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The conceptualisation of school and teacher connectedness in adolescent research: a scoping review of literature

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ABSTRACT

The aim of this scoping review was to map and summarise research relating to school and teacher connectedness, in order to increase current understanding of the ways these terms have been conceptualised in adolescent research. Specifically, this scoping review focuses on the analysis of the actual definitions used and the ways in which school connectedness and teacher connectedness are operationalised in existing measures. Using the terms *connectedness*, *teacher* and *school* as keywords, we searched SCOPUS, Web of Science, ERIC, the Cochrane Library and the EPPI Centre Database of Education Research for relevant peer-review articles published in English from 1990 to 2016. 350 papers were selected for the review. Many studies failed to provide a definition of school or teacher connectedness and there were some differences in the way these constructs were operationalised in the main measures. Future research should be thorough in the definition of these constructs, and ensure consistency between the definition used and the operationalisation of the connectedness construct in the selected measure. Unpacking the global concept of school connectedness and examining the role of its different components (global feelings towards school, teacher connectedness, relationships with classmates, etc.) separately may also contribute to building a more coherent body of evidence in this area. Reflecting on the place of school and teacher connectedness in the broader context of the literature on school climate and bridging distances between the research on school connectedness and that on related constructs is another necessary step to move this field forward.

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Teacher connectedness; school connectedness; adolescence

Introduction

Student–teacher relationships have protective and predictive effects on social, behavioural and academic outcomes from an early age (Ekstrand 2015; McGrath and Van Bergen 2015). An important health asset during the adolescent years is the degree of connectedness students have to their school and their teachers, that has a positive impact on educational

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outcomes (Klem and Connell 2004; Konishi et al. 2010; Niehaus, Rudasill, and Rakes 2012), health behaviours (Govender et al. 2013) and mental health (Klemera et al. 2017; Shochet et al. 2006). There is increasing consensus that educational attainment and wellbeing are interconnected and that a positive environment at school favours both educational and wellbeing outcomes (Bonell et al. 2014; Langford et al. 2015). Therefore, school connectedness presents itself as an important construct in the field of education, with studies indicating that commitment to school and positive relationships with teachers can prevent or reduce adolescents' involvement in risk behaviours, such as substance use (Bonell, Fletcher, and McCambridge 2007). A personal connection to a teacher has also been found to play an important protective role for low-income students (Nasir, Jones, and McLaughlin 2011) and those for whom parental support is low (Brooks et al. 2012).

The publication *Protecting Adolescents from Harm* by Resnick et al. (1997) represented one of the initial milestones in the study of school connectedness in adolescence. In 2004, the *Wingspread Declaration on School Connections* defined school connectedness as "the belief by students that adults in the school care about their learning as well as about them as individuals" and listed a number of academic and non-academic benefits from students' connections with their school.

The Wingspread Declaration was the result of a growing interest in school connectedness in the United States and was fuelled by numerous works conducted within the National Longitudinal Study on Adolescent Health, also known as the Add Health study. Notably, McNeely and Falci (2004) emphasised that different dimensions of school connectedness had a differential impact on the initiation of risk behaviours in adolescence, with teacher support in particular acting as a significant protective factor.

Recent research has drawn on McNeely and Falci (2004) and underlined the importance of teachers as fundamental elements in creating an environment that enables students to feel connected to their school (Waters, Cross, and Shaw 2010), with some studies focusing on teacher connectedness specifically (e.g. García-Moya et al. 2015). School connectedness and student–teacher relationships have also been considered to be fundamental for a successful transition to secondary education (Lester, Waters, and Cross 2013; Waters, Lester, and Cross 2014).

Although no systematic review of research on school connectedness has been published, Libbey (2004) conducted a valuable first analysis of progress in the field up to the publication of the Wingspread Declaration. Now more than a decade ago, Libbey (2004) pointed out that there was no unanimous accepted definition of school connectedness and that related concepts, such as school belonging, bonding, engagement and climate, were often used interchangeably in existing studies. In addition, this author concluded that measures were equally varied; they differed in the extent to which they included different components of school connectedness and many of them had unique elements.

Following works have tended to echo Libbey's conclusions and have called for greater conceptual clarity and a more precise operationalisation of school connectedness. For example, Whitlock (2006) noted that school connectedness seemed to have "chameleon-like properties", in the sense that it adopted multiple forms and names across different studies. In a review of the global term connectedness in child and adolescent literature, Barber and Schluterman (2008) voiced similar concerns that the definition and operationalisation of the construct of connectedness have been very varied and inconsistent across studies. In a

similar vein, in their review focused on counselling, Townsend and McWhirther (2005) found that definitions varied "from article to article" and "from author to author", although they suggested that this could be the result of the evolution of the concept of connectedness.

Twenty years since the publication of Resnick et al.'s (1997) study and with the literature suggesting that there may be aspects in need of refinement, it seems timely to revisit the conceptualisation of school and teacher connectedness, particularly as this area has grown rapidly in recent years. There is a need for greater clarity about what constitutes school connectedness and whether teacher connectedness is a component of school connectedness or a separate construct in itself. Moreover, there is a need to synthesise evidence on existing measures that can facilitate an in-depth understanding of the conceptualisation of these constructs.

Furthermore, with reviews about other central constructs in the study of relationships at school, such as belonging and climate, having been recently published (Allen et al. 2016; Wang and Degol 2016), a review with a specific focus on school and teacher connectedness can contribute to a clearer view of the field by providing an additional fundamental piece of evidence that allows for conceptual analysis of the commonalities and differences among these constructs.

