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## ORIGINAL ARTICLE

# Construction and validation of the cognitive attitudes toward inclusive education scale among teachers and paraprofessionals in the French context

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**Abstract**

Recent years have seen a growing shift toward global inclusive policies. Previous research highlighted the development of inclusive education, which notably requires collaboration among multiple actors (i.e., teachers, paraprofessionals, families). Among the barriers and levers to this implementation, attitudes toward inclusive education have been the subject of particular scholarly inquiry. This article reports two studies conducted to develop a French-speaking scale to address the emerging challenges in inclusive education by virtue of its suitability for a variety of actors. The 12 items of the Cognitive Attitudes Toward Inclusive Education Scale (CATIES) were derived from nine pre-existing scales. Two studies ( $N=180$  and  $N=228$ ) involving teachers and paraprofessionals (e.g. psychologists, special educators, nurses, and other paraprofessionals working in medical-educational facilities) were conducted within the French context to establish the scale's psychometric properties, such as internal consistency and convergent validity. Results reveal a reliable and valid tool with a three-dimensional structure measuring teachers' attitudes toward teaching students with special educational needs, benefits and risks of inclusive education on students with and without special educational needs and classroom management. In light of its relevance to a variety of inclusion stakeholders, this scale offers perspectives for more reliable inclusive education research.

**KEYWORDS**

attitudes, factor analyses, inclusive education, scale, special educational needs

**Key points**

- The Cognitive Attitudes Toward Inclusive Education Scale (CATIES) is a valid and reliable tool with a robust three-dimensional factor structure.
- The CATIES measures the cognitive dimension of attitudes, which is the most predictive of behaviour.
- The CATIES is the only French-speaking scale to jointly measure the attitudes of teachers and paraprofessionals, who are increasingly collaborating in the classroom.

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## INTRODUCTION

Implementing inclusive education for students with special educational needs (SEN) remains a significant challenge for the French educational and political systems. Inclusive education policies aim to fully involve each student in the classroom by addressing the needs of all students and providing necessary support (Bélanger et al., 2006; Curchod-Ruedi et al., 2013). The concept of SEN aligns with a broadly backed, more ecological approach to considering students' needs (Doré et al., 1996). Students with SEN are learners who, for a wide variety of reasons, require additional support and adaptive pedagogical methods in order to participate and meet learning objectives in an education program (UNESCO, 2012). This category includes a broad range of students such as student with various disabilities (e.g. autism spectrum disorders, physical impairment), students with high intellectual potential, students with learning difficulties or even orphaned students (see Clerc et al., 2023).

In France<sup>1</sup>, the number of students with SEN attending mainstream schools has increased over recent decades. If no official figure is available due to a lack of formal statistics, we know that, for example, in 2022, 436,085 students with disability were enrolled in mainstream education (222,547 in elementary school, 213,538 in middle and high school), reflecting an increase of 225% for this population since the beginning of inclusive education in 2005. If these students represent 3.6% of the French pupil's population, it is highly likely that students with SEN represent nonetheless 10%–15% of the whole students' population. This increase has a major impact on class composition and poses numerous challenges for French teachers in terms of resources, workload or difficulties (Jury et al., 2023). It is therefore essential to understand the obstacles to its implementation in this specific context.

Developing inclusive education is also important because it has significant implications at multiple levels, including improved learning of students with SEN (Sermier Dessemontet et al., 2011), to their well-being (Ruijs & Peetsma, 2009), and that of their parents (Cappe, 2012). Inclusive education also aims to improve learning for students without SEN (Szumski et al., 2017) and reduce prejudice (Ruijs & Peetsma, 2009).

The French government has implemented various measures to support inclusive education. Among them, we can mention the 25h on training on inclusive schooling for all teachers in initial training (Dintrich et al., 2022) or the creation in 2019 of the Localized Inclusive Support Hubs (PIAL in French) to coordinate the human and material resources needed for inclusive education. Despite proactive policy and legislation promoting inclusive education, implementation challenges appear to persist (Fortier et al., 2018)<sup>1</sup>. More precisely, French teachers express concerns regarding the lack of financial and material resources to include students with

SEN, the growth in their workload, the drop in the quality of teaching, and the difficulties of classroom management (Jury et al., 2023). These difficulties are also partly linked to inadequate trainings (Campion & Debré, 2012; Jury, Cèbe, et al., 2024), teachers' lack of confidence in their abilities (Savournin et al., 2020) or teachers' attitudes toward inclusive education (Desombre et al., 2019).

Teachers' attitudes toward inclusion (ATI) play a crucial role in the success of inclusive education (Avramidis & Norwich, 2002; de Boer et al., 2011) and have been widely studied (Lindner et al., 2023; MacFarlane & Woolfson, 2013). In order to contribute to this research area from French-speaking countries (and address the lack of tools for French-speaking researchers), the present paper aimed to develop and gather evidence of validity of a scale for assessing the ATI of different actors involved in inclusive education.

