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The impact of education selection according to notions of intelligence: A systematic literature review

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ABSTRACT

This paper reports on a systematic review of how intelligence-based classification within schools shapes lives and identities of individuals, families and communities. Formal education has long divided learners, formally and informally between and within schools. These practices have remained in place despite strong evidence to suggest they are problematic, both in relation to the equitable nature of the practices involved and in their impact upon pedagogy, expectations and outcomes. This review examined what was known about the impact of intelligence-based selection upon people's lived experience, in the short term and longitudinally.

From 3643 possible papers published since 1944, only 85 had a focus upon children's schooling, intelligence-based selection, and the lives and identities of individuals, families or communities. It was evident that very little consideration has been given to longitudinal impact of selection practices, including a paucity of life history approaches.

Three broad strands of intelligence classification research were evident related to:

- entrance examinations/criteria/Standardised Assessment Tests (SATS)
- gifted and talented
- streaming/setting/tracking

with most concentrating upon a single selection mechanism and quantitative measures. Looking across these strands, educational selection was seen to impact on people's lives, identities and relationships, creating and perpetuating social hierarchies and divisions. It was overall a conflicted experience with more negative effects than positive. However, the literature largely failed to investigate the broader, interconnected influences of the knowledge hierarchy and its impact upon people's lived experiences.

1. Introduction

Notions of intelligence are a defining feature of education (Swann, Peacock, Hart, & Drummond, 2012) and of people's place in wider society. Status is commonly defined by an ability to demonstrate specific knowledge in specific contexts, with superior status to those with the knowledge and even greater status to experts who can deepen that knowledge (Schön, 1983). This knowledge hierarchy (Rix, 2006) is evident in both our formal and informal relations within schools and beyond. Within educational contexts, the formal terms have altered across the years but the concepts continue to serve similar functions (eg: special educational needs, learning difficulties, exceptionality, giftedness). Within European settings, as a result of developing theological doctrine, selection in school arose at the same time as the notion of "a specifically human intelligence as a natural phenomenon controlled by

the necessary laws which operate on a person-by-person basis" (p172, Goodey, 2011). Disagreements about the existence, nature and form of intelligence have been evident since then. This contestation has also included the connection between intelligence and ability, with 'ability' often seen by practitioners and policymakers as a proxy of 'intelligence' (Gillborn & Youdell, 2001) and with in-school 'ability hierarchies' still much in evidence (Tereschenko, 2019).

From as early as the 1920's Directors of Education in Australia began to use tests based on notions of intelligence to create classes for "children of mental ability much above the average" (Braggett, 1985). More widely, formal, compulsory education started to be divided up between academic and vocational streams, echoing the notion of the continuum of special education which also began to be described in the late 1960's and 1970's, based on the belief that the needs or abilities of a child can be identified and that they can be allocated to the correct space within

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Table 1
Use of setting in England in 2010/11 - (Dracup, 2014).

	Primary (Year 6)	Secondary
Maths	19% (34%)	71%
English	11% (19%)	58%
Science	2% (3%)	62%

an array of educational provision (Rix et al, 2015). The wide variety of forms that this provision takes can be broadly seen as being:

- external grouping which formally or informally places people in different schools
- internal grouping which formally or informally places people in different groups within schools (Triventi et al, 2016a)

The terminology for such separation varies across countries, but notions such as tracking, educational stratification, ability grouping, sorting, streaming, setting, banding or differentiation generally refer to “the allocation of students into an educational environment that is more homogeneous in terms of the students’ cognitive abilities” (Reichelt, Collischon, & Eberl, 2019, p1326).

The form that such separation can take also varies not only across countries but also within them. For example in the UK in 2019 there were still 163 selective Grammar schools in England and 69 in Northern Ireland even though the tripartite system of which they were part was formally replaced with the comprehensive system in 1976. Within schools, group allocation, although formally not recorded, was also prevalent (see Table 1).

It has been argued that ability grouping allows students to focus on “subjects of particular interest or to receive extra help in a weak subject” (Ellison & Hallinan, 2004). Researchers have also suggested that it facilitates teaching by individualizing instruction; enables teachers to adapt teaching to class level; reduces boredom for advanced students; and encourages slower students to participate. More broadly it is seen by some as an effective way of selecting and channelling human resources (Ansalone, 2010). However, ability grouping either within schools or between schools, has also been shown to be problematic. As identified in a recent review of the literature (Francis et al, 2017), it leads to:

- misallocation to groups;
- lack of fluidity of groups;
- a self-fulfilling prophecy.

As a result of:

- teacher expectations of pupils;
- quality of teaching for different groups;
- pedagogy, curriculum and assessment applied to different groups;
- pupil perceptions and experiences of ‘ability’ grouping;

In addition, regardless of the shifting nature of the way in which school systems organise their resources and students, and regardless of whether an educational system is formally tracked or whether it applies informal and more ‘hidden’ forms of differentiation, the more prestigious routes within education systems produce a life that later-on is better-off (Triventi et al, 2016b).