The present review

The aim of this study was to conduct a scoping review to map research about school and teacher connectedness, in order to summarise evidence on the conceptualisation of these terms in adolescent research. For that purpose, we focused on the analysis of the actual definitions used and the ways in which these constructs have been operationalised in the main measures available for the assessment of school or teacher connectedness. Specific objectives for those main areas in this scoping review (definition and measurement) are presented in Table 1.

A scoping review methodology was selected for this study because, compared to a systematic review, it allows for a broader and more exploratory approach to mapping a variety of types of evidence on a topic of interest (Arksey and O'Malley 2005). Therefore, a scoping review fitted better with the aims of this study, which reflect a broad research question rather than the type of single-focus specific question that guides systematic reviews. This scoping review was informed by the methodological framework developed by Arksey and O'Malley, which follows a systematic procedure for searching and summarising the literature (Arksey and O'Malley 2005; Levac, Colquhoun, and O'Brien 2010).

Table 1. Specific objectives for the domains in the scoping review.

Domain 1: Definition
1.1. To map main definitions used in the studies of school and teacher connectedness to identify common elements and main differences across definitions and proposed links with other related concepts.
1.2. To examine the presence/role of teachers in the definitions of school connectedness.
Domain 2: Measurement
2.1. To provide an overview of measures available for the assessment of school or teacher connectedness based on the review of studies that develop or assess the psychometric properties of such measures.
2.2. To examine how school connectedness and teacher connectedness were operationalised in the measures proposed, i.e. what aspects of young people's experiences in schools or with teachers are being used as indicators of school and teacher connectedness.

Method

Inclusion and exclusion criteria

This scoping review included peer-review articles using the terms school connectedness or teacher connectedness published in English from 1990 to 2016 regardless of the type of study (i.e., including reviews, conceptual or theoretical papers and empirical quantitative and qualitative studies). The time period was chosen to ensure that any publications in the 1990s that may have preceded the paper by Resnick et al. (1997) could also be included. Because this review focuses on adolescent research, we included empirical studies in student samples with a mean age between 11 to 18 years and excluded those conducted in undergraduate samples or at earlier ages. We adopted an iterative approach to conduct our review, which allowed for subsequent steps to inform and refine the inclusion/exclusion criteria for each of the domains of interest (definition and measurement).

Search strategy

We searched SCOPUS, Web of Science, ERIC, the Cochrane Library and the EPPI Centre Database of Education Research using the free terms *connectedness*, *teacher* and *school* as keywords, typically using the following search query: (TITLE-ABS-KEY (teacher) OR TITLE-ABS-KEY (school) AND TITLE-ABS-KEY (connectedness)). Before selecting this strategy, a number of others were piloted and the results screened to look for a good balance between sensitivity and specificity. The electronic database searches were conducted in July, 2016. In terms of lateral searching, reference lists of selected papers were used to locate the original sources cited for definitions and/or measures, when applicable.

Selecting studies and charting data

Search results were downloaded into the reference management software Endnote X7 and identified duplicates were deleted. One author (IG) screened titles and abstracts identified by the electronic search and applied the selection criteria to potentially relevant papers. Two other authors (AJ and CP) independently reproduced the process, each with a different randomly assigned set of 20% of abstracts and full-texts. Reliability was high (percentage of agreement in the abstract screening and full-text eligibility phases reached 90.7% and 91.3%, respectively) and any disagreements were discussed and resolved by consensus. For selected studies data were extracted using a standardised spreadsheet which included information on: authorship and title, date of publication, country, type of study, sample and domain/s of the review informed (definition, measurement).

Any paper using the terms "school connectedness" or "teacher connectedness" was considered relevant for the definition domain. For the measurement domain, in line with the objectives presented in Table 1, only studies either developing or examining the psychometric properties of measures assessing school or teacher connectedness were considered relevant. The possibility of examining measures used in all empirical studies was considered. However, the screening phase revealed that the measures in numerous studies consisted of items adapted from existing scales, only used part of the items in a given measure or employed *ad hoc* items without sufficiently elaborating on the rationale for such decisions

or providing information on the psychometric properties of such measures. Therefore, those measures were deemed of little informative value for the purpose of our scoping review.

Summarising and reporting results

Data are presented in a narrative format and organised around the specific objectives set for each of the two domains presented in Table 1. Where helpful, tables are used to summarise relevant information.

For definition, we reviewed all the included papers in the scoping review and quantified the number of papers providing a definition (versus those that did not provide it or in which it was not clear) as well as how many mentioned an overlap with other related terms. Second, we mapped and tabulated the definitions for connectedness and school connectedness in the most frequently cited sources. Existing definitions of teacher connectedness were also identified. Our subsequent reporting focuses on summarising common elements across definitions of school connectedness and the role of teachers in them, as well as on definitions and use of the term teacher connectedness.

For measurement, relevant papers were organised around the main measurement tools they referred to. Reporting focuses on the following two aspects: (1) providing a list and brief description of the main identified measures; and (2) providing a synthesis on the ways in which school connectedness and teacher connectedness have been operationalised in those measures based on the analysis of the actual items used to assess those constructs. For that synthesis, we coded the aspects assessed using themes that were empirically derived from the examination of the items in each of the measures.

Results

As can be seen in Figure 1, which summarises the selection process, we identified 350 papers relevant for this scoping review. All were reviewed for the definition domain, and 20 papers were also deemed relevant for the measurement domain. An overview of studies' characteristics is provided as supplementary material (Appendix A, available online).

Definition

Sixty-six studies either mentioned the lack of consensus on an accepted definition or the fact that several terms have been used to refer to school connectedness. The most frequently mentioned terms were belonging, bonding, engagement, attachment, climate, support and relatedness. It was common that this kind of statement was followed by calls for further conceptual clarity (e.g. Whitlock 2006).

