication in the classroom more effectively. To this end, the TeNOI observation system, together with the supporting video and instructional material, can be used in teaching practice to make teacher trainees more aware of the possible impact of their nonverbal behavior, and even to train their nonverbal skills. Thanks to its compact observation structure, TeNOI is easy for both supervisors and teacher trainees to use during teaching practice, as teacher trainers can observe and provide their trainees with specific and relevant feedback on either one aspect (e.g., space and purposeful movement) or all aspects of nonverbal immediacy at a time.

Some limitations of this study require consideration. First, the study used video observations, which may have led to certain behavioral details being overlooked compared to live observations. Second, students' situational engagement was averaged at the classroom level, potentially neglecting the variability of students' perspectives across lessons. Third, the sample size was somewhat small for CFA, as only 70 lessons were examined using the new TeNOI measure. Fourth, participation in the study was voluntary, raising the possibility that the sample may not be representative of all

Finnish teachers. Finally, observations were limited to teachers from lower secondary schools. Future research should involve teachers from different grade levels.

## 5. Conclusions

This study presents the first evidence of the validity of the Teacher's Nonverbal Immediacy observation scale (TeNOI) as a tool for observing teacher nonverbal behavior and obtaining information about daily interactions in Finnish lower secondary school classrooms. The TeNOI five-factor measurement model can capture teachers' nonverbal immediacy behaviors and it relates meaningfully to constructs measured with other observation instruments. It is important to be able to observe this aspect of teachers' professional competence because research has shown that there are significant advantages to be gained from a teacher's nonverbal immediacy in the classroom.

## Acknowledgements

We would like to express heartfelt thanks to the teachers and students in the present study, who shared their teaching and learning process with us. The project has been supported by the EDUCA Flagship funding from the Research Council of Finland (nro 358924) and by grants from Ministry of Education and Culture (Grant numbers: OKM/39/523/2017, OKM/79/592/2018).

## Disclosure statement

No potential conflict of interest was reported by the author(s).

## Funding

This work was supported by Opetus- ja Kulttuuriministeriö [grant number OKM/39/523/2017, OKM/79/592/2018]; Strategic Research Council (SRC) established within the Research Council of Finland [grant number 345196, 353392, and 352648]; Academy of Finland [grant number 213486, 263891, 268586]; EDUCA Flagship funding from the Research Council of Finland [grant number 358924].

## ORCID

Tapio Toivanen  <http://orcid.org/0009-0003-3199-5645>

Sanni Pöysä  <http://orcid.org/0000-0002-5059-9459>

Marja-Kristiina Lerkkanen  <http://orcid.org/0000-0002-5709-5800>

## References

- Allen, M., Witt, P. L., & Wheelless, L. R. (2006). The role of teacher immediacy as a motivational factor in student learning: Using meta-analysis to test a causal model. *Communication Education*, 55(1), 21–31. <https://doi.org/10.1080/03634520500343368>
- Andersen, J. F., Andersen, P. A., & Jensen, A. D. (1979). The measurement of nonverbal immediacy. *Journal of Applied Communication Research*, 7(2), 153–180. <https://doi.org/10.1080/00909887909365204>
- Aydin, M. D., Miller, J. K., Xiaojun, Y., Menteş, T., & Leblebici, D. N. (2013). Nonverbal immediacy and perception of learning: A cross-cultural survey in Turkey, USA and China. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi (H. U. Journal of Education)*, 44, 27–42.
- Cheng, H. Y., & Chen, L. (2022). Investigating how student-centered and teacher-centered teaching paradigms relate to the academic motivation and learning behaviors of secondary school students in China (*Explorando las relaciones entre los modelos pedagógicos centrados en el estudiante y centrados en el docente y la motivación académica y conductas de aprendizaje de los estudiantes de secundaria en China*). *Journal for the Study of Education and Development: Infancia y Aprendizaje*, 45(4), 906–938. <https://doi.org/10.1080/02103702.2022.2096299>