Set against this background are a variety of ongoing social and economic inequalities (Dauderstädt & Keltek, 2017) which may in some way be connected to these selection processes. It is possible, for example, that the kinds of verbal and physical abuse and discriminatory practices experienced by people identified with learning disabilities (Tilly 2008; Gravell 2012; Mencap, 2012), the poor educational experiences of low-income children (Odgers & Adler, 2018) and increasing mental health challenges (Shelemy et al, 2019) are informed by the way in which the knowledge hierarchy is instituted within schools. Our empirical evidence in this regard is very limited. The voices of students

is sparse in relation to experiences of ability grouping within schools (Tereshchenko et al, 2019), but we also lack studies which explore the influence of allocating students on society’s re-creation of its fundamental structures and relations, on its social reproduction, and its impact upon equality and life chances (Reichelt, Collischon & Eberl, 2019, p1326). The focus upon ability and terms associated with selection also discourages an exploration of our relationship with the concept that underlies them, intelligence.

In order to explore what is known about such connections and how they may be playing out in research which recognises the foundational importance of intelligence, we undertook a comprehensive review of the literature seeking to answer the following question:

To what extent does the literature offer insights into whether and, if so, how ‘intelligence’ based classification within schooling shapes lives and identities of individuals, families and communities?

2. Method

The research team drew upon their experience with protocols established by the Evidence for Policy and Practice Information and Coordinating Centre (EPPI-Centre) to design a systematic search of the literature. Our keyword terms involved a two-level search strategy (see Table 2).

In framing this search we deliberately limited the terms associated with intelligence and avoided the many possible proxy terms. This was to reduce the chance of reporting on studies that had a possible or implicit link to intelligence rather than an explicit link. We also recognised the breadth of international variations in relation to the terms which can be applied and the limitations of working with English language texts. Consequently, we chose to add terms which had significance in education systems based upon an English model. We did not however exclude papers which used additional national terminology which emerged in the search. In addition, we used search terms which would identify both qualitative and quantitative sources, even though our aim to explore the shaping of lives might seem more suited to the qualitative field. We recognised that quantitative methods might capture voices and experiences in ways we did not anticipate.

We sought entire journal articles and literature reviews, published after 1944. This reflected the introduction of three key terms associated with the English model of a tripartite educational system (grammar, secondary modern, technical schools) and the term ‘ineducable’. The search took place between August-October 2018. We searched on the following databases in order to draw in papers from education, health, social sciences, arts & humanities with an extended historical and national range:

- EBSCO, BEI, Ed Research Complete, ERIC, PsychInfo (2274 papers)
- SCOPUS (1761 papers)
- JSTOR (268 papers)

Whilst EBSCO gave us the capacity to focus on specific education and psychology databases, Scopus gave us broad access to 24,000 journals across disciplines and JSTOR ensured a focus across humanities and social sciences, providing an additional sweep to the Scopus offer. Given the fundamental importance selection according to notions of intelligence plays to many life experiences, we also presumed that there would be sources which were not captured by the systematic search because of the inherent bias in our selection terms and inclusion/exclusion criteria. Prior to undertaking the systematic review the second author undertook a narrative scoping review. In this review we identified some pertinent books (Jackson & Marsden, 1966; Chitty, 2009) and university theses (e.g. Heyes, 2004), which were missing from the systematic review, but more generally this earlier analysis helped validate both our search terms and provided a high degree of confidence in their application and the relevance of our analysis. A limitation of our approach is that we did not undertake evaluative analysis of the statistics within the papers, nor extract individual participant data (Ahmed, Sutton, &

Table 2
Search terms related to ‘intelligence’ and ‘selective education’.

First Tier: ‘Intelligence’	Second Tier: Selective Education Practices
“intelligence level” OR “intelligence test*” OR “intelligence quotient” OR “IQ”	AND “education* classification” AND “selective education” OR “selective school*” AND “school admission” OR “school entrance exam” AND “bilateral school” OR “comprehensive school” AND “bilateral school” OR “comprehensive school” AND “grammar school” OR “technical school” AND “secondary modern” AND “primary school” AND “special school” AND streaming OR grading OR “eleven plus” OR “eleven-plus” OR “11-plus” OR “11 plus”

Table 3
The inclusion/exclusion criteria.

Inclusion criteria	Exclusion criteria
1 Must have a focus upon classification of intelligence	1 Does not have a focus upon classification of intelligence
2 Must have a focus upon lives and identities of individuals, families or communities	2 Does not have a focus upon lives and identities of individuals, families or communities
3 Must have a focus on children’s education	3 Does not have a focus on children’s education
4 Must be an empirical study and/or personal narrative	4 Is not an empirical study and/or personal narrative
5 Focus upon classification of intelligence is not only a measure of a sample within a study	5 Only focuses upon classification of intelligence as a measure of a sample within a study
6 Must be published after 1944	6 Is published before 1944
7 Must be in English	7 Is not in English
8 Must be available electronically	8 Is not available electronically

Riley, 2012) but relied upon the findings and our overall evaluation of the papers in order to undertake a thematic analysis.