However, among the included studies, only 157 provided a definition of the construct, as opposed to 44 in which this was unclear (there was some attempt at description or some example provided for certain aspects but a full definition was not attempted) and 149 which provided no definition at all.

Among those who provided a definition, a small group used a global definition of connectedness ($n = 18$), whereas the majority provided specific definitions for school connectedness ($n = 139$). Definitions of global connectedness tended to be relatively homogenous (some examples are presented in Table 2), but there was a wider variety of definitions used

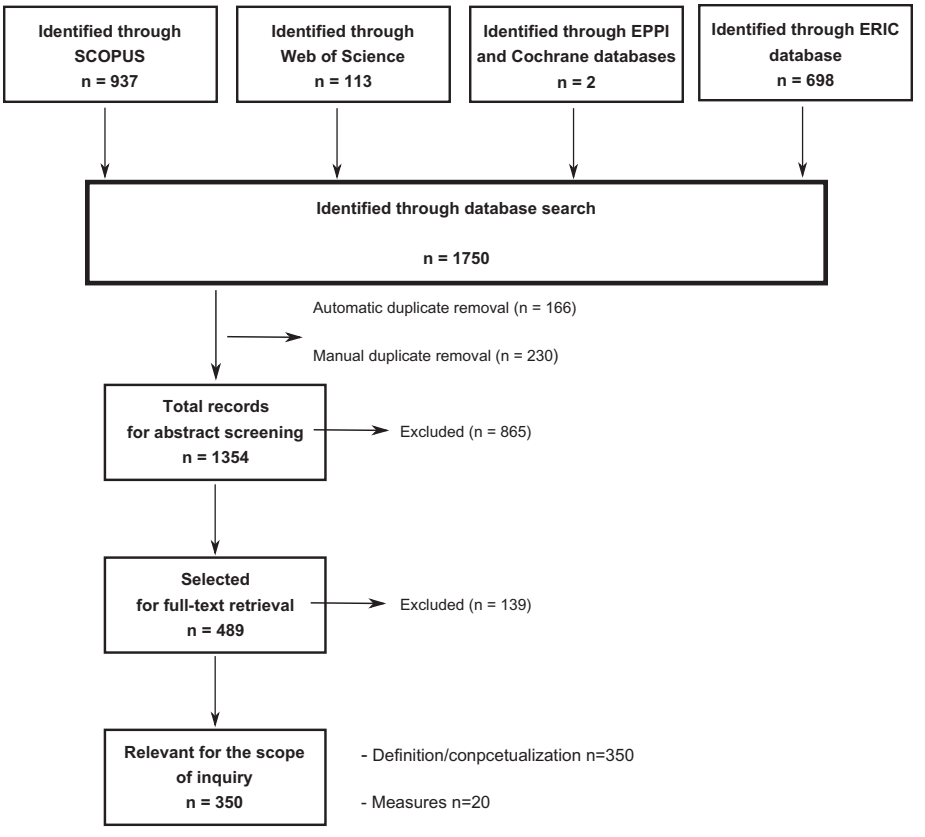

Figure 1. Graphical summary of the selection process.

for school connectedness, with 24 different established definitions and 33 studies where the authors used their own definition developed for that study. The most frequently cited definitions are summarised in Table 2.

Some of the definitions of connectedness used in the included papers were originally proposed as definitions of belonging (Baumeister and Leary 1995; Goodenow 1993) or bonding (Maddox and Prinz 2003). The literature on school engagement (e.g. Jimerson, Campos, and Greif 2003) has also influenced definitions of school connectedness that describe it as a multifaceted concept including affective, behavioural and cognitive dimensions (e.g. Chung-Do et al. 2015; Reed and Wexler 2014). In addition, connectedness has also been proposed as one of the components of relatedness (Hagerty et al. 1993).

Relationships in the school environment seem to be the core element shared by all definitions of school connectedness. Another common element in those definitions, although explicit to different degrees, was that when using the term school connectedness the focus is placed on the students' perceptions (*feelings, beliefs, sense of*…). Finally, the definitions tended either to refer globally to a connection to school environment as a context/setting (Libbey 2004; Resnick et al. 1997), focus on personal social interactions with some people in the school (Blum and Libbey 2004; Centers for Disease Control and Prevention, CDC 2009; Goodenow 1993; McNeely and Falci 2004; McNeely, Nonnemaker, and Blum 2002; Rowe, Stewart, and Patterson 2007; Wilson 2004), or encompass both (Bonny

Table 2. Most frequently cited definitions of connectedness and school connectedness identified in the scoping review.

Definition	Reference
CONNECTEDNESS	
A relational component, that is, the connection or bond that youth experience with socialising agents, and an autonomy component, that is, the degree to which youth feel that their individuality is validated or supported by their socialisation agents	Barber and Schluterman (2008, 211)
When a person is actively involved with another person, object, group, or environment, and that involvement promotes a sense of comfort, well-being, and anxiety reduction	Hagerty et al. (1993, 293)
A pervasive drive to form and maintain at least a minimum quantity of lasting, positive and significant interpersonal relationships	Baumeister and Leary (1995, 497)
A psychological state of belonging in which individual youth perceive that they and other youth are cared for, trusted, and respected by collections of adults that they believe hold the power to make institutional and policy decision[s]	Whitlock (2006, 15)
A movement towards others through affection and activity. […] One's perception of his or her own involvement in and affection for others, activities, and organisations	Karcher and Lee (2002, 93)
SCHOOL CONNECTEDNESS	
The extent to which students feel personally accepted, respected, included, and supported by others in the school social environment	Goodenow (1993, 80)
The belief by students that adults in the school care about their learning and about them as individuals	Blum and Libbey (2004, 231)
A concept that emerges from the interactions of the individual with the school environment	Resnick et al. (1997, 825)
The term used to refer to the study of a student's relationship to school	Libbey (2004, 274)
The belief by students that adults and peers in the school care about their learning as well as about them as individuals	Centers for Disease Control and Prevention, CDC (2009, 3)
When adolescents feel cared for by people at their school and feel like they are a part of their school	McNeely, Nonnemaker, and Blum (2002, 138)
Supportive and caring relationships within school	McNeely and Falci (2004, 284)
The connection a student has with their school, the school personnel, and the academic ideals espoused by the school	Maddox and Prinz (2003, 31)
An adolescent's experience of caring at school and sense of closeness to school personnel and environment	Bonny et al. (2000, 1017)
The sense of attachment and commitment a student feels as a result of perceived caring from teachers and peers	Wilson (2004, 293)
The quality of the social relationships or social "bonds" within school communities	Rowe, Stewart, and Patterson (2007, 526)