### Attitudes toward inclusive education

The concept of attitude was originally defined as state of mental and biological preparation for action resulting from experience (Allport, 1935). Eagly and Chaiken (1993) described attitudes as favourable or unfavourable psychological evaluations toward an object, behaviour or aspect of the world (see also Ajzen, 1991). According to Rosenberg et al. (1960), three complementary dimensions define attitudes: cognitive, affective and conative. Specifically, attitudes toward inclusive education refer to individuals' opinions, beliefs and thoughts about including students with SEN (cognitive dimension), their feelings when inclusive education is mentioned (affective dimension), and their behavioural intentions toward it (conative dimension). These three components of this model are positioned at the same level and serve as predictors of individuals' behavioural intentions. In the context of inclusive education, the intention to develop more inclusive pedagogical practices can depend on one's beliefs (cognitive) about it, one's feelings (affective) toward it, and one's belief in terms of the tendency to act (conative). Attitudes influence teachers' willingness to work with students with various disorders (Hind et al., 2019; MacFarlane & Woolfson, 2013). Some studies have shown that teachers' attitudes toward inclusive education range from neutral to positive (Saloviita, 2022), with a tendency to improve over time (Van Steen & Wilson, 2020). These attitudes are influenced by context-related factors (e.g. space configuration, Gilles, 2013), student-related factors (e.g. the type of difficulty, Jury et al., 2021), and teacher-related factors (e.g. beliefs in meritocracy, Khamzina et al., 2021). Some studies have also demonstrated self-efficacy to play an important role in attitudes toward inclusive education (Desombre et al., 2019; Lautenbach & Heyder, 2019). For example, Desombre and her

colleagues investigated the hypothesis that the observed disparity in attitudes toward inclusive education among general and special education teachers in France may be attributable to their respective levels of efficacy. They confirmed their prediction: general teachers have less positive attitude toward inclusive education than special education teachers partly because they feel less confident on their capacities. In other words, self-efficacy influence attitudes toward inclusive education.

### The measure of teachers' attitude toward inclusive education

Numerous studies have previously aimed to develop standardized tools for measuring teachers' attitudes toward inclusive education (e.g. Sentiments, Attitudes, and Concerns about Inclusive Education Revised Scale, SACIE-R, Forlin et al., 2011; Impact of Inclusion Questionnaire, IIQ, Hastings & Oakford, 2003). The attitude measures used in these studies vary depending on the dimension evaluated. While some scales are multi-dimensional (Teacher Questionnaire, TQ, de Boer et al., 2012; Multi-dimensional Attitudes toward Inclusive Education Scale, MATIES, Mahat, 2008; Concerns about Inclusive Education, CIE, Sharma & Desai, 2002), a large majority focus on the cognitive dimension of attitudes toward inclusive education (Opinions Relative to Integration of Students with Disabilities, ORI; Antonak & Larrivee, 1995, the Principal's Attitudes Toward Inclusive Education, PATIE; Bailey, 2004, or the Attitudes Toward Inclusive Education Scale, ATIES; Wilczenski, 1995). Those previously developed scales highlight various other themes such as workload (Bailey, 2004; Sharma & Desai, 2002), classroom management (Antonak & Larrivee, 1995), and different aspects of social, physical, academic and behavioural inclusion (Wilczenski, 1995).

Some of these tools are specifically designed for teachers (Teacher's Attitudes toward Inclusion Scale, TAIS, Monsen et al., 2015) or parents (My Thinking About Inclusion Scale, MTAIS, Stoiber et al., 1998). In response to the new collaborative perspectives, only a few authors have adapted tools originally designed with parents in mind for use among teachers (e.g. PATI, Palmer et al., 1998; Teacher Attitudes Toward Inclusion, TATI, Stanley et al., 2003). Although these adaptations acknowledge the need to investigate attitudes at different levels, the questionnaires remain distinct for teacher and parent respondents and do not appear to be suitable for other stakeholders. However, recent research highlights the importance of considering all stakeholders in inclusive education, such as social and medical workers (Baron et al., 2019; Brasselet et al., 2022). It is crucial that inclusive education be viewed from an interprofessional perspective (i.e. the collaboration of professionals from various disciplines,

D'amour & Oandasan, 2005) which includes paraprofessionals from the medical-social sectors (e.g. doctors, psychologists, speech therapists, occupational therapists, nurses, special educators) and members of the educational system (Hedegaard-Soerensen et al., 2018). Furthermore, paraprofessionals have a role to play in shaping attitudes. They contribute to create an environment that support the schooling students with SEN. Indeed, these professionals provide paramedical services to create a learning environment that supports the full participation of students with SEN in the mainstream educational setting (Hemmingsson et al., 2007; Suc et al., 2017).

### French-speaking scales measuring ATI

For French-speaking researchers, excepted the translated Opinions Relative to Integration (ORI-F; Benoit, 2016), to our best knowledge, few tools measure attitudes toward inclusive education. Although ORI-F is a comprehensive instrument for measuring attitudes toward inclusive education, the translation was not fully satisfactory from a statistical standpoint revealing structural differences with the original scale (Benoit & Valls, 2018). The MATIES scale (Mahat, 2008) has also been translated and demonstrates satisfactory psychometric qualities (Massé et al., 2020). However, these tools do not address emerging need to study attitudes among professionals from different sectors, as they are solely adapted for teachers.