The search identified 4303 papers. We sought to limit our inclusion/exclusion criteria to maximise the breadth of studies (see Table 3). By use of the term ‘a focus’ we anticipated a paper went beyond a mention of an issue or beyond being descriptive or providing information as a background factor. At the outset we had 7 criteria, however we soon came to recognise that a great many papers met the inclusion criteria, but only met criterion 1 because a measure of ‘intelligence’ was a means to defining their sample in some way and so provided no meaningful data in relation to the other foci. As a result, we introduced criterion 5 and revisited all the previously examined studies.

A review of abstracts and titles was undertaken (see Fig. 1). After removing duplicates and those not meeting the inclusion criteria, we had 202 studies in total. Of the 3441 papers excluded in this phase, 40 were excluded under more than one criterion without the reviewers agreeing which exclusion to use. It was decided given the numbers involved and the time available to the reviewers to curtail discussion as we had both agreed to exclude. During this moderation process the reviewers also felt, due to our broad understanding of the term ‘focus’, that we may be including papers which on closer examination would not merit inclusion. Rather than wait until the full evaluation of the papers, a second phase assessment of the papers was therefore undertaken, initially involving a skim-read by one researcher, then moderated by the second and reviewed by both. As a result, a final total of 85 papers were identified for inclusion within the review.

A three-part, data extraction and analysis process was then undertaken involving both reviewers. In phase one an overarching document was created which included all the extracted information from the papers. Prior to beginning data-extraction a moderation exercise was undertaken on two papers to ensure coherent and shared understanding of the types of data we were seeking. Information was sought under the following headings, Date & Country, Demographic, Assessment Type, School/Establishment, Research Type/Method, Key Findings, Weight of Evidence, Extracts from paper. The reviewers decided weight of evi-

dence in light of 1) a paper’s capacity to answer the review question and 2) from their interpretation of its overall assessed reliability and trustworthiness. A primary factor in arriving at a decision about these two factors was the degree of detail provided within the paper and its capacity to enable the reviewer to envisage and evaluate the study it reported. This enabled us to take into account the quality of execution, appropriateness of design and relevance of focus of the study. The extracts selected from each paper related in particular to narratives or other data about the shaping of lives and identities of individuals, families or communities through intelligence-based classification. We also extracted any discussion or description which might inform us of about understandings within the wider field related to the main question.

After the information had been extracted, a thematic analysis was undertaken on the extracted data, using an approach drawn from grounded theory (Corbin and Strauss, 2008). Through open coding, the data were refined to identify concepts which represented aspects of that data. The relevant evidential quotations were allocated to emergent themes. We did not seek a point of saturation but continued to allocate to themes to enable a broader picture of the literature. Subsequent to the thematic analysis, the extracted information was summarised. This summary document was then further reduced and a numerical representation of the data was undertaken, followed by a re-examination of the summaries to seek patterns and to enable categorisation of findings for write up. This last phase of analysis involved a process of comparison, moving between the different summaries and the original documents to ensure that studies were being accurately represented and that appropriate interpretations were being drawn.

3. Results

From 3643 possible papers published since 1944, only 85, from 14 countries and 3 international studies, had a focus upon children’s schooling, intelligence-based selection, and the lives and identities of individuals, families or communities. This literature is dominated by quantitative studies, with a focus upon educational selection’s impact upon aspira-