- Derakhshan, A., Zhang, L. J., & Zhaleh, K. (2023). The effects of instructor clarity and non-verbal immediacy on Chinese and Iranian EFL students' affective learning: The mediating role of instructor understanding. *Studies in Second Language Learning and Teaching*, 13(1), 71–100. <https://doi.org/10.14746/ssl.31733>
- Frymier, A. B., Goldman, Z. W., & Claus, C. J. (2019). Why nonverbal immediacy matters: A motivation explanation. *Communication Quarterly*, 67(5), 526–539. <https://doi.org/10.1080/01463373.2019.1668442>
- Gorham, J., & Zakahi, W. R. (1990). A comparison of teacher and student perceptions of immediacy and learning: Monitoring process and product. *Communication Education*, 39(4), 354–368. <https://doi.org/10.1080/03634529009378815>
- Hafen, C. A., Hamre, B., Allen, J. P., Courtney, A. B., Gitomer, D. H., & Pianta, R. C. (2015). Teaching through interactions in secondary school classrooms: Revisiting the factor structure and practical application of the classroom assessment scoring system – secondary. *The Journal of Early Adolescence*, 35(5-6), 651–680. <https://doi.org/10.1177/0272431614537117>
- Hamre, B. K., Pianta, R. C., Downer, J. T., DeCoster, J., Mashburn, A. J., Jones, S. M., Brown, J. L., Cappella, E., Atkins, M., Rivers, S. E., Brackett, M. A., & Hamagami, A. (2013). Teaching through interactions: Testing a developmental framework of teacher effectiveness in over 4,000 classrooms. *The Elementary School Journal*, 113(3), 461–487. <https://doi.org/10.1086/669616>
- Hofkens, T., Pianta, R. C., & Hamre, B. (2023). Teacher-student interactions: Theory, measurement, and evidence for universal properties that support students' learning across countries and cultures. In R. Maulana, M. Helms-Lorenz, & R. M. Klassen (Eds.), *Effective teaching around the world* (pp. 399–422). Springer. [https://doi.org/10.1007/978-3-031-31678-4\\_18](https://doi.org/10.1007/978-3-031-31678-4_18)
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6(1), 1–55. <https://doi.org/10.1080/10705519909540118>
- Landers, R. N. (2015). Computing intraclass correlations (ICC) as estimates of interrater reliability in SPSS. *The Winnower*, 4, e143518.81744. <https://doi.org/10.15200/winn.143518.81744>
- LeBlanc Farris, K., Houser, M. L., & Hosek, A. M. (2018). Historical roots and trajectories of instructional communication. In M. L. Houser & A. M. Hosek (Eds.), *Handbook of instructional communication: Rhetorical and relational perspectives* (pp. 1–20). Routledge. <https://doi.org/10.4324/9781315189864>
- Lerikkanen, M.-K., Niemi, P., Poikkeus, A.-M., Poskiparta, E., Siekkinen, M., & Nurmi, J.-E. (2006–2016). *The first steps study [Alkuportaati]*. University of Jyväskylä.