Note: Given that some variation existed in the wording used in different studies drawing on the same source for definition, we located and included in the table the definition as it appears in the original cited paper, for which the reference and page are also provided in the table.

et al. 2000; Maddox and Prinz 2003). When referring to personal interactions, definitions also varied in the degree to which they were specific about the individuals involved; ranging from the all-encompassing *others in the school* (Goodenow 1993) or *people at their school* (McNeely, Nonnemaker, and Blum 2002) to statements about *adults at school* or *school personnel* (Blum and Libbey 2004; Bonny et al. 2000; CDC 2009; Maddox and Prinz 2003), with only the definition by Wilson (2004) explicitly mentioning teachers.

In defining school connectedness, relationships with teachers seemed to be implicit in many of the definitions. Furthermore, several studies on school connectedness elaborated on the importance of relationships with teachers or underlined that element of school connectedness as one of the most influential (e.g. Allen et al. 2016; Bower, van Kraayenoord, and Carroll 2015; McNeely and Falci 2004; Vidourek et al. 2011; Waters, Cross, and Runions 2009). A few studies even provided specific definitions of teacher connectedness, as the "feeling that teachers care about you as a person and are interested in your learning" (Forrest et al. 2013, 188) or "feeling cared for, respected, and listened to by teachers in the school environment" (McLaren, Schurmann, and Jenkins 2015, 1692). In addition, the terms teacher connectedness, connectedness with teachers or student–teacher connectedness were used in 25 of the studies identified in this scoping review.

Measurement

For the purpose of examining how school and teacher connectedness were operationalised in the main measures, the review focused on the 20 empirical papers identified through the scoping review which presented measures of school or teacher connectedness or broader measures in which at least one of their subscales assessed school or teacher connectedness. These papers were grouped around the 10 measures they focused on (see Table 3).

Summary of identified measures

The first measures used in the study of school and teacher connectedness appeared in the 1990s: the Psychological Sense of School Membership, PSSM (Goodenow 1993), that despite being developed as a measure of belonging or psychological membership has been used in numerous studies to assess school connectedness, and the National Longitudinal study of Adolescents Health school connectedness scale or Add Health scale (Resnick et al. 1997).

Several of the identified studies aimed at further assessing the psychometric properties of those measures. You et al. (2011) analysed the factorial structure of the PSSM in a sample of Australian adolescents, concluding that the PSSM is a multidimensional instrument assessing three related aspects of school membership: caring relationships with adults, acceptance or belongingness and disrespect or rejection. In the case of the Add Health scale, a slightly different measure was proposed and used in a sample of more than 13,500 American adolescents by McNeely and Falci (2004) who, using a 6-item measure, identified two correlated but distinct factors: social belonging and perception of teachers. These two dimensions of school connectedness showed different effects in the initiation of the six examined risk behaviours. Furlong, O'Brennan, and You (2011) noted different versions of the Add Health scale being used following Resnick et al.'s (1997) study and identified wider consensus around a 5-item scale; they then used responses of more than 500,000 American students participating in the California Healthy Kids Survey to further assess its psychometric properties.

Table 3. List of identified measures including information on country and contents assessed.

Scale	Country	Content assessed	Assessment of school and/or teacher connectedness
Psychological Sense of School Membership (PSSM)	USA	Perceived belonging/ psychological membership in the school environment	Whole scale
National Longitudinal Study of Adolescent Health –5-item scale, Furlong, O'Brennan, and You 2011	USA	School connectedness	Whole scale
National Longitudinal Study of Adolescent Health –6-item scale, McNeely and Falci 2004	USA	School connectedness	2 subscales: • Social belonging – 3 items • Perception of teachers – 3 items
Hemingway Measure Of Adolescent Connectedness	USA	Connectedness in diverse domains of adolescent lives	2 subscales: • Connectedness to school – 6 items • Connectedness to teachers – 6 items
The School Connectedness Measure for Adolescents	USA	School connectedness	2 subscales: • Negative connectedness – 20 items • Connection with adults – 8 items
School Climate Measure (SCM)	USA	School climate	2 subscales: • Positive student–teacher relationships – 8 items • School connectedness – 4 items
Perceived School Experiences Scale (PSES)	USA	Perceptions of experiences at school	1 subscale: • School connectedness – 4 items
What's happening in this school (WHITS) questionnaire	Australia	School climate	2 subscales: • School connectedness – 8 items • Teacher support – 8 items
Middle Years Development Instrument (MDI)	Canada	Child wellbeing inside and outside of school	1 subscale: • Connectedness with adults at school – 4 items
The Students' Subjective Wellbeing Questionnaire (SSWQ)/ The Teachers' Subjective Wellbeing Questionnaire (TSWQ)	USA	Subjective wellbeing at school	1 subscale: • School connectedness – 4 items
Maryland Safe and Supportive Schools Climate Survey	USA	School climate	2 subscales: • Connection to teachers – 6 items • Whole-school connectedness – 4 items

They concluded that the Add Health 5-item scale was a unidimensional measure, with good reliability and validity and an invariant functioning across diverse sociocultural groups.