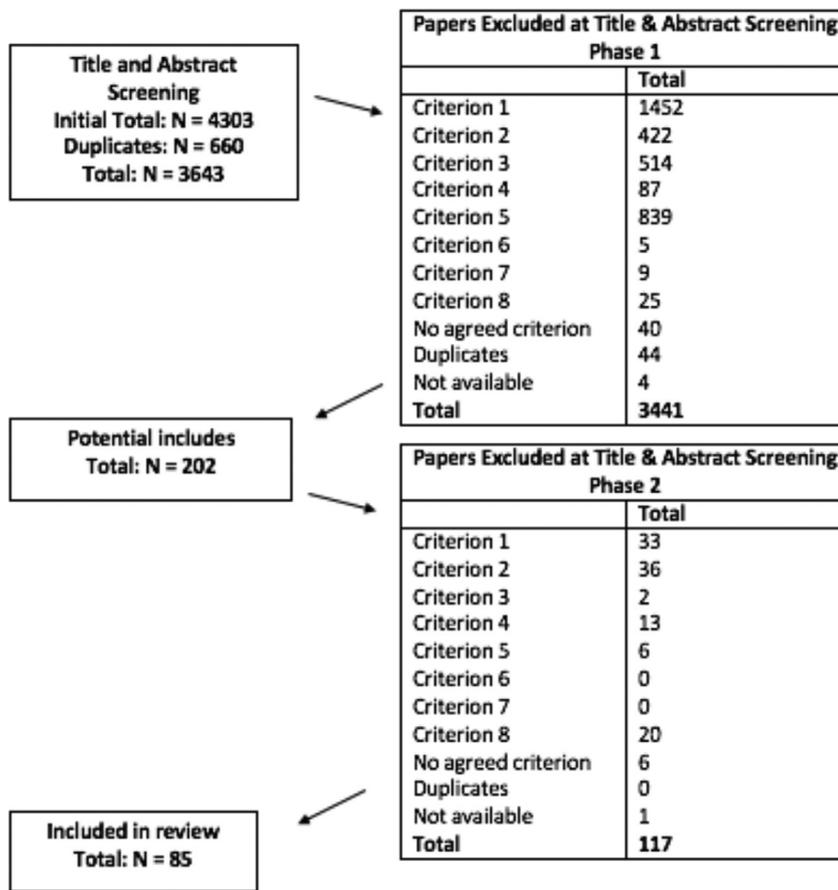


Fig. 1. Filtering of papers from initial searching to in-depth review.

Table 4
Identified types of study (N = 85).

Identified type of study	N=
Quantitative Studies	34
Qualitative Studies	24
Quant/Qual Studies	6
Overview/Other	8
Lit Reviews	13

tions and opportunities in employment and education (e.g. Elder, 1965; Harris & Rose, 2013). However, despite the vast majority of the 3643 papers being quantitative studies, such studies only made up about half of the selected sample (see Table 4). The relatively large number of qualitative studies probably reflected our focus upon lives and identities of individuals, families or communities within our inclusion/exclusion criteria. There was a clear paucity of personal narrative however and in the few studies which focused upon capturing personal testimony the most frequently used approach was interview. There were only four studies using a life history approach (see Table 5) and only three of these, with a focus upon the 11+, interviewed older participants (e.g. Brine, 2006; Barker, 2012).

There was relatively little consideration given to the longitudinal influences of selection according to a hierarchy of 'intelligence', with only 7 studies looking at lives beyond school. The significance of this lack was particularly evident when considering the wide number of 'variables' associated with classification across the studies; issues of class, ethnicity, disability and gender are all emphasised, with some degree of intersectionality evident in only 15 studies. Many other potential 'variables', such as sexuality, mental health, death and caring, were conspicuous by

their absence. The limiting tendency of this reductionist view was exacerbated further by the variety of forms that intelligence-based classification takes. It is possible that other classifications would have emerged if we had adopted more proxy terms in our search, but given the targeted nature of our first search terms it is evident that three broad strands of classification research are associated with notions of intelligence:

- entrance examinations/criteria/Standardised Assessment Tests (SATS)
- gifted and talented
- streaming/setting/tracking

However, no studies examined all three areas, with most concentrating upon a single selection mechanism (mainly entrance exam/criteria) (see Table 6).

3.1. Thematic Findings

Despite the limitations which arise from the relatively small number of studies focussing upon how intelligence-based classification shapes lives and identities and the wide number of 'variables' at play at any given moment within our relational experiences of education, a review of this kind, through synthesising a wide range of studies can begin to draw together a collective view of experiences. Seven overarching themes emerged (See Table 7).

3.1.1. Views of intelligence

Within some studies children, teachers, parents and researchers appear to accept and value 'selection' (Anderson, 1981; Chetcuti & Griffiths, 2002; Elwood, 2013; Kirkland, 1971; Whitwham, 2017) and to believe implicitly in the idea of 'intelligence'. However, there is also evidence of resistance to notions of 'intelligence' and its consequences

Table 5
Identified approach to narrative and emphasis of focus.

Identified approach to narrative	N=	Identified emphasis of focus	N=
Personal Testimony		Family Perspective	17
<i>Life Story/</i>	4	Community	5
<i>Autobiography/biography</i>	7	Perspective	30
<i>Interview & creative methods</i>	17	Social Class	16
Longitudinal (not life story - same individual twice or more)	3	Emphasis	10
<i>In school</i>	7	Ethnicity Emphasis	14
<i>At school leaving age</i>	5	Disability	15
<i>School and beyond</i>	2	Emphasis (4)	(6)
Retrospective (not life story)	1	Gender Emphasis	(2)
<i>Quantitative</i>		Mixed Emphasis	(1)
Other		Class & Ethnicity	(1)
<i>Documentary/archival</i>		Class & Gender	(1)
<i>Experimental</i>		Gender & Ethnicity	(1)
		Disability & Ethnicity	
		Class, Gender & Ethnicity	
		Disability, Gender & Class	

Table 6
Focus of research evident in Systematic Literature Review (N = 85).

Study focus	One selection mechanism	Study focus	Two selection mechanisms
Entrance Exam/Criteria: (11+ =33) (IQ/SATS = 22)	55 (4 life histories)	11+ and Streaming/tracking	3
Gifted & Talented	7	IQ/SATs and Streaming/tracking	8
Streaming/tracking	6	IQ/SATs and Gifted & Talented	5
Total	68	IQ/SATs and 11+	1
		Total	17

Table 7
Over-arching themes emerging from the literature in relation to intelligence-based classification and selection.

