Self-concept in poor readers: a systematic review protocol

Individuals with poor reading ability are at greater risk of educational and occupational difficulties. In addition to this, these individuals are also at greater risk of poor health outcomes, particularly mental health. At least some of this association may be underpinned by poor self-concept; however, the evidence for this relationship is mixed. In this systematic review protocol, we outline an approach to adjudicate between three reasons for these mixed results: (1) poor reading is more closely associated with some types of self-concept than others; (2) low self-concept is more closely associated with some types of poor reading than others; and (3) low self-concept is not associated with poor reading per se, but is associated with co-morbid problems with language or attention. The protocol proposes a review (based on PRSIMA-P guidelines) to use the existing literature to explore the evidence for these possibilities to better understand the association between poor reading and low self-concept.

ADMINISTRATIVE INFORMATION

Title:

Self-concept in poor readers: a systematic review protocol

Registration

This protocol has not been registered but is available as a PeerJ Preprint

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Contributions

GM is guarantor. NAB organised the outline, initial draft, and the final protocol. GM, DF, NC, and MEB provided comments and feedback on the draft protocol. GM wrote the Introduction and all authors provided input and feedback.

Amendments

This is the original protocol for this systematic review, created in 2016 based on the PRISMA-P 2015 checklist (Moher et al., 2015; Shamseer et al., 2015). In the event of amendments to the protocol, the date and description of each amendment will be provided along with an update to the review rationale as necessary.

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ABSTRACT

Individuals with poor reading ability are at greater risk of educational and occupational difficulties. In addition to this, these individuals are also at greater risk of poor health outcomes, particularly mental health. At least some of this association may be underpinned by poor self-concept; however, the evidence for this relationship is mixed. In this systematic review protocol, we outline an approach to adjudicate between three reasons for these mixed results: (1) poor reading is more closely associated with some types of self-concept than others; (2) low self-concept is more closely associated with some types of poor reading than others; and (3) low self-concept is not associated with poor reading per se, but is associated with co-morbid problems with language or attention. The protocol proposes a review (based on PRSIMA-P guidelines) to use the existing literature to explore the evidence for these possibilities to better understand the association between poor reading and low self-concept.

INTRODUCTION

Rationale

Sixteen percent of children have reading skills that fall below the average range for their age or grade, and 5 percent of children have significant and severe reading difficulties (Ramus, 2001). Some children are poor readers because they have not received appropriate reading instruction, while others fail to learn to read despite proper instruction (i.e., children with developmental dyslexia).

Regardless of origin, we have known for quite some time that poor reading puts children at higher risk for academic failure (Herbers et al., 2012; Prior, Sanson, Smart, & Oberklaid, 2000). However, it is only in the last decade or so that we have started to study the association between poor reading and emotional health. In this review, we focus on the potential relationship between poor reading and self-concept, which we define as: "A person's perceptions of him- or herself. These perceptions are formed through experience with and perceptions of one's environment. They are influenced by evaluations by significant others, reinforcements, and attributions for

one's own behaviour" (p. 107; Marsh & Shavelson, 1985).

Numerous studies have tested self-concept in poor readers. The outcomes have been mixed: While some studies have found low self-concept in poor readers (e.g., Alexander-Passe, 2006; Chapman & Tunmer, 1997; Fairhurst & Pumfrey, 1992), others have not (Tam & Hawkins, 2012; Taylor, Hume, & Welsh, 2010). Why might this be the case? One possible explanation relates to how self-concept is defined. Historically, not all researchers have defined self-concept in the same way, and some researchers use the terms self-concept interchangeably with self-esteem, self-worth, self-image and self-perception (Zeleke, 2004). Other researchers have distinguished between these terms, but not necessarily in the same way. For example, some have used the term self-concept to represent a descriptive component of self-perception (e.g., I am not good at reading), while others perceive self-concept to be evaluative as well as descriptive (e.g., I am poor at reading; Marsh & O'Mara, 2008). There are also different opinions on whether self-concept comprises a single or multiple domains (Zeleke, 2004), and what those domains might be. For example, Marsh's model (Marsh, 1992; Marsh & Hattie, 1996) proposes that self-concept comprises academic, social, personal/emotional, and physical domains, while Harter's (1985) model comprises a global domain as well as scholastic competence, social acceptance, physical appearance, and behavioural conduct. Fortunately, Marsh and O'Mara (Marsh & O'Mara, 2008) and Zeleke (2004) have noted a growing consensus amongst researchers that self-concept refers to a person's perceptions of themself in specific domains. This contrasts with self-esteem, which refers to "one's global sense of wellbeing as a person" (p. 148; Zeleke, 2004).