Several new scales have also been developed as adaptations of the Add Health scale or based on its main items. Chung-Do et al. (2015) included items on school attachment adapted from McNeely, Nonnemaker, and Blum (2002) in its 15-item Comprehensive School Connectedness Scale for program evaluation. Waters and Cross (2010) tested the psychometric properties of composite subscales on school and teacher connectedness consisting of modified items from the Add Health studies by Sieving et al. (2001) and McNeely and Falci (2004) in an Australian context and concluded that reliability was good for both school and teacher connectedness. However, this study also found some indications of multidimensionality within the school connectedness items, and its findings suggested that some items should be weighted more heavily in the composite score of school connectedness than others. Finally, the Student Perception of School Cohesion Scale is a 10-item measure in Spanish with items partly based on the Add Health scale assessing supportive relationships, school connectedness and teacher connectedness. The measure was tested in a sample of Salvadorian secondary school students, confirming the three hypothesised latent factors and showing good reliability and validity (Springer et al. 2009).

In addition, we identified other connectedness measures, such as the Hemingway Measure of Adolescent Connectedness and The School Connectedness Measure for Adolescents, which have emerged and been subjected to psychometric analysis in the last decade.

The Hemingway Measure of Adolescent Connectedness is a 74–item measure assessing 10 different domains of connectedness, among them school connectedness and teacher connectedness. Developed by Karcher (2001, as quoted in Karcher and Lee 2002), this scale has been tested in a Taiwanese sample (Karcher and Lee 2002), reporting good reliability and validity of all the subscales. This scale invariance across gender and ethnicity has been tested in American students (Karcher and Sass 2010) and cross-culturally between United States and Chilean adolescents (Sass et al. 2011). In addition, McWhirter and McWhirter (2011) examined the factorial structure of the scale in a sample of Chilean adolescents finding a highly similar structure to that originally reported by Karcher.

The School Connectedness Measure for Adolescents (Parker, Lee, and Lohmeier 2008, as quoted in Lohmeier and Lee 2011) is a comprehensive 54-item instrument developed following a matrix of different levels (general support/belongingness, specific support/relatedness and engagement/connectedness) and sources of connectedness (school, teachers/adults and peers). Its factor structure was examined in two different US samples showing good reliability and a seven-factor structure, including negative connection, connection with adults in the school, peer connections at school, school involvement, emotional connections, value school and comfort in this school (Lohmeier and Lee 2011).

Finally, we also identified a number of studies presenting instruments developed for the assessment of related aspects. These included the Perceived School Experiences Scale (Anderson-Butcher et al. 2012) on school experiences; the What's Happening in This School Questionnaire (Aldridge and Ala'l 2013), The Maryland Supportive and Safe School Climate Survey (Bradshaw et al. 2014) and the School Climate Measure (Zullig et al. 2010, 2014, 2015) on climate; and the Students' Subjective Wellbeing Questionnaire (Renshaw 2015; Renshaw, Long, and Cook 2015a, 2015b) and the Middle Years Development instrument (Schonert-Reichl et al. 2013) assessing subjective wellbeing in the school. These measures were kept

in the review because they included subscales on school connectedness, teacher connectedness or both (see Table 3).

Operationalisation of school and/or teacher connectedness

Table 4 provides an overview of how school and teacher connectedness were operationalised for the identified measures. The specific items used for the assessment of school connectedness and teacher connectedness in each of the measures are presented as supplementary material (Appendix B, available online).

As summarised in Table 4, examination of the items in the identified measures revealed that scales or subscales on school connectedness tended to include the following common aspects: individual's perceptions and feelings of acceptance and care, respect and support from others at school (mostly teachers and other adults) and the extent to which students like/enjoy going to their school (including also negative formulations describing school as boring or causing other similar negative feelings).

In contrast, other aspects were only included in certain measures. For example, safety (*I feel safe in my school*) was only included in the Add Health school connectedness measure. In addition, some items in the Hemingway Measure of Adolescent Connectedness stressed the students' efforts (e.g. *I work hard at school*; *I always try hard to earn my teachers' trust*) and perceived importance of school or relationships with teachers (e.g. *Doing well at school is important for me*; *I care what my teachers think of me*), aspects that were also covered although to a lesser extent in the connection with adults subscale (*I try making my teachers happy*) by Lohmeier and Lee (2011), but did not seem to be covered in the remaining measures.

Furthermore, although belonging was present in most of the identified measures, there was variability in the extent to which it was covered in the different measures. The PSSM was the one which covered belonging most extensively, whilst the Add Health, PSES, WHITS and SSWQ included one item covering this aspect of connectedness. Other measures, specifically the Hemingway Measure of Adolescent Connectedness, the School Connectedness Scale for Adolescents, and the School Climate Measure, did not include this aspect.

In terms of the presence of teacher–student relationships in the reviewed measures (see Table 4, third column from the right), we found that 7 out of the 10 measures had specific subscales for teacher connectedness or other related aspects. Specifically, there is a separate subscale on teacher connectedness in the Hemingway Measure of Adolescent Connectedness and in the Maryland Safe and Supportive Schools Climate Survey. There are separate subscales labelled as *perceptions of the teachers*, *positive student–teacher relationships* and *teacher support* in the items proposed by McNeely and Falci (2004), the School Climate Measure and the WHITS questionnaire respectively. In addition, a subscale on connection with adults at the school was available in the School Connectedness Scale for Adolescents (9 items, 5 of which are referred to teachers) and the MDI (3 items that asked about "teachers or another adult" at school).

