



A systematic review of reading interventions for secondary school students



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ABSTRACT

A systematic review of interventions designed to improve the reading skills of secondary school students summarised the evidence base regarding effectiveness. Studies conducted between 1999 and 2014 which used a randomised controlled design were included. Eight studies were categorised according to whether they targeted multiple component reading skills or reading comprehension skills only. Regarding the former, three of the four studies employed computer-aided instruction; the evidence base suggests that this method is not effective. In studies targeting reading comprehension skills only, the evidence indicates low effect sizes on reading comprehension outcomes when measured using standardised tests. Tutor led one-to one support in word recognition or decoding using an RCT design, and interventions which directly target student's language comprehension, are needed.

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1. Introduction

Poor reading ability is common in children and adolescents learning to read English. In 2014, the UK government reported that 22% of students did not have secure age appropriate reading skills on entering secondary school (Department for Education, 2014). In the U.S. in 2013, less than one third of grade 8 (14–15 year-old) students met the standard of reading "proficiently" for their grade level (National Assessment of Educational Progress; U.S. Department of Education, 2013). Many factors contribute to individual differences in adolescent reading ability. For example, there is a correlation between behavioural and emotional difficulties and reading ability in adolescents (Arnold et al., 2005), and a meta-analysis of studies investigating gender differences in reading achievement at the secondary school level suggests a gender gap in favour of girls (Lietz, 2006). Poor reading ability amongst adolescents has negative implications for psycho-social and educational development. A study by Daniel et al. (2006) showed that fifteen-year old adolescents with poor reading ability were more likely to experience suicidal ideas or attempts, and drop out of school than typical readers, suggesting that adolescents with poor reading ability can be labelled as being at social risk.

Reading is a fundamental skill in today's society, and key to acquiring information from printed material and electronic sources. To access the secondary school curriculum a high level of reading competency is necessary (Kamil, 2011). Texts used at this level include domain specific academic vocabulary (Bauman & Graves, 2010) and if students are unable to decode these words and access their meanings this will likely impede their ability to learn important new concepts through reading experience. Roberts, Torgesen, Boardman, and Scammacca (2008) suggest that struggling adolescent readers can be categorised as those having little or poor early reading instruction or those provided with good early reading instruction but

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who are subsequently unable to acquire reading skills. Attention therefore needs to be paid to improving early identification and intervention as well as understanding the reading profiles of older learners and how best to support their needs later in development.

The goal of reading is to understand text. Reading success is supported by word recognition and oral language comprehension skills. The Simple View of Reading (Gough & Tunmer, 1986) argues that for successful reading to occur both components need to be mastered. This model has been used to characterise different reading profiles and can be used as a starting point for making recommendations regarding effective intervention (Catts, Adlof & Weismer, 2006). The Construction-Integration (CI) model (Kintsch & Rawson, 2005) helps us to further examine the skills and processes necessary for reading. The CI model suggests that the reader forms mental representations of text. The first representation, the *textbase*, is constructed using information explicitly given in the text. The second representation, the *situation model*, is a richer personal interpretation created through integrating the textbase with prior knowledge. This theory therefore suggests that teaching and intervention designed to support reading needs to focus not only on decoding and understanding words and sentences but also on link making and the activation of students' life experiences and perspectives.

This systematic review focuses on how best to support adolescents' reading skills and the findings are summarised with reference to theoretical frameworks as appropriate. Our main aims were to provide researchers and practitioners with a concise, informative account of the current evidence base and to identify priorities for further intervention development, evaluation and research in this area.

The initial criterion for inclusion in this review was stringent; only evidence generated using a robust research design, the Randomised Controlled Trial (RCT) was included. An RCT involves groups being formed by random allocation of individuals, classes or schools (Torgerson, 2009). This method of allocation makes the RCT the only research method that can adequately control for all the unmeasured variables that may affect student outcomes (Brooks, Miles, Torgerson & Torgerson, 2006). That is, it ensures that potential confounding factors (e.g. school environment, classroom environment, classroom teacher, gender, socio-economic status) are distributed across groups. It is recommended that all RCTs follow the CONSORT statement (<http://www.consort-statement.org/>) to ensure consistency of reporting and rigorous safeguards against potential bias. In reality, reports of RCTs conducted in the field of Education do not always conform to all parts of the CONSORT guidelines (Torgerson, Torgerson, Birks & Porthouse, 2005). In order to ensure that our systematic review would return a sufficient number of results we decided not to use complete CONSORT reporting as a criterion. However where key details are provided by the authors, for example relating to experimenter blinding, they will be reported.

It is recognised that the decision to focus solely on RCTs in this review does not reflect the wide range of research designs used to assess the effectiveness of reading interventions for secondary school students. A rapid review of 43 studies published between 2001 and 2012 by See and Gorard (2014) provides a useful summary of catch-up literacy interventions for students in the transition to secondary school using a less stringent criteria to the present review. They highlight the Response to Intervention (RTI) approach as a promising intervention design and highlight the potential for more RCTs to be conducted in this field. The present systematic review therefore provides a timely and focused examination of the RCTs that have been carried out to date; this should serve as a useful platform on which future research can be developed.

Previous reviews of reading interventions for adolescent readers have included exclusionary criteria relating to reading outcome measures (e.g. Edmonds et al., 2009) and disability status of participants (e.g. Galuschka, Ise, Krick, & Schulte-Körne, 2014; Reed, Sorrells, Cole, & Takakawa, 2013; Wanzek et al., 2013). They have also included criteria relating to either the number of intervention sessions delivered (e.g. Wanzek et al., 2013), or to the type of instructional intervention (Solis et al., 2012). The parameters relating to measures, participants and intervention in the present review were kept deliberately wide in acknowledgement of the complexities involved in reading assessment, the heterogeneity of students reading profiles, and the multicomponential nature of reading instruction. Whilst we will not be controlling for these we will be reporting methodological details in full and highlighting any potential confounds and issues in the commentary of the review.

2. Research questions

1. How effective are reading interventions in improving reading outcomes for secondary school students aged 11–18 years?
2. What features of reading interventions are associated with improved outcomes for secondary school students aged 11–18 years?

3. Method

3.1. Search procedure

A database search of ScienceDirect, Scopus, Social Sciences Citation Index, ERIC, Australian Education Index, British Education Index, and PsycINFO to locate studies published between 1999 and 2014 was carried out.

The following search terms were used together (*reading intervention OR randomised controlled trial OR decoding OR comprehension OR decoding intervention OR comprehension intervention OR reading accuracy OR reading fluency OR dyslexia OR reading difficulty OR reading disability OR reading delay OR struggling reader*). The 'related terms' box was checked in each

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