Around two-dozen studies have tested poor readers for their self-concept in various domains. Of these domains, poor reading appears to be most reliably associated with self-concept in the academic domain (e.g., Alexander-Passe, 2006; Frederickson & Jacobs, 2001; Humphrey & Mullins, 2002; Snowling, Muter, & Carroll, 2007; Terras, Thompson, & Minnis, 2009). This is supported by a review done by Zeleke in 2004, which reported that studies testing academic self-concept in people with learning disabilities (including poor readers) were more likely to find evidence for low self-concept than studies that tested general or global self-esteem. However, one cannot ignore evidence that poor readers also have low social self-concept (e.g., Martínez & Semrud-Clikeman, 2004), athletic self-concept (e.g., Boetsch, Green, & Pennington, 1996), physical self-concept (e.g., Humphrey & Mullins, 2002), behavioural self-concept (e.g., Frederickson & Jacobs, 2001), parental self-concept (Westervelt, Johnson, Westervelt, & Murrill, 1998), and practical self-concept (Polychroni, Koukoura, & Anagnostou, 2006). This evidence – which links poor reading to various types of low self-concept – raises the possibility that there is mixed evidence for an association between poor reading and low self-concept because different studies have measured different types of self-concept in poor readers, and some types are more closely related to reading than others.

A second potential explanation for the mixed evidence for an association between poor reading and low self-concept relates to the heterogeneous nature of reading problems. Children with poor reading can have different patterns of strengths and weaknesses in their reading accuracy, fluency, and comprehension. For example, some poor readers have difficulty reading words via phonological decoding (i.e., the ability to use letter-sound rules to read new words), some poor readers have problems

reading whole words via sight (especially important for reading irregular words like YACHT); and some poor readers have problems with both phonological decoding and sight word reading (Castles & Coltheart, 1993; McArthur et al., 2013; Peterson, Pennington, & Olson, 2013; Ziegler et al., 2008). In contrast, some children have no problems with phonological decoding or sight word reading, but struggle to understand the meaning of texts ("poor comprehenders"; Nation, Cocksey, Taylor, & Bishop, 2010). The existence of different types of reading difficulty raises the possibility that some reading problems are more closely associated with low self-concept than others.

A third possible explanation for the mixed evidence for an association between poor reading and low self-concept is that poor reading is not related to low self-concept per se. Instead, it may be that "co-morbid" impairments of both poor reading and low self-concept create an illusory association between poor reading and low self-concept. For example, there is evidence that 50% of poor readers have spoken language impairments (Eisenmajer, Ross, & Pratt, 2005; McArthur, Hogben, Edwards, Heath, & Mengler, 2000), as well as evidence that poor spoken language is associated with anxiety, depression, social withdrawal, and low self-concept (Carroll & Iles, 2006; Lindsay & Dockrell, 2000). Similarly, studies have reported that 30-70% of children with poor reading have concomitant problems with attention and hyperactivity, and that attention or hyperactivity are associated with anxiety, depression, and low self-concept (Maughan & Carroll, 2006; Treuting & Hinshaw, 2001). Considered together, these findings raise the possibility that low self-concept in poor readers may actually relate to their poor language or poor attention rather than their poor reading per se.

Objectives

In sum, there are at least three reasons why previous studies have found mixed evidence for an association between poor reading and low self-concept: (1) poor reading is more closely associated with some types of self-concept than others; (2) low self-concept is more closely associated with some types of poor reading than others; and (3) low self-concept is not associated with poor reading per se, but is associated with co-morbid problems with language or attention. The aim of the review was to use the existing literature to explore the evidence for these possibilities to better understand the association between poor reading and low self-concept.

METHODS

Eligibility criteria

Studies will be selected according to the following criteria:

Participants and reading ability

We will include studies in which poor reading is defined as reading accuracy, reading fluency, or reading comprehension one or more standard deviations below the mean on a standardized assessments or relative to an age-matched group of typical readers..