- Lerikkanen, M.-K., Vasalampi, K., & Nurmi, J.-E. (2012). *Insituations (InSitu) instrument*. University of Jyväskylä.
- Liu, W. (2021). Does teacher immediacy affect students? A systematic review of the association between teacher verbal and non-verbal immediacy and student motivation. *Frontiers in Psychology*, 12, 713978. <https://doi.org/10.3389/fpsyg.2021.713978>
- Martin, L., & Mottet, T. P. (2011). The effect of instructor nonverbal immediacy behaviors and feedback sensitivity on Hispanic students' affective learning outcomes in ninth-grade writing conferences. *Communication Education*, 60(1), 1–19. <https://doi.org/10.1080/03634523.2010.496868>
- Matsumoto, D., & Hwang, H. C. (2013). Assessing cross-cultural competence: A review of available tests. *Journal of Cross-Cultural Psychology*, 44(6), 849–873. <https://doi.org/10.1177/0022022113492891>
- McCroskey, J. C., Fayer, J. M., Richmond, V. P., Sallinen, A., & Barraclough, R. A. (1996). A multi-cultural examination of the relationship between nonverbal immediacy and affective learning. *Communication Quarterly*, 44(3), 297–307. <https://doi.org/10.1080/01463379609370019>
- McCroskey, J. C., McCroskey, L. L., & Richmond, V. P. (2016). Nonverbal communication in instructional context. In M. L. Patterson & V. L. Manusov (Eds.), *Handbook of nonverbal communication* (pp. 364–377). The SAGE Publications.
- McCroskey, J. C., Richmond, V. P., Sallinen, A., Fayer, J. M., & Barraclough, R. A. (1995). A cross-cultural and multi-behavioral analysis of the relationship between nonverbal immediacy and teacher evaluation. *Communication Education*, 44(4), 281–291. <https://doi.org/10.1080/03634529509379019>
- McCroskey, J. C., Valencic, K. M., & Richmond, V. P. (2004). Toward a general model of instructional communication. *Communication Quarterly*, 52(3), 197–210. <https://doi.org/10.1080/01463370409370192>
- Mehrabian, A. (1971). *Silent messages*. Wadsworth Publishing Company.
- Mottet, T. P., Richmond, V. P., & McCroskey, J. C. (2016). *Handbook of instructional communication: Rhetorical and relational perspectives*. Pearson/Allyn & Bacon.
- Pakarinen, E., Aunola, K., Kiuru, N., Lerikkanen, M.-K., Poikkeus, A.-M., Siekkinen, M., & Nurmi, J.-E. (2014). The cross-lagged associations between classroom interactions and children's achievement behaviors. *Contemporary Educational Psychology*, 39(3), 248–261. <https://doi.org/10.1016/j.cedpsych.2014.06.001>
- Pakarinen, E., Imai-Matsumura, K., Yada, A., Yada, T., Leppänen, A., & Lerikkanen, M.-K. (2024). Child-centered and teacher-directed practices in two different countries: A descriptive case study in Finnish and Japanese Grade 1 classrooms. *Journal of Research in Childhood Education*, 38(1), 30–49. <https://doi.org/10.1080/02568543.2023.2188059>