In other words, no existing scale addresses the need to measure attitudes among various stakeholders using a single, validated French-speaking instrument. Additionally, English-language scales do not assess attitudes among actors involved in educating students with SEN. We therefore aimed to develop and validate a new scale suitable for measuring attitudes among both teachers and other professionals, such as medical-social professionals. In line with Hastings and Oakford (2003), we regard attitudes as a cognitive disposition for judging and evaluating behaviour relative to our beliefs and knowledge. Consequently, our scale aims to focus exclusively on the cognitive dimension. This decision is also driven by the fact that this cognitive dimension appears distinct enough to warrant more careful and specific examination (see, for example, inconsistent correlations between this sub-dimension and others, de Boer et al., 2012). Moreover, Krischler and Pit-ten Cate (2019) illustrated that while the affective component of teachers' attitudes toward students with disability does not predict their judgement toward such students, the cognitive one does. Finally, we also noted that a significant majority of researchers working with this model consider attitudes primarily through their cognitive dimension when predicting behaviour (de Boer et al., 2011; Yan & Sin, 2013). Therefore, the

development of a French-speaking scale accommodated to a range of professionals involved in inclusive education, with enough cognitive items to assess it exhaustively was necessary to enable French-speaking researchers to effectively evaluate attitudes toward inclusive education and contribute to this research field. In addition, and in a broader context, such a tool would also be important to sustain the implementation of the inclusive education policy. Indeed, by more precisely identifying French teachers' and paraprofessionals' opinions, beliefs and thoughts about including students with SEN, it would allow to design and assess effective interventions in terms of training to improve their attitudes (see for example Vieira et al., 2024).

Two studies were designed to better achieve these objectives: the first for exploratory factor analysis, and the second for confirmatory factor analysis. These studies were preregistered ([https://osf.io/utdbm/?view\\_only=14842a85bade482a91cf5ff71fed3078](https://osf.io/utdbm/?view_only=14842a85bade482a91cf5ff71fed3078)) and the associated data and materials are fully accessible here: [https://osf.io/zvhjm/?view\\_only=dc69975e889948b8a77b1892f3e9fd8e](https://osf.io/zvhjm/?view_only=dc69975e889948b8a77b1892f3e9fd8e).

## STUDY 1

### Method

#### Sample

The sample consisted of 107 in-service and pre-service teachers (54 in-service teachers and three head of school, 28 pre-service teachers, 22 special teachers) and 73 paraprofessionals (i.e. 16 psychologists, 23 special educators, two nurses, one in-service special educator, two speech therapists, seven psychomotor therapists, one doctor, five occupational therapists, two social assistants and 14 other paraprofessionals who did not want to indicate their profession<sup>2</sup>). The decision to include pre-service teachers is due to the fact that in France, they are responsible for a class for half the year as part of their training curriculum. In addition, this tool could be used for them as it could for head of school.

This sample included 141 women<sup>3</sup> and 33 men, and 6 participants chose not to provide this information. In France, there are disparities in career paths, particularly evident in the education sector where women are overrepresented (Moreau, 2015). The mean age was 36.2 years (SD=11.5), and respondents had an average of 11 years of professional experience (SD=11.2). Five participants did not provide their age, and eight did not indicate their years of professional experience. We have excluded two teachers in higher education since the inclusive education paradigm is very distinct for this population (i.e. students with SEN in higher education are very distinct in comparison with those in

primary and secondary education). We also excluded seven paraprofessionals in non-medical-educational institutions since they do not interact with students in the context of schooling.

### Procedure

The participants were recruited primarily through emails sent to academic executives, mainly from the Hauts-de-France region, as well as to institutions within the same area. This region is notable for its higher concentration of medical-educational facilities. The study was also disseminated via social and professional networks. Questionnaires were administered online using the Lime Survey Platform, with scale items presented in random order. Participants were volunteers and were asked to respond individually and anonymously. Information and a letter of consent were presented on the first page, followed by a short definition of SEN pupils and inclusive education. Approval from the university ethics committee was obtained (DEEAE 2022-009).

### Material

#### *Cognitive attitudes toward inclusive education scale*

Three distinct work sessions, involving five researchers specializing in inclusive education, were organized to propose a new scale. First, based on the review by Ewing et al. (2018), the psychometric properties of nine pre-existing English-language scales (see Appendix S1) measuring attitudes toward inclusive education (i.e. ORI, Antonak & Larrivee, 1995; PATIE, Bailey, 2004; TQ, de Boer et al., 2012; SACIE-R, Forlin et al., 2011; IIQ, Hastings & Oakford, 2003; MATIES, Mahat, 2008; TAIS, Monsen et al., 2015; CIE; Sharma & Desai, 2002; ATIES, Wilczenski, 1995) were examined for suitability. Second, all items assessing the cognitive dimension of attitudes (158 items) were extracted from these scales. After sorting these items into salient categories (12 categories: professional training, professional abilities, academic progression, time, parents, workload, resources and inadequacies, social and emotional development, SEN student's abilities, smooth running of the class and general ATI), the number of items was reduced through an analysis of redundancy and opposition (e.g. 'The extra attention students with disabilities require will be to the detriment of the other students' was put in the same category as 'Inclusion does not prevent me from giving attention to the other children in the class' since they are opposed but assess the same object). However, the number remained too large (65 items). A priority was then granted to items exhibiting frequent occurrences in the existing literature (criteria set for item selection comprised those appearing in a minimum of three out of the nine scales).

Finally, this process led to the creation of 19 items (including nine reverse-scored items) inspired by the previous selected items. These items were adjusted for completion by a broad spectrum of professionals (teachers and paraprofessionals) and translated into French. To assess the cognitive dimension of attitudes, all items were adjusted to begin with ‘I believe,’ except for item 14, which starts with ‘I do not support.’ We chose to keep the syntax of this item to preserve its meaning. The response format consists of a five-point Likert agreement scale ranging from completely disagree to completely agree. It should be noted that these items were reread by 13 teachers of different levels prior to the study to ensure that they were correctly understood<sup>4</sup>.