<ul style="list-style-type: none"> • Impacts significantly on educational and employment aspirations, opportunities and performance • Impacts significantly on educational & personal confidence, psychology and behaviour • Reflects, shapes, perpetuates and strengthens core identities of self, family and community <ul style="list-style-type: none"> ○ Social class, ethnic and gender hierarchies, identities and divisions ○ Other individual and collective identities • Impacts significantly on the quality of pedagogy and curricula • Has mixed impact on the lives of disabled people • Reflects uncritical discourses relating to 'intelligence' and 'good' education • Provokes resistance and agency in the face of its negative impact

from schoolchildren and teachers alike. Within the studies, people challenge ideas of selection as defining 'ability' (Chetcuti & Griffiths, 2002; Goslin & Glass, 1967; Straková, Greger, & Soukup, 2016), resist the stigma of 'failure' (Barker, 2012; Black, 2013; Chetcuti & Griffiths, 2002; Korp, 2011; Mayes & Moore III, 2016; Vang, 2006) and turn negative early experiences to positive effect when an adult (Ward, 2008). This can include overcoming additional barriers to access a range of educational and employment opportunities (Barker, 2012; Black, 2013; Dicketts & Landman, 2011; Korp, 2011) or resisting how selection undermines their own educational opportunities (Altshuler & Schmautz, 2006;

Korp, 2011), including through exercising agency in the face of the stressful testing (Leonard, 2006). Views about 'intelligence' can be seen to be linked to positive/negative views of self (Chetcuti & Griffiths, 2002; Goslin & Glass, 1967; Hajar, 2018; Kirkland, 1971; Lucey & Reay, 2002; Smardon, 2008), with children having different views on its nature depending upon their position in a hierarchy of educational achievement (Kirkland, 1971; Matheson, 2015; Skipper & Douglas, 2016), with some believing that hard work is the key criteria to success (Straková et al., 2016).

3.1.2. Sense of self

Within the literature there is a clear support for the idea that intelligence-based classification and selection can have a critical psychological, emotional and behavioural impact on children. The process of testing associated with selection can engender significant levels of stress and/or anxiety and/or poor mental health. (Anderson, 1981; Bowyer, 1961; Carlin, 2003; De Lisle & McMillan-Solomon, 2017; Hajar, 2018; Harlen, 2003; Kirkland, 1971; Leonard, 2006; Lucey & Reay, 2002; Montague, 1959; Ritzema & Shaw, 2012; Sarnoff, Sarason, Lighthall, & Davidson, 1959; Whitwham, 2017). More broadly classification and selection can have a negative impact upon self-esteem (Carlin, 2003; Dicketts & Landman, 2011; Elder, 1965; Goslin & Glass, 1967; Harlen, 2003; Ireson & Hallam, 1999; Leonard, 2006; Peltier, 1991; Skipper & Douglas, 2016; Whitwham, 2017; Yarker & Benn, 2011) or emotions and behaviour (Ingram, 2009; Ireson & Hallam, 1999; Spruyt, Van Droogenbroec & Kavadias, 2015) and a negative impact upon how confident children feel about their own 'intelligence' or 'ability' (Altshuler & Schmautz, 2006; Chetcuti & Griffiths, 2002; Harlen, 2003; Korp, 2011; Makel, 2009; Miller et al, 2001; Peltier, 1991; Skipper & Douglas, 2016), even if successfully selected (Chetcuti &

Griffiths, 2002; Preckeland & Brüll, 2008; Ritzema & Shaw, 2012). There is also evidence, though less of it, that selection can have a positive impact on self-esteem (De Lisle & McMillan-Solomon, 2017; Hajar, 2018; Skipper & Douglas, 2016; Zeidner & Schleyer, 1999a) or emotions and behaviour (van der Meulen, van der Bruggen, Spilt, Verouden, Berkhout & Bögels, 2014; Peltier, 1991), and how confident children feel about their own 'intelligence' or 'ability' (Ahmavaara, & Houston, 2007; Lucey & Reay, 2002; Skipper & Douglas, 2016; Straková, Greger, & Soukup, 2016; Sung, Huang, Tseng & Chang, 2014). There are psychological impacts resulting from being identified as 'gifted' too. Children identified as 'gifted' can thrive psychologically in mixed 'ability' streams (van der Meulen et al, 2014; Straková et al, 2016; Sung et al, 2014; Zeidner & Schleyer, 1999a&b), whilst some find streaming psychologically positive (Eddles-Hirsch, Vialle, McCormick, & Rogers, 2012; Lee, Olszewski-Kubilius, Makel & Putallaz, 2015; Peltier, 1991; Zeidner & Schleyer, 1999b) and others problematic (Eddles-Hirsch et al, 2012; Preckel, Gotz & Frenzel, 2010; Preckeland & Brüll, 2008; Zeidner & Schleyer, 1999b). Several studies suggest that children's intellectual self-identities are shaped by the social class nature of selection (Abramson, 1967; Bakker & Amsing, 2012; Korp, 2011; Lucy & Reay, 2002; Spruyt, Van Droogenbroec & Kavadias, 2015) and that their identification/relationship with their school and society may be determined by these experiences (Abramson, 1967; Elwood, 2013; Godor & Szymanski, 2017; Ireson & Hallam, 1999). Others factors are also shown to influence self-identity (Chetcuti & Griffiths, 2002; Goslin & Glass, 1967; Kirkland, 1971; Möller, Zimmermann & Köller, 2014) and that social class itself can be seen as the key determinant of educational and employment trajectory (Abramson, 1967; Cave, 1967; Ferrer-Wreder, Wänström & Corovic, 2014; Heath, 1984).

