Learning and Instruction 40 (2015) 54–60

Contents lists available at ScienceDirect

Learning and Instruction

journal homepage: www.elsevier.com/locate/learninstruc

Selfish learning: The impact of self-referential encoding on children's literacy attainment

David J. Turk [a, *], Karri Gillespie-Smith [b], Olave E. Krigolson [c], Catriona Havard [d], Martin A. Conway [e], Sheila J. Cunningham [f]

[a] University of Bristol, UK
[b] University of the West of Scotland, UK
[c] University of Victoria, Canada
[d] Open University, UK
[e] City University, UK
[f] University of Abertay Dundee, UK

ARTICLE INFO

Article history:
Received 23 June 2014
Received in revised form
4 August 2015
Accepted 7 August 2015
Available online 27 August 2015

Keywords:
Self
Memory
Literacy
Engagement
Attention

ABSTRACT

Self-referencing (i.e., thinking about oneself during encoding) can increase attention toward to-be-encoded material, and support memory for information in adults and children. The current inquiry tested an educational application of this 'self reference effect' (SRE) on memory. A self-referential modification of literacy tasks (vocabulary spelling) was tested in two experiments. In Experiment 1, seven-to nine-year-old children ($N = 47$) were asked to learn the spelling of four nonsense words by copying the vocabulary and generating sentences. Half of the children were asked to include themselves as a subject in each sentence. Results showed that children in this self-referent condition produced longer sentences and increased spelling accuracy by more than 20%, relative to those in an other-referent condition. Experiment 2 ($N = 32$) replicated this pattern in real-word learning. These findings demonstrate the significant potential advantages of utilizing self-referential encoding in the classroom.

1. Introduction

Psychological science plays an important role in teaching practice, with cognitive theory underpinning a variety of learning strategies (Pressley, Borkwski, & Schneider, 1989). For example, learners are more likely to retain information successfully when they are engaged with the learning materials and the information is richly encoded, so materials that promote these elements comprise valuable learning tools (Fredricks, Blumenfeld, & Paris, 2004; Sadoski, 2001). In line with this reasoning, the current report investigates the application of a robust memory phenomenon known as the self-reference effect (SRE – Rogers, Kuiper, & Kirker, 1977), assessing its usefulness in promoting children's literacy engagement and learning.

Standard cognitive accounts of memory processing such as dual-coding (Paivio, 1986) and levels of processing (Craik & Lockhart, 1972) suggest that rich encoding (e.g., that which promotes interconnectivity with current knowledge) is key to improving learning (for review see Sadoski, 2001). Consistent with this argument, Sadoski and colleagues demonstrated that both concreteness and familiarity are highly predictive of text learning, arguing that these features evoke rich verbal and non-verbal processing (Sadoski, Goetz, & Fritz, 1993; Sadoski, Goetz, & Rodriguez, 2000). Based on these findings, Sadoski (2001) suggests that educators include concrete, image-evoking features like personal hobbies and cartoon characters in children's learning materials to promote rich encoding. However, it is clear that teachers cannot reasonably be expected to create personally interesting materials for each child. A potential solution to this challenge it the use of a ubiquitous and highly reliable character with which to engage children and enhance learning: themselves.

1.1. The self and memory

Thinking about oneself while encoding information (known as

* Corresponding author. School of Experimental Psychology, University of Bristol, BS8 1TU, UK.
E-mail address: david.turk@bristol.ac.uk (D.J. Turk).

http://dx.doi.org/10.1016/j.learninstruc.2015.08.001
0959-4752/

'self-referencing') is well-established in the psychological literature as a method of increasing retention in memory (e.g., Conway & Dewhurst, 1995; Klein & Kihlstrom, 1986; Klein & Loftus, 1988; Rogers et al., 1977; Symons & Johnson, 1997; Turk, Cunningham, & Macrae, 2008). The memory advantage associated with self-referencing is known as the 'self-reference effect' (SRE). The SRE can be elicited through surprisingly simple self-item associations, for example by presenting to-be-remembered information simultaneously with the participant's own name or face (Turk et al., 2008), by assigning items to self through temporary ownership (Cunningham, Turk, MacDonald, & Macrae, 2008) or through self-choice (Cunningham, van den Bos, & Turk, 2011). Several studies have also demonstrated robust SREs in early and middle childhood (Cunningham, Brebner, Quinn, & Turk, 2014; Cunningham, Vergunst, Macrae, & Turk, 2013; Ross, Anderson, & Campbell, 2011; Sui & Zhu, 2005).

The features of self-referencing are notably consistent with Sadoski's (2001) recommendations for educational materials, namely familiarity and concreteness. Even in early childhood there is a highly developed sense of self that is frequently accessed and richly furnished with concrete knowledge (Lewis, 2003), as well as being self-evidently familiar. The self-concept has been argued to underlie the SRE, supporting the high levels of elaboration and organization associated with self-referential memories (Klein & Kihlstrom, 1986; Klein & Loftus, 1988; Symons & Johnson, 1997). The support of the self-knowledge framework in memory should therefore allow educational materials encoded in a self-referential context to be more successfully retained.