In contrast, relationships with teachers were included but subsumed within global school connectedness assessments in the two most frequently used scales, the PSSM and the 5-item Add Health school connectedness measure, as well as in the PSES and the negative connectedness subscale in the School Connectedness Scale for Adolescents.

Finally, if we focus on the phrasing used in the subscales or items about relationships with teachers, most were phrased with a focus on the individual student's relationship with their teachers (e.g. *The teachers here respect me, my teachers care about me, I have meaningful*

Table 4. Summary table on the operationalisation of school and teacher connectedness in the identified measures.

	OPERATIONALISATION OF SCHOOL CONNECTEDNESS AND/ OR TEACHER CONNECTEDNESS								
	Operationalization of school connectedness						Presence and operationalisation of teacher connectedness as part of broader or specific assessments		
SCALE NAME	Acceptance/care	Belonging	Liking/enjoyment	Respect	Support	Others	Student–teacher (S-T) relationships	Main elements in subscale on S-T relationships (if any)	Type of phrasing of S-T relationships items
Psychological Sense of School Membership (PSSM)	X	X		X	X	Friendly, expectations (high)	Subsumed in school connectedness	N/A	Individual level
National Longitudinal Study of Adolescent Health –5-item scale		X	X			Closeness, fair treatment, safety	Subsumed in school connectedness	N/A	Whole-school level
National Longitudinal Study of Adolescent Health –6-item scale		X	X			Closeness	Subscale: Perception of teachers	Care, relationship quality, fair treatment	Individual and whole-school level
Hemingway Measure Of Adolescent Connectedness			X			Success, effort, importance	Subscale: Connectedness to teachers	Liking, relationship quality, effort, perceived importance	Individual level
The School Connectedness Measure for Adolescents	X	X	X		X	Negative relationships	Subsumed & Subscale: Connection with adults	Care, support, friendly, effort	Individual and whole-school level
School Climate Measure (SCM)			X			Initiative, reward	Subscale: Positive student–teacher relationships	Care, support, relationship quality, communication	Individual and whole-school level
Perceived School Experiences Scale (PSES)		X	X			Meaningful relationships	Subsumed in school connectedness	N/A	Individual level

What's happening in this school (WHITS) questionnaire	X	X	X	X		–	Subscale: Teacher support	Care, support, know students, communication	Individual level
Middle Years Development Instrument (MDI)	N/A	N/A	N/A	N/A	N/A	N/A	Subscale: Connectedness with adults at school	Care, communication, high expectations	Individual level
The Students' Subjective Wellbeing Questionnaire (SSWQ)/The Teachers' Subjective Wellbeing Questionnaire (TSWQ)	X	X		X		–	Not explicitly included	N/A	N/A
Maryland Safe and Supportive Schools Climate Survey		X	X			–	Subscale: Connection to teachers	Care, respect, communication, trust, attentiveness, reward	Individual and whole-school level

N/A = Not applicable.

relationships with teachers at my school), but some were phrased at a broader whole-school level, i.e. asking about the student's perception of teachers' general relationships with students in the school (e.g. *The teachers at this school treat students fairly* or *Teachers at my school care about their students*). Whereas the PSSM, the Hemingway Measure of Adolescent Connectedness, the PSES, the WHITS and the MDI used only the former type of phrasing, the only item referring to teachers in the 5-item Add Health school connectedness scale was placed at the latter level. Other measures such as the SCM, the Maryland Safe and Supportive Schools Climate Survey, and the items on teacher perceptions by McNeely and Falci (2004) presented a relative balance between items formulated at the individual and the whole-school levels. The specific items of each type in each of the examined measures can be seen in supplementary material (Appendix B, available online).

Discussion

This scoping review found a growing body of research relating to school and teacher connectedness in adolescent research, with a marked upward trend in published papers from the 1990s to 2016. The review identified a great variability in the definition and operationalisation of the term school connectedness, with only a small number of studies focusing specifically on teacher connectedness. To date the majority of studies on school and teacher connectedness have been conducted in western countries, especially the United States. However, there is an increasing body of work from other countries, such as China (Lau and Li 2011; Li et al. 2013; Yuen et al. 2012), India (Zou, Ganguli, and Shahnawaz 2014), South Africa (Govender et al. 2013; Johnson and Lazarus 2008), Brazil (Anteghini et al. 2001) or Chile (McWhirter and McWhirter 2011; Sass et al. 2011).

How have the terms school connectedness and teacher connectedness been defined and operationalised?

Almost half of the studies failed to provide a definition of school connectedness and, among those that did provide a definition, there was no unanimously accepted definition of school connectedness. Nevertheless, common elements across the identified definitions suggest the following appear to be considered essential, central features of the school connectedness construct: (1) it refers to relationships taking place within the school environment; (2) it is the individual's perceptions and feelings in those relationships which are considered important; (3) it can be conceptualised at two different levels (or as a combination of both): either referring to feelings towards the whole school as an institution or community, or to those experienced as the result of specific one-to-one social interactions at schools. In terms of the latter, although some of the definitions were quite vague about the persons involved in those interactions, when specified most referred to adults or school personnel, including teachers.

By examining how school connectedness was operationalised in the main instruments proposed for its assessment, this review was able to map specific common elements that characterise how school connectedness is being conceptualised, including care, respect and support in relationships at school and positive feelings of liking or enjoying school. However, it was also apparent that the identified measures vary in the extent to which they cover these aspects and some of the measures also have their unique elements. Therefore, depending

on the measure picked by the researcher, aspects such as safety, reward, student's initiative, perceived importance, etc. may or may not be included in their assessment of school connectedness. This has important implications in terms of the comparability of evidence from different studies on school connectedness.