### *Socio-demographic information*

Participants were asked to optionally fill in socio-demographic information such as age, gender, region, teaching experience (in years), experience with students with SEN (yes or no) and teaching level, where relevant.

## Results

### Initial item and exploratory factorial analysis

An Exploratory Factor Analysis (EFA) was carried out on the 19 items, with prerequisites for the factorial analyses being verified. The Kaiser-Meyer-Olkin index proved satisfactory ( $KMO=0.90$ ), while Bartlett's test of sphericity was significant,  $\chi^2(171)=1532.48, p<0.001$ . Correlation analyses were then conducted to verify inter-item correlations, revealing that all 19 items had strong correlations with the total item mean, ranging from  $r=0.35, p<0.001$  to  $r=0.66, p<0.001$ . Responses to item 14 (i.e. different syntax) were consistent with responses to the other items (from  $r=0.22, p<0.01$  to  $r=0.56, p<0.001$ ).

Based on the recommendations from multiple authors (Howard, 2016; Kılıç, 2020; Matsunaga, 2010; Watkins, 2018), we use several indicators to estimate the numbers of factors to retain. Two of them (i.e. Parallel Analysis and scree plot) suggest three factors (see on osf files), one (Minimum Average Partial analysis) suggests two. Therefore, a first EFA with an expectation of three factors with a Principal Axis estimation method and an oblimin rotation was conducted (since factors are expected to correlate). This structure explains 47% of the variance ( $F1=24\%$ ,  $F2=18\%$ ,  $F3=5\%$ ). However, based on the rule proposed by Howard (2016), indicating that satisfactory variables should load onto their primary factor above 0.40, load onto alternative factors below 0.30, and demonstrate a difference of 0.20 between their primary and alternative factor loadings, multiple items (i.e. items, 1, 2, 7, 8, 12, 13) appear to cross load suggesting

removing them. To explore the factor structure of the scale after the deletion of these items, a new EFA was performed on the same sample with the remaining 13 items.

### Second EFA (13 items)

The objective of this analysis was not to confirm the structure identified in the first analysis, but to explore the new structure arising from the analysis of the selected 13 items. Preconditions for the factorial analysis were verified, revealing the adequacy of the structure:  $KMO=0.89; \chi^2(78)=883.30, p<0.001$ .

The 13 items were split across three factors. The first factor included with four items (items 3, 14, 16, 19), explaining 19% of the total variance and 38% of the common variance. This factor encompassed items measuring attitudes toward the impact of inclusive education on teaching (e.g. ‘I do not support the enrollment of SEN students in regular classes, as it overloads teachers with an already heavy workload’). As indicated in Table 1, factor weights for items in this teaching factor ranged from 0.65 (Item 3) to 0.78 (Item 16). A second factor was identified, accounting for 17% of the total variance and 34% of the common variance. This factor included items (items 5, 6, 11, 17, 18) measuring attitudes toward the effects of inclusive education on students (with or without SEN, e.g. ‘I believe that enrolling SEN students in regular classrooms improves their independence’). Items had factor weights ranging from 0.45 (Item 18) to 0.86 (Item 5). Finally, a third factor including 3 items (items 4, 9, 10), accounting for 14% of the total variance and 28% of the common variance. These items measure attitudes toward the consequence of inclusive education in terms of classroom management (e.g. ‘I believe that having SEN students in the regular classroom does not make classroom management more difficult’) with factor weights ranging from 0.70 to 0.73. It should be noted that item 15 does not load on any factor (it highest load is on the first one at a value of 0.31) suggesting a 12-item scale instead of the 13-item tested here. Additionally, the teaching and the classroom management factors strongly correlate ( $r=0.69, p<0.001$ ) suggesting that a two-factor solution would have been relevant as well. Confirmatory Factor Analyses in the second study would help to find the best solution.

### Reliability of the CATIES

To assess the internal consistency of the Cognitive attitudes toward inclusive education scale (CATIES), McDonald's omega was employed (Flora, 2020). Results indicate satisfactory reliability indices for the teaching ( $\omega=0.82$ ), students ( $\omega=0.82$ ) and the classroom management ( $\omega=0.78$ ) factors specifically. Moreover, the whole

**TABLE 1** Factor loadings (EFA–13 items).

	Factors			Uniqueness
	1	2	3	
16. I believe that educating students at SEN requires too many changes in the organization of the classroom and teaching approaches	0.78			0.54
14. I do not support the enrollment of SEN students in regular classes, as it overloads teachers with an already heavy workload	0.70			0.52
19. I believe that putting SEN students in regular classes is a good idea in theory, but in practice it is not possible to implement it	0.66			0.51
3. I believe that the presence of SEN students in the regular classroom takes the attention of the teachers away from the other students	0.65			0.56
5. I believe that the presence of SEN students in schools facilitates the acceptance of difference by other students		0.86		0.69
6. I believe that the presence of SEN students in schools improves the social behaviour of all students.		0.71		0.53
11. I believe that SEN students should have the right to learn in a regular classroom		0.49		0.50
17. I believe that the enrolment of SEN students in regular classes has beneficial effects on the social–emotional development of SEN students		0.49		0.41
18. I believe that enrolling SEN students in regular classrooms improves their independence		0.45		0.39
9. I believe that having SEN students in the regular classroom does not make classroom management more difficult			0.73	0.53
10. I believe that the presence of SEN students creates too much disruption in the classroom			0.72	0.58
4. I believe that the presence of SEN students in the regular classroom does not hinder the smooth running of the class			0.70	0.56
15. I believe that regular teachers are as relevant as special education teachers for the education of students with SEN				0.14

12-item scale demonstrated a satisfactory level of internal consistency ( $\omega=0.88$ ).

