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Who is data-driven learning for? Challenging the monolithic view of its relationship with learning styles

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ABSTRACT

This study examines the relationship between one type of data-driven learning (DDL) and inductive–deductive learning styles. Participants were 145 Japanese university learners of English as a foreign language, all of whom showed significant improvements in a grammar test after teacher-led guided DDL induction. Data were collected using a questionnaire on inductive–deductive learning styles and DDL task values. Weak correlations were found between the inductive–deductive continuum of learning styles and the DDL task value, but no differences in magnitude were found from an examination of the confidence interval for the two correlations. These findings indicate that depending on the type, guided DDL-type induction may be beneficial for both deductive and inductive learners irrespective of their learning styles. The paper concludes with suggestions that future DDL studies should carefully define the construct of DDL and explore its relationship with learner characteristics.

1. Introduction

Advances in corpus studies from the end of the 20th century have had profound effects on language teaching and learning in various areas such as lexicography, grammar, textbooks and syllabi, and test development (Boulton, 2012a; Taylor & Barker, 2008). The most direct application of corpus studies has been when learners receive hands-on experience in directly working with a corpus for learning purposes with guided tasks or materials, a teaching method known as "data-driven learning" (DDL). Since being proposed by Johns (1991), DDL has been used as a language learning and teaching method and has attracted much attention from both researchers and practitioners (Mizumoto, Chujo, & Yokota, 2016). Although the term DDL implies that learners search corpora by themselves (hands-on uses or direct student DDL), the definition also includes hands-off uses such as when teachers prepare concordance printouts for classroom use (e.g., Römer, 2011), especially when introducing DDL to lower level learners. In recent years, there has been an increasing use of DDL in classrooms (e.g., Tribble, 2015).

Despite the diversification in the teaching methodologies for DDL, it has been found that inductive learners appear to benefit most from DDL (Chambers, 2005; Cresswell, 2007; Flowerdew, 2008) as it is inductive in nature (i.e., finding rules from examples). Meanwhile, Boulton (2009a) suggested that "a DDL approach can appeal to learners with quite different styles" (p. 13). These contradictory views suggest, because of the wide range of DDL teaching methods, the relationship

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between DDL and learning styles has yet to be firmly established. This study therefore investigated the relationship between teacher-led, guided DDL induction and inductive–deductive learning styles.

2. Literature review

2.1. Data-driven learning (DDL)

DDL is a methodology that applies corpora to language teaching and learning (Aijmer, 2009; Aston, 2001; Flowerdew, 2012; O'Keeffe, McCarthy, & Carter, 2007; Sinclair, 2004). Current research on DDL has suggested that the advantages of DDL include (a) awareness raising (or noticing) from using a concordancer to recognize patterns and forms to enhance input (Azzaro, 2012; Chang & Sun, 2009; Daskalovska, 2015; Scott & Tribble, 2006), (b) improved teaching and learning of lexico-grammatical items (Huang, 2014; Smart, 2014), (c) error correction in writing and proofreading (Chambers & O'Sullivan, 2004; Chang, 2014; Gaskell & Cobb, 2004), (d) a rich exposure to authentic language use (Chen, 2011), (e) cognitive and meta-cognitive development (O'Sullivan, 2007; Yoon & Jo, 2014), and (f) learner centeredness (Biber, Conrad, & Reppen, 1998). All these benefits have been claimed to contribute to greater autonomy and life-long learning (Boulton, 2009b, 2010; Gilquin & Granger, 2010; Lin & Lee, 2015; Yoon, 2011).

Although DDL is not yet established as part of mainstream teaching practices (Boulton, 2010; Tribble, 2015), presumably due to limitations such as technology, logistics, and the beliefs of teachers and learners (Gilquin & Granger, 2010), it has been proven to be effective as a teaching and learning methodology based on both qualitative inquiries (e.g., Cheng, 2010) and quantitative syntheses (e.g., Cobb & Boulton, 2015). Cobb and Boulton (2015), in a meta-analysis of 116 DDL studies (from 1989 to 2012), found that corpus use (DDL) in the classroom was more effective for learners equipped with DDL skills than for those who did not have those skills and concluded that compared to instructed SLA (Second Language Acquisition) and CALL (Computer-assisted Language Learning), DDL usually resulted in better learning outcomes. DDL studies, therefore, have generally found that when used appropriately, DDL can be a promising alternative, but is certainly not a "panacea" (Boulton, 2009b; Flowerdew, 1996), and has the potential to make positive and significant changes in the English language learning process.

Previous research and curriculum studies have identified and/or developed a wide range of DDL applications, as summarized in Table 1. The distinction between "hard DDL" and "soft DDL" shown in the table is based on Gabrielatos (2005). In this model, the hard version refers to more prototypical DDL, and the soft version can be more conventional instruction with light DDL elements. From the original definition given by Johns (1991), DDL applications have tended to be somewhat inclusive because of the "data-driven" rather than "corpus-driven" label (Boulton, 2011). An example of this diversity can be seen in the number of DDL studies that have been conducted using Google and other online search engines as concordancers (e.g., Boulton, 2012b; Sha, 2010).

Another example is in the use of DDL in lower level classrooms. Boulton (2010) demonstrated a "paper-based" (i.e., concordance lines) DDL approach was found to be more beneficial for lower level learners than traditional teaching approaches. To lessen the cognitive burden on lower level language learners, bilingual concordancers (Chujo, Anthony, & Oghigian, 2009) or guided "convergent" tasks can also be useful (Bernardini, 2004) in combination with teacher-led activities and a deductive instructional approach (Smart, 2014). Another DDL approach for lower level learners is the ease of adjusting the concordancing corpus according to difficulty level (i.e., readability) (Allan, 2008; Chujo, Oghigian, Akasegawa, 2015). This type of text modification practice, however, is not without controversy as some researchers argue that the use of authentic language data is central to the premise of DDL (Daskalovska, 2015; Smart, 2014). Even so, as Boulton (2011) claimed as to DDL, "boundaries are fuzzy, and any identifiable cut-off point will necessarily be arbitrary" (p. 575).

DDL developments in the classroom are motivated by the belief that at an early stage of instruction, teachers are necessary guides for using concordancing in a structured approach if it is to be helpful for lower level learners (Boulton, 2010). Through guidance using "soft" or "deductive" DDL, learners can reach a level of competence whereby they can work with "hard" or "inductive" DDL on their own (Cresswell, 2007; Gabrielatos, 2005). As a result, using DDL in the classroom may cover the

Table 1
DDL variations from research.

Viewpoint	Possible dimensions and continuums		
	Hard DDL	← →	Soft DDL
Corpus data	Authentic	← →	Simplified
Corpus size	Large	← →	Small
Corpus purpose	General	← →	Specific
Concordancer	Web/Local computer	← →	Paper-based
Language	Monolingual	← →	Bilingual
Task	Divergent (No definite answers)	← →	Convergent (Definite answers)
Activity	Student-centered	← →	Teacher-led
Instruction	Inductive (Implicit)	← →	Deductive (Explicit)
Situation	Outside classroom	← →	In classroom
Grouping	Individual	← →	Pair/Group