- Patterson, M. L., & Manusov, V. (Eds.). (2006). Nonverbal communication: Basic issues and future prospects. In *The SAGE handbook of nonverbal communication*. Sage Publication.
- Pianta, R. C., Belsky, J., Vandergrift, N., Houts, R., & Morrison, F. J. (2008). Classroom effects on children's achievement trajectories in elementary school. *American Educational Research Journal*, 45(2), 365–397. <https://doi.org/10.3102/0002831207308230>
- Pianta, R. C., Hamre, B. K., & Mintz, S. (2012). *Classroom assessment scoring system – secondary manual*. Teachstone.
- Pöysä, S., Vasalampi, K., Muotka, J., Lerkkanen, M.-K., Poikkeus, A.-M., & Nurmi, J.-E. (2019). Teacher-student interaction and lower secondary school students' situational engagement. *British Journal of Educational Psychology*, 89(2), 374–392. <https://doi.org/10.1111/bjep.12244>
- Puertas-Molero, P., Zurita-Ortega, F., González-Valero, G., & Ortega-Martín, J. L. (2022). Design and validation of the Non-Verbal Immediacy Scale (NVIS) for the evaluation of non-verbal language in university professors. *International Journal of Environmental Research and Public Health*, 19(3), Article 3. <https://doi.org/10.3390/ijerph19031159>
- Richmond, V. P., Houser, M. L., & Hosek, A. (2017). Immediacy and the teacher-student relationship. In L. Houser & A. M. Hosek (Eds.), *Handbook of instructional communication: Rhetorical and relational perspectives* (pp. 97–111). Routledge. <https://doi.org/10.4324/9781315189864>
- Richmond, V. P., McCroskey, J. C., & Hickson, M. L., III. (2019). *Nonverbal behavior in interpersonal relations. (7th edition) – eTextbook*. <https://fliphtml5.com/ztpxj/jidf/basic>
- Richmond, V. P., McCroskey, J. C., & Johnson, A. D. (2003). Development of the nonverbal immediacy scale (NIS): Measures of self-and other-perceived nonverbal immediacy. *Communication Quarterly*, 51(4), 504–517. <https://doi.org/10.1080/01463370309370170>
- Roorda, D. L., Koomen, H. M. Y., Spilt, J. L., & Oort, F. J. (2011). The influence of affective teacher student relationships on students' school engagement and achievement: A meta-analytic approach. *Review of Educational Research*, 81(4), 493–529. <https://doi.org/10.3102/0034654311421793>
- Santilli, G., Almaraz, E., Brendel, C., Choi, U., Beilin, C., Blundell, M. P., Haria, S., Parsley, K. L., Kinnon, C., Malech, H. L., Bueren, J. A., Grez, M., & Thrasher, A. J. (2011). Biochemical correction of X-CGD by a novel chimeric promoter regulating high levels of transgene expression in myeloid cells. *Molecular Therapy*, 19(1), 122–132. <https://doi.org/10.1038/mt.2010.226>
- Smythe, M.-J., & Hess, J. A. (2005). Are student self-reports a valid method for measuring teacher nonverbal immediacy? *Communication Education*, 54(2), 170–179. <https://doi.org/10.1080/03634520500213389>
- Stamatis, P. J., & Kostoula, V. E. (2021). Nonverbal immediacy in teaching process: A case study in secondary education. *European Journal of Education and Pedagogy*, 2(1), 20–24. <https://doi.org/10.24018/ejedu.2021.2.1.25>
- Triandis, H. C. (2001). Individualism and collectivism: Past, present, and future. In D. Matsumoto (Ed.), *The handbook of culture and psychology* (pp. 35–50). Oxford University Press.
- Tulviste, T., Mizera, L., De Geer, B., & Tryggvason, M.-T. (2003). A silent Finn, a silent Finno-Ugric, or a silent Nordic? A comparative study of Estonian, Finnish, and Swedish mother-adolescent interactions. *Applied Psycholinguistics*, 24(2), 249–265. <https://doi.org/10.1017/S0142716403000146>
- Vasalampi, K., Muotka, J., Pöysä, S., Lerkkanen, M.-K., Poikkeus, A.-M., & Nurmi, J.-E. (2016). Assessment of students' situation-specific classroom engagement by an InSitu Instrument. *Learning and Individual Differences*, 52, 46–52. <https://doi.org/10.1016/j.lindif.2016.10.009>
- Virtanen, T. E., Pakarinen, E., Lerkkanen, M.-K., Poikkeus, A.-M., Siekkinen, M., & Nurmi, J.-E. (2018). A validation study of classroom assessment scoring system–secondary in the Finnish school context. *The Journal of Early Adolescence*, 38(6), 849–880. <https://doi.org/10.1177/0272431617699944>
- Weissberg, R. P., Durlak, J. A., Domitrovich, C. E., & Gullotta, T. P. (2015). Social and emotional learning: Past, present, and future. In J. A. Durlak, C. E. Domitrovich, R. P. Weissberg, & T. P. Gullotta (Eds.), *Handbook of social and emotional learning: Research and practice* (pp. 3–19). The Guilford Press.
- Witt, P. L., Schrod, P., & Turman, P. D. (2010). Instructor immediacy: Creating connections conducive to classroom learning. In D. L. Fassett & J. T. Warren (Eds.), *The sage handbook of communication and instruction* (pp. 201–220). Sage.
- Zhang, Q., & Dewitt, P. L. (2016). Instructor immediacy. In P. L. Witt (Ed.), *Communication and learning* (pp. 157–182). Walter De Gruyter Inc.
- Zhang, Q., Oetzel, J. G., Gao, X., Wilcox, R. G., & Takai, J. (2007). Teacher immediacy scales: Testing for validity across cultures. *Communication Education*, 56(2), 228–248. <https://doi.org/10.1080/03634520601089092>