## Discussion

The aim of this first study was to test the psychometric qualities of the CATIES and to analyse its factorial structure. An initial EFA conducted on the 19 selected items indicated that 6 items cross loaded, leading to the decision of removing them and retain the 13 remaining items for a second exploratory factor analysis. This one suggested a three-dimensional factorial structure. Upon further analysis of the items, the results suggested the presence of three factors measuring teachers' attitudes regarding the impact of inclusive education on teaching (Factor 1), students (Factor 2), and classroom management (Factor 3). This model could be coherent in the confirmatory factor analysis. The reliability analyses of the scale were satisfactory, and the items demonstrate good correlations with one another. These factors are relevant with some English-speaking scales (i.e. the benefits of inclusion from the ORI scale). It should however be noted that there is a need to test this factor structure using confirmatory factor analyses (Thompson & Borrello, 1992).

Additionally, we aimed to assess the convergent validity of our scale by measuring teachers' self-efficacy. Indeed, previous literature has shown strong correlations between self-efficacy and attitudes toward inclusive education (Desombre et al., 2019; Wilson et al., 2016).

## STUDY 2

### Method

#### Sample

The sample<sup>5</sup> comprised 158 teachers (i.e. 127 in-service teachers, 29 specialized teachers, and two pre-service teachers) and 70 professionals from the medical-social sectors (i.e. 10 psychomotricians, 14 psychologists, 18 specialized educators, two speech therapists, two social assistants, four nurses, one occupational therapist and 19 other paraprofessionals). It included 160 women, 42 men, and 26 participants who did not wish to provide this information. The mean age was 42.8 years (SD=10.5), and the mean professional experience was 16.5 years (SD=10.9). Nineteen participants did not provide their age, and 21 did not indicate their years of professional

experience. The recruitment method is unchanged from study 1 (emails sent to academic executives and through social and professional networks).

## Procedure

The second study followed the same procedure as in the first one (preregistration of the study, ethical agreement, use of mailing list and anonymization, the material available on OSF: [https://osf.io/zvhjm/?view\\_only=dc69975e889948b8a77b1892f3e9fd8e](https://osf.io/zvhjm/?view_only=dc69975e889948b8a77b1892f3e9fd8e)). The experiment's duration was nevertheless slightly longer due to the addition of a scale.

## Measures

### CATIES

Participants were asked to respond to a five-point Likert scale ranging from completely disagree to completely agree on the items.

### Teacher efficacy

To study the convergent validity of our tool, teachers from our sample also completed the Teacher's Efficacy Scale (TES, developed by Gibson & Dembo, 1984). This scale comprises 16 statements where teachers rate their agreement on a Likert scale ranging from 1 (Strongly Disagree) to 6 (Strongly Agree). Translated by Dussault et al. (2002) using Vallerand's method (1989), the scale demonstrated good internal consistency with a Cronbach's alpha of 0.71 and others metrological good properties with 2 dimensions: general efficacy and self-efficacy. This tool was validated with a sample of 314 students. In the present study, the internal consistency index for the 129 teachers who completed the scale among our sample was found to be acceptable ( $\omega = .83$ ).

### Socio-demographic information

As in Study 1, participants were asked to complete an optional socio-demographic questionnaire. The requested information was the same: age, gender, region, years of experience, experience with students with SEN (yes or no), and grade level of the students under their responsibility.

## Results

### Statistical analysis

A Confirmatory Factor Analysis using the robust maximum likelihood method was conducted on the 12-item scale identified in Study 1 with a three-factor solution (see Table 2). This extraction method was chosen because variables measuring teachers' attitudes toward inclusive education often slightly or moderately deviate from normality (notably due to social desirability, Lüke & Grosche, 2018). Following recommendations from the field (see for examples, Bentler, 1990), expected cut-off values were set  $>0.95$  for CFI and TLI,  $<0.06$  for RMSEA, and  $<0.04$  for SMRM.

### Confirmatory factorial analyses

The chi-square fit index was large and significant, ( $\chi^2(51)=114.63$ ,  $p<0.001$ ), indicating a suboptimal adjustment. However, this index is sensitive to the sample size and the ratio of chi-square to the number of degrees of freedom ( $\chi^2/df$ ), allowing for partial correction, was  $<3$  (Hayduk, 1987). Fit indices, in line with the section above, appear to be moderately satisfactory (CFI=0.945; TLI=0.929; AGFI=0.857; RMSEA=0.076; SRMR=0.046). However, these indices could be improved when allowing error terms from items 17 and 18, but also those from items 5 and 6 to correlate (based on modification indices, 21.37 and 14.66 respectively and due to semantic proximity of the items) to reach a satisfactory level (CFI=0.968; TLI=0.958; AGFI=0.887; RMSEA=0.059; SRMR=0.039).