3.1.3. Social relations

There is considerable evidence that intelligence-based classification and selection reflects, perpetuates and strengthens social class, ethnic and gender hierarchies, identities and divisions (Kirkland, 1971; Montague, 1959; Whitwham, 2017). Parents invest financially and emotionally in selective education, seeing it as integral to middle class identity/status (Abramson, 1967; Bowyer, 1961; Carlin, 2003; Chetcuti & Griffiths, 2002; Hajar, 2018; Kirkland, 1971; Lucy & Reay, 2002; Whitwham, 2017). However, it is seen as denying working class children educational opportunities by IQ classification/selective education (Bakker & Amsing, 2012; Barker, 2012; Black, 2013; Carlin, 2003; Dean, 2016; Dicketts & Landman, 2011; Elder Jr, 1965; Harris & Rose, 2013; Husen, 1960; Ingram, 2009; Morris & Perry, 2017) and challenging their identities and relationships (Abramson, 1967; Brine, 2006; Ingram, 2009; Whitwham, 2017), and poor academic/self-concept and self-esteem (Altshuler & Schmautz, 2006; Armour-Thomas, 1992; Mayes & Moore III, 2016). Overall the system encourages knowing one's 'place in society', (Abbas, 2007; Brine, 2006) through visible and linguistic signifiers (Abbas, 2007; Bakker & Amsing, 2012; Black, 2013; Brine, 2006; Carlin, 2003; Korp, 2011). The divisive and hierarchical process encourages the creation of identities against 'each other' (Chetcuti & Griffiths, 2002; Ingram, 2009; Peltier, 1991; Skipper & Douglas, 2016), resulting in strong negative self-identities (Black, 2013; Chetcuti & Griffiths, 2002; Dicketts & Landman, 2011; Korp, 2011; Peltier, 1991; Skipper & Douglas, 2016; Spruyt, Van Droogenbroec & Kavadias, 2015; Whitwham, 2017; Yarker & Benn, 2011) and positive self-identities (Eddles-Hirsch et al, 2012; Makel, 2009; Skipper & Douglas, 2016; Zeidner & Schleyer, 1999a). It means that schoolchildren identified as gifted may experience social rejection and/or isolation (Eddles-Hirsch et al, 2012; Leonard, 2006; Zeidner & Schleyer, 1999b) much as other students do Godor & Szymanski, 2017 and that both rural or urban identities and attachments can be affected (Howley, Rhodes, & Beall, 2009; Montague, 1959). The degree to which selection impacts upon the lives of disabled people is less clear (Hall, Strydom, Richards, Hardy, Bernal & Wadsworth, 2005; Keogh, Bernheimer & Guthrie, 2004; Myers & Brown, 2005) with some suggestion that it can have a posi-

tive impact (Dale, 2007; Freeman, 2000), but slightly more that it can have a negative impact (Barow, 2011; Higgins, Raskin, Goldberg & Herman, 2002; Keogh et al, 2004; Lackaye, Margalit, Ziv & Ziman, 2006; Ward, 2008), requiring resistance on behalf of the children and parents (Ward, 2008).