Research on the factorial structure of the identified scales provided additional information for the conceptualisation of school connectedness, suggesting that school connectedness is a multidimensional construct. Measures such as the PSSM and Add Health connectedness scales, which provide only one global score for connectedness in the school, may need refining in light of more recent studies suggesting there is evidence of multidimensionality in these scales (e.g. Waters and Cross 2010; You et al. 2011). These scales, for example, do not allow for a separate assessment of teacher connectedness, since relationships with teachers are subsumed within a broader assessment of school connectedness.

Our scoping review showed that the study of teacher connectedness is a developing though still limited area of research. Only a reduced number of studies used this term, whose definitions tend to emphasise perceptions of teachers as caring, respectful and willing to listen to their students. These aspects have also been identified as important by qualitative studies (Allen et al. 2016; Yuen et al. 2012), although additional elements, among others being known by teachers and receiving support (Chhuon and Wallace 2014; Shulkind and Foote 2009), may be important features of teacher connectedness but are not traditionally included in the definitions. Further attention to students' voices, as also recommended in a recent study of students' narratives about memorable teachers (Koehler, Newby, and Besser 2016), may be useful to reach a more comprehensive conceptualisation of teacher connectedness. Regarding the operationalisation of this term in existing measures, most of them consistently include relationship quality, care, support and communication; yet, depending on the measure other aspects such as respect, fair treatment, high expectations, reward, etc. are or are not explicitly covered in the assessment.

Critical assessment of the review findings

Given the long trajectory of adolescent research about school connectedness, the high number of studies not providing a definition of the construct is concerning. In addition, existing definitions are often not specific about the phenomenon of interest, which may explain why many studies resorted to their own *ad hoc* definitions. Barber and Schluterman (2008) expressed concern that a vague definition of connectedness could lead to the concept being used to refer to such a wide variety of social experiences in a developmental context that it would lose meaning and practical relevance.

Therefore, in order to be useful, the construct of school connectedness needs to be more clearly and specifically delineated in a definition that can be used consistently across future studies. The extent to which this is attainable must also be thoroughly examined, since at least two potentially distinct constructs are evidenced in existing definitions and operationalisation of the term: perceptions referred to the school as institution or whole community and perceptions of social relationships taking place at the school. This duality also seemed to be apparent to some extent in the way items assessing connectedness with teachers were operationalised. Although phrasing was usually consistent with an emphasis on the individual's perception, asking the student to report on aspects of their individual dyadic relationships with teachers, other items (the ones which were labelled as whole-school level)

referred to a global judgement of student–teacher relationships in the school. These two levels can arguably be seen as two different realities, and therefore the assessment at one and the other level may show different results.

In addition, it would be beneficial that further research is conducted in non-western and southern countries. Research seems to suggest that school connectedness is associated with health in a wide range of countries, including existing studies in Asia, Africa and South America (e.g. Anteghini et al. 2001; Govender et al. 2013; Lau and Li 2011). However, some differences in the meaning of connectedness or the salience of the elements of school connectedness associated to differences among educational systems or cultural factors may exist. For example, in a recent study of power in student–teacher relationships (Wong 2016), cultural aspects such as a culture of respect or a traditional emphasis on high attainment in school were considered important factors to understand relationships in the Chinese context. Therefore, although this review provides a current overview of research in the field that can be of interest for an international audience, more attention should be paid to cross-cultural differences that may affect conceptualisation and measurement of school connectedness. Researchers (Karcher and Lee 2002; McWhirter and McWhirter 2011; Sass et al. 2011) have started to explore this issue and tried to identify universal and culturally specific elements of school connectedness. This is an important area for further research.

Finally, findings in our scoping review suggest that an important challenge in the study of school connectedness is that factorial analyses reveal that some of the widely used global assessments of the construct may be conflating separate dimensions of school connectedness. Furthermore, as pointed out by Chung-Do et al. (2015), in other studies only one of the dimensions of school connectedness is used, but it is taken as a measure of the whole construct. Our review findings seem to indicate that multidimensional measurement can provide a more accurate assessment of school connectedness, and arguably more informative results for the design of interventions in this area (Chapman et al. 2013; Chung-Do et al. 2015). In a similar vein, if school connectedness definitions tend to be broadly constructed as a means to encompass a range of school-based experiences it may then be preferable to employ school connectedness as a broad umbrella term but use more specific definitions and measures for its different dimensions (global feelings toward school, teacher connectedness, etc.).

Moving forward: school and teacher connectedness in the broader context of research on school experiences

One of the rationales for this review was the concern initially expressed by Libbey (2004) about the variability of definitions and measures of school connectedness, which this review also identified more than a decade later. Making progress in this respect should be a priority. Numerous studies still fail to provide a definition of school connectedness. Even when defined, the current lack of consensus makes it difficult to undertake comparisons between studies thereby preventing the building of a coherent body of evidence to inform interventions aimed at improving young people's academic and health outcomes by reinforcing school and teacher connectedness (see e.g. Chapman et al. 2013). Therefore, future research should be clear in the definition of the constructs they work with, favour the use of existing validated measures when available and appropriate, and ensure consistency between the definition used and the operationalisation of the connectedness construct in the selected measure.