To be sure that the three-factor model was the most adjusted to our data, this one was compared to three distinct models. More precisely, the first one (i.e. 'Three-factor model A' in Table 2 below) was a one-factor structured model (i.e. 'Undiff. model'). The second one was a two-factor solution (i.e. 'Two-factor model') considering the teaching and the classroom management factors as one (due to the high correlation obtained between these factors in study 1,  $r=0.69$ ,  $p<0.001$ ). The third one (i.e. 'Three-factor model B') was the replication of the three-factor solution but including item 15 in the teaching factor (this item was

**TABLE 2** Comparison of the hypothesized and alternative models.

Model	$\chi^2(N=228)$	Df	$\chi^2/df$	CFI	TLI	AGFI	RMSEA	SRMR	$\Delta\chi^2$	AIC	BIC
Three-factor model A	87.24	49	1.78	0.968	0.958	0.887	0.059	0.039		6624.33	6764.93
Undiff. Model	137.78	52	2.64	0.925	0.905	0.821	0.085	0.058	36.27***	6675.88	6806.19
Two-factor model	99.93	51	1.96	0.959	0.947	0.874	0.066	0.042	11.26**	6634.52	6768.27
Three-factor model B	108.67	60	1.81	0.961	0.949	0.875	0.060	0.042	21.36*	7249.96	7400.85

Abbreviations: AIC, akaike information criterion; BIC, Bayesian information criterion; CFI, comparative fit index; TLI, Tucker–Lewis error of approximation; Undiff., undifferentiated.

\* $p<0.05$ . \*\* $p<0.01$ . \*\*\* $p<0.001$ .



initially retained from the first EFA but only load at a value of 0.31 in the second EFA of Study 1 that lead us to finally remove it). If these models had quite acceptable to good fit indices (i.e.,  $0.925 < CFI < 0.961$ ;  $0.905 < TLI < 0.949$ ;  $0.060 < RMSEA < 0.088$ ;  $0.042 < SRMR < 0.058$ ), specific comparisons reveal that the three-factor model involving the 12 items was better adjusted than the one-factor model,  $\Delta\chi^2 = 36.27$ ,  $p < 0.001$ , the two-factor model,  $\Delta\chi^2 = 11.26$ ,  $p = 0.004$ , and the three-factor model B,  $\Delta\chi^2 = 21.36$ ,  $p = 0.03$  (see Table 2 for full details)<sup>6</sup>.

## Reliability of the CATIES

Internal consistency for the CATIES was assessed using McDonald's omega, as in Study 1. The reliability indices for the teaching ( $\omega = 0.82$ ), the students ( $\omega = 0.82$ ) and the classroom management ( $\omega = 0.74$ ) factors were satisfactory. In addition, the whole 12-item scale demonstrated acceptable internal consistency ( $\omega = 0.90$ ).

## Convergent validity

Correlation analyses were performed between the CATIES and TES responses (for teachers in our sample only). Significant positive correlations were found between teachers' self-efficacy and the teaching factor ( $r = 0.477$ ,  $p < 0.001$ ), the students factor ( $r = 0.422$ ,  $p < 0.001$ ), and the classroom management factor ( $r = 0.339$ ,  $p < 0.001$ ). In other words, the more teachers feel competent, the more positive they are regarding inclusive education (confirming previous results from the literature, Yada et al. 2022).

## Secondary results

Additional analyses were conducted to examine participants attitudes and differences between two groups: teachers and paraprofessionals. More precisely, a repeated measure ANOVA was conducted with the CATIES dimension as a within factor at three levels (i.e. attitudes toward the effect on teaching, attitudes toward the effect on students and attitudes toward the effect on classroom management) and the workplace of participants (Mainstream education vs. medico-social) as a between-factor. Results revealed a main effect of the CATIES dimension,  $F(2, 452) = 127.78$ ,  $p < 0.001$ ,  $\eta^2_p = 0.36$ . More precisely, participants had more positive attitudes toward inclusive education when they think about the effect on students ( $M = 3.86$ ,  $SE = 0.05$ ) in comparison with the effect on classroom management ( $M = 3.29$ ,  $SE = 0.06$ ) or teaching ( $M = 3.10$ ,  $SE = 0.06$ , all  $p_{\text{Bonferroni}} < 0.001$ ). Additionally, paraprofessionals' overall attitudes ( $M = 3.54$ ,  $SE = 0.09$ ) were better than those

of teachers ( $M = 3.29$ ,  $SE = 0.06$ ),  $F(1, 226) = 5.79$ ,  $p < 0.017$ ,  $\eta^2_p = 0.03$ . Nonetheless, it seems that this difference depended on the CATIES dimension,  $F(2, 452) = 10.83$ ,  $p < 0.001$ ,  $\eta^2_p = 0.04$ , since the abovementioned superiority of paraprofessionals only appeared on the teaching factor ( $M_{\text{Para}} = 3.35$ ,  $SE_{\text{Para}} = 0.11$ ;  $M_{\text{Teach}} = 2.85$ ,  $SE_{\text{Teach}} = 0.07$ ;  $p_{\text{Bonferroni}} = 0.002$ ; all other comparisons were not significant).