3.1.4. Life chances

It is evident that children who enter a selective school and/or stream frequently experience a flawed and biased process that unfairly shapes their lives (Carlin, 2003; Goslin & Glass, 1967; Guyon, Maurin & McNally, 2012; Hajar, 2018; Harris & Rose, 2013; Mayes & Moore III, 2016; Miller et al, 2001). Children's educational aspirations, opportunities and/or performance may be critically determined by intelligence-based classification and selection (Ahmavaara & Houston, 2007; Chetcuti & Griffiths, 2002; Dorling & Tomlinson, 2016; Ferrer-Wreder et al, 2014; Harris & Rose, 2013; Johnston & Wild, 2018; Kerckhoff, 1975; Kirkland, 1971; Morris & Perry, 2017). These may be positively impacted (Ahmavaara & Houston, 2007; Anderson, 1981; Dean, 2016; Harris & Rose, 2013; Heath, 1984; Kerckhoff, 1975; Morris & Perry, 2017), including for working class children (Barker, 2012; King, 1959, 1960) by being placed in an 'upper' stream/track (Johnston & Wild, 2018; van der Meulen et al, 2014; Preckel et al, 2010) or a 'lower' stream/track (Preckel et al, 2010), though the positive effect can be slight, or evidenced from the perspective of the teacher or through secondary data. These educational aspirations, opportunities and/or performance can also be negatively impacted (Ahmavaara & Houston, 2007; Barker, 2012; Black, 2013; Dicketts & Landman, 2011; Elder Jr, 1965; Harris & Rose, 2013; Heath, 1984; Ingram, 2009; Kerckhoff, 1975; Levacic & Marsh, 2007), perhaps by underachieving on high stakes tests (other than 11+) (Altshuler & Schmautz, 2006; Armour-Thomas, 1992; Gillborn, 2010; Ingram, 2009; Sardon, 2008) or by being placed in a 'lower' or non-academic stream/track (Black, 2013; Cammarota, 2006; Ireson & Hallam, 1999; Jimerson, 2001; Johnston & Wild, 2018; Korp, 2011; Lavrijsen & Nicaise, 2016; Peltier, 1991; Ward, 2008) or by being 'retained' (Keogh et al, 2004). The quality of their primary school education can also be negatively impacted by preparation for a test, both through inclusion (Carlin, 2003; De Lisle & McMillan-Solomon, 2017; Elwood, 2013; Ingram, 2009; Leonard, 2006; Montague, 1959) and exclusion from this test preparation (Bakker & Amsing, 2012; Ingram, 2009), though some may benefit from the preparation (Hajar, 2018; Kirkland, 1971). The impact upon long term & employment aspirations and opportunities is also contested with claims that it can serve to enhance or disadvantage (Abramson, 1967; Anderson, 1981; Black, 2013; Chetcuti & Griffiths, 2002; Dean, 2016; Elder Jr, 1965; Ferrer-Wreder et al, 2014; Ireson & Hallam, 1999; Jimerson, 2001; Kirkland, 1971; Knight, 2000; Montague, 1959; Whitwham, 2017) or not have an influence (Ferrer-Wreder et al, 2014; Heath, 1984; Ireson & Hallam, 1999; King, 1959; Lavrijsen & Nicaise, 2016; van der Meulen et al, 2014; Morris & Perry, 2017; Taylor, 1960).

3.1.5. Educational practice

Across the literature it is evident that children who enter a selective school and/or stream frequently experience it as a problematic educational experience (Barker, 2012; Carlin, 2003; Hoskins & Smedley, 2016; Ingram, 2009; Mayes & Moore III, 2016), resulting in a negative educational experience for minority ethnic pupils (Allen, 2012; Altshuler & Schmautz, 2006; Anderson, 1981; Armour-Thomas, 1992; Cammarota, 2006; Dicketts & Landman, 2011; Kirkland, 1971; Korp, 2011; Mayes & Moore III, 2016; Peltier, 1991; Vang, 2006). Girls too are seen to be denied educational opportunities (Barker, 2012; Korp, 2011) and to be more vulnerable to systemic inequities (Ahmavaara & Houston, 2007; Ferrer-Wreder et al, 2014; Harlen, 2003; Korp, 2011). Selection processes impacts significantly on the quality of pedagogy and curriculum. There are a few voices in the literature who suggest that the additional support provided by such a

system is key to a positive educational experience (Lazar & Darlington, 1982), however, more commonly it is noted that children in the non-selecting schools or 'lower' or 'non-academic' streams will experience low expectations and negative assumptions in relation to teaching attitudes and curricula (Ahmavaara & Houston, 2007; Barker, 2012; Black, 2013; Cammarota, 2006; Ireson & Hallam, 1999; Johnston & Wild, 2018; Korp, 2011; Ladd & Linderholm, 2008; Peltier, 1991; Vang, 2006), whilst children in selective schools or 'higher' streams are more likely to experience positive teaching attitudes, practices and curricula (Johnston & Wild, 2018; Lee et al, 2015; van der Meulen et al, 2014).

4. Discussion and Conclusion

In studies that look across countries, contexts and issues (eg Blossfeld et al, 2016) it is possible to suggest some patterns which may be applied to educational selection generally. Similarly, by looking across literature which considers educational selection according to levels of 'intelligence' it is possible to make some broad statements, in particular that it:

- Impacts on the lives, identities and relationships of individuals, families and communities across the lifespan and within and between generations.
- Creates and perpetuates hierarchies and divisions according to ethnicity, social class, gender and disability.
- Has a fundamental influence on individual and community educational experiences.
- Overall, is a conflicted experience but is understood to have more negative effects than positive.