Furthermore, based on research providing evidence of the multidimensionality in some of the global scales used for the assessment of school connectedness (e.g. You et al. 2011) and studies showing differences in the associations between different elements of school connectedness and adolescent outcomes (McNeely and Falci 2004), attention should be given to unpacking the global concept of school connectedness and examining its different components separately rather than as part of a global composite. One key component of school connectedness is teacher connectedness, which according to this review was present in most conceptualisations of school connectedness and has started to be studied separately as an important dimension in its own right (e.g. Forrest et al. 2013; García-Moya et al. 2015). Another line of future research should be the examination of the potential impact of the different levels at which items around this content have been formulated. It could be argued that global level indicators may be more useful when trying to assess or design interventions to improve teacher–student relationships in a school, whereas individual-level items may be more sensitive when the aim is to assess the impact of teacher relationships in individual outcomes, but this hypothesis needs to be tested.

Finally, statements on the lack of a common accepted definition of school connectedness were usually followed by mentions to its links and potential overlap with a range of other concepts such as belonging, bonding, climate and engagement. Although it is positive that this challenge is widely acknowledged, little progress seems to have been made in clarifying the commonalities and differences between these constructs. Conceptual and empirical work is greatly needed to make progress in this area.

In our scoping review, we made the decision not to assume these terms are synonyms of connectedness. Instead, we adopted a comparatively narrower focus which allowed us to obtain a clearer picture of how the specific terms school and teacher connectedness have been defined and operationalised in existing research. We mapped existing studies using the terms school and teacher connectedness and synthesised the information on definitions and operationalisation to delineate what is actually being studied under these terms. Thanks to that, the results of this scoping review can be useful to understand where the constructs of school and teacher connectedness fit within the broader study of school climate and its commonalities and differences with other constructs such as belonging, bonding and engagement, concepts for which literature reviews have been published in recent years (Allen et al. 2016; Jimerson, Campos, and Greif 2003; Maddox and Prinz 2003; Thapa et al. 2013; Wang and Degol 2016). In these final lines, we consider how the findings of the present review about school and teacher connectedness fit with the literature in the broader field of school climate.

The two most recent reviews on school climate both support the idea that school climate is a multidimensional construct that tries to capture school experiences and include the following main domains: academic or teaching and learning aspects, community or relationships, safety and institutional environment (Thapa et al. 2013; Wang and Degol 2016). Therefore, rather than a single construct, school climate represents an important area of research from which more specific constructs such as school and teacher connectedness can be traced. Whilst both reviews on school climate included school and teacher connectedness, they differed in the place where these were located. School connectedness and specific relationships are considered as separate dimensions in the community domain by Wang and Degol (2016). In contrast, teacher connectedness is seen as being part of the relationship component and school connectedness part of the institutional environment in

the model proposed by Thapa and colleagues (2013). Our scoping review identified relationships as a central component in the definition and operationalisation of school connectedness, but also showed that this element was often combined with others referring to global feelings toward school. The fact that both reviews of school climate consider perceptions of specific relationships and global feelings towards the school as an institution as two different aspects supports our recommendation to unpack school connectedness into its different components. The literature on school climate can also be useful to clarify the place of other elements, such as safety. Although we found that safety was included in the operationalisation of school connectedness in one of the reviewed measures, it is considered to represent a distinct domain of its own in both reviews of school climate.

Other reviews in the field have drawn on the differences between affective, cognitive and behavioural dimensions to try to clarify definitions in this area (Jimerson, Campos, and Greif 2003; Maddox and Prinz 2003). The distinction in our scoping review between school connectedness, referring to global feelings towards the school as an institution, and teacher connectedness, which focuses specifically on student–teacher relationships, chimes with the incorporation of two affective dimensions (attachment to school and attachment to personnel) in the multidimensional model of school bonding proposed by Maddox and Prinz (2003). The difference between affective, cognitive and behavioural aspects of school experiences can also help us to distinguish school and teacher connectedness from school engagement, which according to Jimerson, Campos, and Greif's (2003) review tends to be measured by means of observable behaviours (academic effort, involvement in school activities…) and rarely includes affective and cognitive elements.

The links between school connectedness and belonging seem to be particularly complex. Belongingness and connectedness have been considered important human needs, which are satisfied by means of positive stable interactions with others (Baumeister and Leary 1995; Townsend and McWhirter 2005) and the definition of belonging in the recent metanalysis by Allen et al. (2016) included both student–teacher relationships and student's general feelings toward the school. Based on this, it would seem that the terms school belonging and school connectedness are very close and may even be seen as synonyms. Indeed, our scoping review showed that the PSSM, which was proposed for the assessment of membership and belonging, is frequently used in studies of school connectedness and, in addition, Goodenow's definition for school belonging has been adopted in some studies of school connectedness. However, some of the above-mentioned reviews conceptualise belonging as the specific feeling that one is part of the school community (Jimerson, Campos, and Greif 2003; Maddox and Prinz 2003). If adopting this later conceptualisation, belonging would then refer to one of the feelings, along with others such as pride (Maddox and Prinz 2003) or a broad sense of caring and support (Jimerson, Campos, and Greif 2003), which are included in school connectedness when referring to global feelings towards school as an institution.

In summary, when the findings of this scoping review are put into a broader context, it seems that school connectedness can be consistently seen as an important construct in the community or relationships domain of school climate. However, a clear definition of school connectedness is challenging due to the coexistence of two arguably different constructs under the same label, one represented by feelings toward the school as an institution (including the relationships with others at the aggregated school level) and one which would

address the perception of specific relationships at schools, such as relationships with teachers.

Broad definitions and operationalisation of school connectedness increase the likelihood of overlap with other constructs. School as an institution and specific relationships are distinct levels and even when focusing on specific relationships it is possible to make distinctions between relationships with teachers, with classmates and with others at schools. Therefore, our recommendation to unpack the concept of school connectedness into the specific personal relationships and feelings towards schools it comprises can contribute to the greatly desired conceptual clarity in this area and facilitate empirical examination of the interrelations between all the above-mentioned constructs.

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