## Discussion

This second study confirming the factorial structure was critical to validating the CATIES. The results indicated that this 12-item version (see Appendix S1), with three dimensions, demonstrated satisfactory psychometric indices such as adjustment and internal consistency. These findings were further supported by testing three distinct models, which revealed unsatisfactory fit indices. Consequently, the confirmatory factor analyses underscored the significance of considering the scale as three-dimensional. Other indicators of goodness of fit were mostly satisfying. Overall, the results of the model fit were acceptable, but there is room for improvement.

Secondary, results revealed that teachers who displayed favourable attitudes toward inclusive education also exhibited a greater sense of efficacy. This demonstrates the strong convergent validity of the CATIES, as the connection between attitudes and self-efficacy has been consistently highlighted in the literature (Desombre et al., 2019), and it supports these previous theoretical findings.

For all participants, attitudes were more positive when discussing the consequences of inclusive education on students' academic and social skills than on teaching and classroom management. This could be related to concerns about workload and managing an inclusive classroom (e.g. for teachers, Lindner et al., 2023). Some differences emerge between paraprofessionals and teachers regarding their attitudes toward inclusive education, highlighting variations in their perspectives and the factors influencing their views on the inclusion of students with SEN into mainstream classrooms. Indeed, regarding the consequences of inclusion on the 'teaching' factor, paraprofessionals had more positive attitudes than teachers.

## GENERAL DISCUSSION

The primary aim of the current studies was to develop and validate a scale tailored for French-speaking researchers to assess attitudes toward inclusive education among a diverse range of professionals. Although numerous English-speaking scales are available, their terminology does not align with our research focus (i.e. offering the chance to compare attitudes from multiple

actors involved in inclusive education) or the way the inclusive paradigm is organized in French-speaking countries (like France for example).

The factorial results merit further exploration. Indeed, compared to previously developed scales, the factorial structure of the CATIES is distinct, featuring only three dimensions. Among scales measuring the cognitive attitudinal dimension, the ORI (Antonak & Larrivee, 1995) encompasses four dimensions, as do the ATIES (Wilzenski, 1995) and the TAIS (Monsen et al., 2015), while the PATIE (Bailey, 2004) comprises five dimensions. Even though the CATIES' items were derived from these earlier instruments, their factor structure seems more general. These dimensions parallel other multi-dimensional scales, such as the IIQ (Hastings & Oakford, 2003), which considers, among other factors, the classroom environment and the impact of inclusive education on both students with and without SEN. Similarly, the ORI (Antonak & Larrivee, 1995) assesses attitudes related to classroom management and teaching, among other elements.

The CATIES exhibits suitable properties, making it a valuable instrument for measuring professionals' attitudes toward inclusive education. The scale demonstrates significant inter-item correlations, indicating strong internal consistency. By focusing exclusively on the cognitive attitudinal dimension, our tool achieves better internal consistency indices compared to many existing English-language multidimensional scales (e.g. IIQ,  $\alpha=0.81$ ; SACIE-R,  $\alpha=0.75$ ). With fewer items than other scales (e.g. ORI, 25 items; TAIS, 30 items; IIQ, 23 items), the CATIES also boasts a shorter completion time.

Furthermore, the CATIES displays acceptable construct validity, as measured by its convergence with teachers' self-efficacy. Such a level of validity has not always been found in the literature (e.g. TQ; de Boer et al., 2012). During the analyses, significant positive correlations between self-efficacy and attitudes were observed, thus providing evidence of the scale's convergent criterion validity. This result aligns with previous findings emphasizing the connection between teachers' attitudes and their sense of efficacy (Desombre et al., 2019; Wilson et al., 2016). It should be noted that the measures were not counterbalanced in the present study and that we cannot exclude an order effect. However, since no causal inference has been made regarding the link between teaching efficacy and attitudes here, such a choice has limited implication.

In addition, and although no hypotheses were formulated, the present research indicates that different backgrounds and professions are associated with differences in attitudes toward inclusive education. More precisely, paraprofessionals held more positive attitudes toward inclusive education than teachers, particularly in the teaching sub-dimension. The fact that teachers have more negative attitudes regarding teaching is in

line with other studies that have highlighted teachers' concerns about the classroom environment and lack of time (Odongo & Davidson, 2016). This finding raises questions about the differences between these two core actors, notably in terms of perception of inclusive education. Indeed, the fact that paraprofessionals express more positive attitudes regarding this dimension may translate the fact that they do not know well the expectations and the working conditions associated with the teaching profession. In France, paraprofessionals typically work in structured environments with smaller class sizes and greater material resources compared to teachers. However, it might also be due to their initial training, which is more focused on educating or working with students with SEN, compared to teachers, whose training primarily focuses on pedagogy, didactics and subject matter expertise for a larger group of students. Future studies could be conducted to specifically understand the differences between these professionals.

It should be noted that the sub-dimensions of our scale open other avenues for research regarding the attitudes of other inclusive education actors, such as parents. Indeed, parents of students without SEN in inclusive classrooms report explicit concerns similar to the latent factors of the CATIES. More precisely, Peck et al. (2004) highlight parents' concerns about classroom management and disruptions. Additionally, this study shows that parents are aware of the benefits and risks of inclusion concerning social and academic skills. If the concerns raised by parents align with those of teachers and paraprofessionals, it would be valuable to compare them in future research. The tool developed in this research could address this need, as its items are at once general and tailored to all of these inclusive education stakeholders.