The literature provides a sense of a complex weave of challenges created by selection according to notions of intelligence and subsequently experienced by people throughout their lives. However, there would appear to be some critical dimensions which are either absent or underplayed within the literature. In particular:

- Studies which synthesis experiences across different modes of classification
- Qualitative longitudinal approaches, especially life histories, which explore the possible longer-term life course impact
- The lived experience of family and community relationships
- The voice of the research subject

As a consequence, the very mundanity of these challenges and their divisive role in our everyday lives is largely unexplored and unquestioned. The wider literature, for instance, highlights the ways in which children are ascribed formal and informal labels as a result of educational selection e.g. 'thick', 'stupid', 'clever', 'gifted', 'able', 'manual' and 'intellectual'. However, how these identifiers, along with opportunities for qualifications, play out in the nuanced lived experience and meanings of individual lives, is critically under-researched.

Within this review, there were a small number of powerful studies, often based upon personal testimony, which evidence how dividing children according to 'intelligence' creates opportunities for some but also perpetuates social class, ethnic, gender and disability identities, hierarchies and divisions (e.g. Abbas, 2007; Ingram, 2009). Often underpinning these studies was a discourse of social cohesion rather than of social mobility. Pinpointed in the research, for instance, were poignant references to the tensions experienced by children, and their parents, as they navigate the social, ethnic and cultural challenges deriving from selective educational practices. However, the literature lacks detail about the dynamics within families, between and within generations, and communities. These dimensions often only being mentioned in passing or left to anecdotal stories. There were 17 other studies in which the voices of the participants were central. However, with the odd exception (e.g. Eddles-Hirsch et al, 2012), these pieces of research focussed on entrance exams and only captured the young people's experiences of school. They

also occupied a relatively minor place in the overall research literature dealing with educational selection and lack a wider life-long perspective, rarely including testimonies of parents, teachers and other family and community members.

Since Jackson and Marsden carried out their seminal UK study on working class children and grammar school education in the 1950s and 60s, we could find no major study taking a life history approach to educational selection (Jackson & Marsden, 1966). This paucity and the gap it creates is highlighted by the four studies using a life history approach. These hinted at the richness of insight possible using life histories, placing the subjective and reflective experience of participants central in the sense making of their lives. For example, within Barker (2012), it is evident how a working-class boy who failed an entrance exam gained confidence from doing well in a less-academic setting, but found the nature of the curriculum did not meet his interests and needs, denying him access to future education and employment opportunities that would have interested him and constraining his ways of working throughout his adult life. It is also clear how a working-class girl who passed an entrance exam felt comfortable intellectually and socially in the setting but was constrained by curriculum structures and the gendered assumptions, and 'shunted' into a career as a teacher. Similar richness, that points towards the complexity of people's experiences is evident in Brine (2006), which explores how four women came to understand how they had been educated for their own classed and gendered place in society, relative to others and how their identities were constructed in relation to children in other settings. As a consequence, their sense of class remained strong and/or problematic beyond school so that a 'transitional class position' created an emotional and fragile sense of self. Cammarota (2006) brings similar depth to his exploration of the Latino/a students' experiences, exploring how racist presumptions of intelligence are supported by tracking, by being taught down-to, stuck in tracks and by a need to demonstrate ability to gain teachers attention. Such summaries only hint at the nuanced nature of these studies, but they highlight the need to capture the voices of people who have experienced educational selection in relation to notions of intelligence, in all its various forms and contexts.

The absence of voice and instead a focus upon types of educational selection in isolation or in relation to specific variables means that the complex interplay of peoples' experiences in the context of the knowledge hierarchy's diverse forms is largely missing. As a result we are potentially limited in understanding the impact of the knowledge hierarchy on the lives and identities of individuals, families and communities and its capacity to reproduce or disrupt marginalisation and social inequalities.

4.1. Conclusion

This systematic search and examination of the literature associated with educational selection according to notions of intelligence highlights both the significant impact it has upon people's lives throughout their lives and the lack of research which explores this impact. The conception of knowing, of 'intelligence', is not universally shared, but has a long history of contestation, however any meaningful challenge to its dominance within our current education system requires a robust research base, one which reflects the lived experiences of those who have been through that system. This review highlights the tendency of research to separate these processes and mechanisms of selection from each other, so reducing our chances of learn overall lessons about practices rooted within and dependent upon our understandings of intelligence.

Within this study, it was noticeable that there was little debate about the nature of our understandings of intelligence and its socio-cultural-historical (and perhaps biological) construction. There was instead a strong thread indicating an uncritical acceptance of its existence. This may be a consequence of our search times and inclusion/exclusion criteria but it still suggests a lack of critical engagement with what might be at the core of people's experiences of selection. This requires deeper

consideration. The unquestioned belief in and value placed upon notions of intelligence would seem to be at the heart of how it influences people's sense of self and their social relations and consequently the life chances and educational practices they experience.

If we wish to better understand how our underlying values around intelligence permeate people's lived experiences there is a research gap to be filled. This involves seeking out the voices of current students, but it also requires us to explore the narratives of people across ages and across contexts. It requires us to better understand the impact of selection according to notions of intelligence (regardless of the form it takes) upon people's personal, social and cultural lives and relationships, and in the process it requires us to better understand the influence of the notion of intelligence itself.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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