A second, highly valuable cognitive consequence of evoking the self at encoding is that it triggers mechanisms that could enhance task engagement. Specifically, cues of self-relevance such as one's own face or name provoke automatic shifts in attention and increased affective arousal, changes which both have a significant positive effect on memory (Turk et al., 2008; Turk, van Bussel, Brebner, Toma, Krigolson, & Handy, 2011). Engagement is a particularly important element of teaching practice, and indeed the erosion of interest and academic motivation as education progresses has been the source of a number of empirical studies (see Eccles, Wigfield, & Schiefele, 1998; Wigfield, Eccles, Schiefele, Roeser, & Davis-Kean, 2006).

It has been suggested that academic progress is facilitated by three types of pupil engagement: cognitive, emotional and behavioural (Christenson, Reschly, & Wylie, 2012; Fredricks, Blumenfeld, & Paris, 2004). Tasks that maximize these three inter-related components of academic engagement, such as agentic engagement, positively influence academic outcomes (Reeve, 2013). The increased attentional allocation, positive affect and enhanced cognitive performance associated with self-referential encoding would seem to fit well with this tripartite understanding of academic engagements, suggesting that self-referencing could influence levels of student engagement.

Supporting this contention, some evidence for enhanced processing under conditions of self-referencing in education has been reported in the context of mathematics. d'Ailly, Simpson, and MacKinnon (1997) showed that for relational word problems (e.g., *John has four sweets. James has two more sweets that John. How many sweets does James have?*) there was a significant improvement in both speed and accuracy following the inclusion of a self-referential term (e.g., *John has four sweets.* ***You*** *have two more sweets that John. How many sweets do* ***you*** *have?*). Such improvements may reflect an increase in task engagement (Davis-Dorsey, Ross, & Morrison, 1991; Fairbairn, 1993; Giordano, 1990; Hart, 1996).

Drawing these arguments together, a logical prediction is that embedding self-referencing strategies in educational materials could fulfil both of Sadoski's (2001) key criteria of effective teaching strategy: promoting rich encoding and increasing engagement in learning. The current study will assess this prediction in the context of literacy education.

1.2. Self-referencing in literacy

Some extant research supports the contention that self-referencing could successfully be applied in a literacy context. For example, children are generally able to write and spell their own names before other words (Levin, Both-de Vries, Aram, & Bus, 2005), and show a marked preference for including (often erroneously) letters from their own name when writing other words (Bloodgood, 1999; Both-de Vries & Bus, 2008; Treiman, Kessler, & Bourassa, 2001). The early focus on own-name letters, particularly the name's first letter, has been attributed to increased sensitivity to this sound–letter combination (e.g., Both-de Vries & Bus, 2010). It is also likely to reflect the extreme familiarity and positivity associated with one's own name (i.e., the 'name-letter effect' - Nuttin, 1985).

Other studies purporting to test a self-referential bias in literacy have reported conflicting results. Pressley, Levin, Kuiper, Bryant, and Michener (1982, Exp. 2) report a deleterious effect of employing self-referential encoding relative to a keyword imagery strategy in adults' learning of new words. However, Mood (1979) showed that sentence comprehension in very young children (2–5 year olds) was significantly improved by inclusion of a self-referential material (i.e., the child's own name). The differences in methodology across these studies (particularly regarding control conditions) is too great to allow firm conclusions to be drawn from the mixed findings, but it is possible that self-referential encoding strategies are best targeted at an early developmental period. Given the equivocal findings reported in these studies, further investigation of the efficacy of self-referential learning strategies is clearly warranted.

1.3. The current inquiry

The current investigation explored whether self-referential encoding could enhance pupil engagement and performance in learning to spell. Experiments were based on a typical literacy task known as the 'See it, Say it, Cover it, Write it, Check it and Write a Sentence' (SSCWC-WS) method, which involves children copying to-be-learned words then including them in a self-generated sentence. The current study evaluated the impact of a self-referential version of this task on pupil engagement and attainment in two experiments, examining novel nonsense- and real-word learning respectively.

2. Experiment 1

This experiment employed four nonsense words presented to pupils as the names of novel alien characters. These materials were used to reduce the effects of prior knowledge on learning outcomes. Children's task engagement was gauged by measuring the length of sentences they generated, as motivation to generate long sentences should be reduced by low engagement (see Meece, Blumenfeld, & Hoyle, 1988; Newmann, Wehlage, & Lamborn, 1992; Reeve, 2013). Behavioural engagement was objectively measured using mean sentence length in words as an index of the child's motivation to engage with the learning task. Other measures of behavioural engagement could also be applied, such as the morphemic complexity of sentences produced, but research indicates that these two measures are almost perfectly correlated (e.g., Brown, 1973; Parker, 2005) and therefore we have favoured