Measures of self-concept

We will include studies in which self-concept is measured using normed indices of self-concept administered directly to poor readers. It will not consider indirect indices administered to significant others such as teachers, parents, or careers.

Analysis

We will include studies that report quantitative analyses of results.

Information sources

The literature search strategy will be conducted with the below mentioned terms with the goal of capturing self-concept research conducted with poor readers. We will search PsycInfo (Ovid,1860 to 2016), MEDLINE (Ovid, 1902 to 2016), and EMBASE (Ovid, 1902 to 2016), WILEY, and PubMed for all available years. The literature search will be limited to the English language and human participants.

In addition, we will scan the reference list and forward citations (using https://scholar.google.com.au/) of included studies and reviews for relevant work missed by the formal searches. In order to include unpublished or non-indexed work, we will also search grey literature through the following search tools:
- http://www.opendoar.org/
- http://www.opengrey.eu/
- http://www.base-search.net/
- http://trove.nla.gov.au/
- http://www.phcris.org.au/roar/
- http://www.worldcat.org/
- http://research.allacademic.com/

Search strategy

The search strategy will include the following terms:

Poor reading

- dyslexia
- poor reading
- reading disability or difficulty or disorder or impairment or deficit or delay
- learning disability or difficulty or disorder or impairment or deficit or delay

Self-concept

- self concept
- self esteem

An example PsycInfo search:

1. (dyslexi* or (poor adj1 read*) or ((read* or learn*) adj1 (dis* or diff* or impair* or def* or delay))) or (word blind*))
2. (self and (concept or esteem or confidence))
3. 1 & 2
4. Limit to English Language and Human

STUDY RECORDS

Data management

The literature review search results will be maintained on an internal server hosted by The Department of Cognitive Science at Macquarie University and on The Open Science Framework (OSF). All Macquarie University members of the team will have access to the server. NAB will be primarily responsible for maintaining the database and maintaining an up-to-date copy on OSF.

Selection process

At least two authors will independently screen the titles and abstracts of work identified by the search against the inclusion criteria. Where there is ambiguity regarding the inclusion of a selected work, the full text will be screened to determine eligibility. Where ambiguity remains, we will seek clarification from the authors of the work. Discrepancies will be discussed between two or more authors. The rationale for excluded works will be recorded. The authors will be blind to the journal titles, study authors and institutions during the screening process but this will not be the case for ambiguous works for which the full text will be screened.

Data collection process

The data will be extracted from each of the works that pass the screening phase and will be entered into a form. The data will include demographic information, reading and self-concept assessments and outcomes, and the reading-self-concept relationship analysis and statistics. This process will be tested in a round-table meeting of all authors in order to refine the extraction for a small set of works. Following this, two authors will independently extract the data for each work. In the case of discrepancies, a third author will independently extract the data. Three or more authors will decide upon further discrepancies.

Data items

We will extract the information displayed in Table 1.

Table 1

Category, name, and description of data items that will be extracted from works.

Category	Name	Description
Group Descriptives		
	Criteria	Criteria used to define poor readers and control groups
	N	Sample size

Category	Name	Description
	Age/Grade	Age and/or grade of groups (central tendency, variation, and range)
	Sex (F/M)	Number of females and males in groups
	IQ	Intelligence Quotient scores (if available)
Reading		
	Tests	Tests used
	Impaired	Means (M), standard deviations (SD), and effect sizes (ES) on tests showing impaired mean scores in poor readers
	Spared	M, SD, and ES on tests showing unimpaired mean scores in poor readers
Self-concept		
	Tests	Tests used
	Impaired	Means (M), standard deviations (SD), and effect sizes (ES) on tests showing impaired mean scores in poor readers
	Spared	M, SD, and ES on tests showing unimpaired mean scores in poor readers
Language		
	Tests	Tests used
	Impaired	Means (M), standard deviations (SD), and effect sizes (ES) on tests showing impaired mean scores in poor readers
	Spared	M, SD, and ES on tests showing unimpaired mean scores in poor readers
Attention		
	Tests	Tests used
	Impaired	Means (M), standard deviations (SD), and effect sizes (ES) on tests showing impaired mean scores in poor readers
	Spared	M, SD, and ES on tests showing unimpaired mean scores in poor readers
Theory		
	Quotes	A list of quotes pertaining to the rationale, theoretical motivation, and hypotheses of the work.