More broadly, the concept of creating an inclusive community has gained traction in recent years (Finkelstein et al., 2018). Collaboration between teachers, parents and other professionals is crucial to ensuring the successful implementation of inclusive education (Bennett et al., 1997). It seems that the development and validation of the CATIES could answer to this emerging need by being adaptable for teachers, parents and professionals from various sectors, including the medical-social sectors. The CATIES could thus serve as an additional indicator of the state of inclusive education in France.

If this tool could help assess whether differences exist between the attitudes of a variety of inclusive education stakeholders (i.e. teachers, parents, paraprofessionals) it could also help to evaluate the implications for the success of inclusive education (e.g. in relation to inclusive teaching practices). Some theories have explored the impact of attitudes on behaviour (Theory of Reasoned Action, Ajzen & Fishbein, 1980, Theory of Planned Behaviour, Ajzen, 1991). Future research involving the CATIES should focus on the impact of stakeholders' attitudes on the effective implementation of inclusive education (e.g. in terms of inclusive practices).

However, some limitations should be considered. First, the fit seems to be partially challenged by the significant  $\chi^2$  chi-square index, although the other adjustment indices were satisfactory. Secondly, we did not test the measurement invariance of the factor structure among the two groups of participants. It would have required a larger sample size, which was not feasible in this study. Third, since the scale has been validated in France, this one is maybe not suitable for other French-speaking countries. Although all French-speaking countries and provinces (e.g. Quebec, Cameroon, Switzerland Canada, Belgium and France) have implemented pro-inclusive education policies, institutional, legislative, cultural and economic differences exist resulting in distinct implementation of the paradigm. The present scale should therefore be validated in other French-speaking contexts. Fourth, participant selection may also constitute a bias. Indeed, the participants in this study are volunteers, so they may be particularly interested in this topic. They are therefore not representative of the entire teaching community. Fifth, our scale intentionally does not differentiate inclusion based on students' difficulties or needs. Previous research has indicated that attitudes toward inclusive education vary depending on students' needs (Avramidis & Norwich, 2002; Cumming, 2012; Jury et al., 2021). To better understand the reluctance of some professionals, adapting this scale to obtain different scores for each special need (Kudláček et al., 2002), as done in the ATIES (Wilczenski, 1995), could be insightful. Sixth and finally, given that a scale should be continuously tested across studies, it would be relevant to assess the criterion and the predictive validity of the tool to demonstrate its pragmatic usefulness. Future research should continue to systematically test the stability of the factor structure presented in this paper.

## CONCLUSION

The present research aims to provide additional indicators for the successful implementation of inclusive education. In terms of theoretical implications, these studies offer a reliable tool for future research on inclusive education. It is our hope that future research will facilitate cross-cultural validation of this scale, enabling its broader use. From a practical perspective, we anticipate that CATIES will contribute to a better understanding of professionals' beliefs, leading to the identification of barriers and levers to inclusion, and of their training needs. Indeed, on a practical level, this tool could, for instance, help pinpoint training needs and even assess the effectiveness of different interventions based on variables improving attitudes.

Evaluating professionals' opinions on inclusive education is an essential first step in gaining insight into

their perspectives and promoting a positive shift in perception.

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## CONFLICT OF INTEREST STATEMENT

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

## DATA AVAILABILITY STATEMENT

The associated data and materials are fully accessible here: [https://osf.io/zvhjm/?view\\_only=dc69975e889948b8a77b1892f3e9fd8e](https://osf.io/zvhjm/?view_only=dc69975e889948b8a77b1892f3e9fd8e).

## ETHICS STATEMENT

Approval from the university ethics committee of Lille was obtained (DEEAE 2022–009). APA ethical guidelines were followed in the conduct of the study.

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## ENDNOTES

<sup>1</sup> Database from French Ministry of National Education. See Ministère de l'Éducation nationale et de la Jeunesse. (2024). L'Éducation nationale en chiffres, édition 2024. Direction de l'évaluation, de la prospective et de la performance (DEPP). <https://www.education.gouv.fr/reperes-et-references-statistiques-2024-414953>.

<sup>2</sup> They were staff in contact with the students, such as directors of para-professional establishments, workshop teachers, members of the management team or members of the intervention team.

<sup>3</sup> It should be noted that our samples include 74.07% of women, a number very close to 73.40% of women who worked for the French ministry of education (DEPP, 2023) or the 67.8% of women who worked as paraprofessionals (DRESS, 2022).

<sup>4</sup> This preliminary tool was first pre-tested with a small sample of teachers ( $n=13$ ) to confirm the understandability of the items. We distributed the scale to participants the scale and requested they send us their corrections if they identified errors or unclear items. Participants were prompted to indicate the extent to which they agree with each item from 1, strongly disagree to 5, strongly agree. No teachers in this pretest indicated any problems with understanding the scale.

<sup>5</sup> Although there is no absolute minimum number of participants required for conducting Confirmatory Factor Analysis (Gagné & Hancock, 2006), some authors suggest that a sample size of 150 to 200 participants is acceptable (Field, 2009; Tabachnick & Fidell, 2007). Based on these recommendations, we also determined the sample size for our Exploratory Factor Analysis (EFA).

<sup>6</sup> It should be noted that a replication of these analyses on a new sample involving 263 in-service teachers (Jury et al., 2024b) confirm the three-factor model as relevant. In this study, fit indices reach a satisfactory level (CFI=0.959; TLI=0.947; AGFI=0.880; RMSEA=0.063; SRMR=0.038).

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## SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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