Outcomes and prioritization

The primary outcome will be whether the poor reading group has impaired self-concept relative to standardized test norms or a typically reading control group. In conjunction with this, we will identify which aspect of self-concept is impaired. The data will be based upon group summaries (i.e., not the number of individuals who are impaired). In addition, we will extract the rationale and theoretical motivation for the work.

Risk of bias (or 'quality') in individual studies

To assess the risk of bias for each study, we will use an adapted version of the Cambridge Quality Checklist (Murray, Farrington, & Eisner, 2009), presented in Appendix 1. This will award each work with a maximum of 29 points in relation to the following constructs: Facility sampling (0 to 3), Within-facility sampling of participants (0 to 3), Response rates (0 to 2), Sample size (0 or 1), Reading and Self-concept measure reliability and validity (0 to 3 each), Study design (1 to 3), and

Causal predictor (1 to 6). These ratings will be made by two independent authors and a third will be called upon to resolve discrepancies. The evidence will be evaluated based on three tiers of quality ratings: high (20 to 29 points), medium (10 to 19), and low (0 to 9). The greatest weight for conclusions will be based on the high quality papers, followed by medium, and low. If the conclusions are consistent between these tiers, then we will conclude the literature to be limited in terms of bias.

Data synthesis

We will provide a systematic narrative synthesis in text and key characteristics will be presented in tables. This synthesis will explore the nature of the relationship between poor reading and self-concept, specifically examining the component of self-concept most strongly associated with poor reading. If appropriate statistical information can be extracted from the works, we will conduct a meta-analysis to determine the strength of the relationship (i.e., effect size) between poor reading and self-concept. This will be conducted using random-effects modeling with Metafor (Viechtbauer, 2010).

Meta-bias(es)

Given appropriate data, we will assess publication bias using a Funnel plot and Egger's test. The plot depicts whether the literature includes evidence for and against the relationship as a function of sample size and Egger's test estimates the likelihood of asymmetries of the funnel plot (Egger, Smith, Schneider, & Minder, 1997).

Confidence in cumulative evidence

If possible, the confidence in cumulative evidence will be assessed and reported based on The Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach (Guyatt, Oxman, Schünemann, Tugwell, & Knottnerus, 2011). Based on this approach, considering risk of bias, consistency, directness, precision, and publications bias, we will define the quality of evidence as:

- High = further research is very unlikely to change our confidence in the estimate of effect;
- moderate = further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate;
- low = further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate;
- very low = any estimate of effect is very uncertain.

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APPENDIX 1 ADAPTED CAMBRIDGE QUALITY CHECKLIST FOR QUALITY ASSESSMENT OF PRIMARY STUDIES

Facility sampling	
3	Total population or random sampling
2	Purposive sampling
1	Convenience sampling
0	Not reported
Within-facility sampling of participants	
3	Total population or random sampling
2	Purposive sampling
1	Convenience sampling
0	Not reported
Response rates	
2	Response[i] *or* retention[ii] rates ≥70% *or* differential attrition[iii] ≤10%
1	Response rate <70% *or* retention rate <70% *or* differential attrition >10%
0	Not reported
Sample size score	
1	Sample size ≥400
0	Sample size <400
Reading/Self-concept measure validity	
3	Use of a validated standardized scale with the same target population *OR* use of an adapted scale that had been validated with another target population
2	Validation of a newly developed instrument
1	Use of a non-validated measurement
0	Not reported
Reading/Self-concept measure reliability	
2	Reliability coefficient ≥.7
1	Reliability coefficient <.7
0	Not reported
Study design score	
3	Prospective cohort data used in analysis
2	Retrospective cohort data used in analysis
1	Cross-sectional data used in analysis
Causal predictor score	
6	Analysis with variation in the predictor and adequately balanced, with analysis of change
5	Analysis with variation in the predictor and adequately balanced, no analysis of change
4	Analysis with variation in the predictor but inadequately balanced, with analysis of change
3	Analysis without variation in the predictor, with analysis of change
2	Analysis with variation in the predictor but inadequately balanced, no analysis of change
1	Analysis without variation in the predictor, no analysis of change