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Examining connections between the physical and the mental in education: A linguistic analysis of PE teaching and learning

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ABSTRACT

Discourse analyses of science teaching have revealed patterns of knowledge structures (KS) reflecting Halliday's observation that science teaching involves constructing technical taxonomies and relating them in logical sequences. In science education, this pattern has included problem solving as a way for teachers to assess learning. Science has always been considered an academic subject, but how does it compare to physical education (PE)? Given that language is the primary means through which we learn and assess learning, we present a discourse analysis of a sixth-grade PE class taught using a Teaching Games for Understanding (TGfU) approach and compare the discourse to analyses of science teaching. Findings suggest that in the discourse of both PE and science classes, the six KS identified by Mohan as comprising a framework for activities (KF) appear in similar patterns. This focus on similarities rather than differences across diverse disciplinary fields has major implications for educators.

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Introduction

The development of English literacy alongside content is undoubtedly one of the most important goals of any English-medium education worldwide and is especially noted in the recent adoption by several US states of the Common Core Standards (Common Core State Standards Initiative, 2014). The teaching of literacy involves the development of academic language and thinking skills—academically appropriate ways of thinking, talking, and problem solving within disciplinary areas. Dialogue in classrooms has much to do with this development, as discourse plays a central and critically important role at all levels of education (Wells, 1999), and "students who engage in frequent and productive oral discussion of academic subject matter are likely to be better prepared for written academic discussion" (Leung & Mohan, 2004, p. 356).

Much has been written on the language development that occurs in content areas such as science (e.g., Fang & Schleppegrell, 2008; Huang & Morgan, 2003; Lemke, 1990; Martin, 2013; Mohan & Slater, 2005, 2006; Schleppegrell, 2002), history (e.g., Coffin, 2006; Fang & Schleppegrell, 2008; Martin, 2002, 2013), and mathematics (e.g., Barwell, 2005; Huang & Normandia, 2008; Leung, 2005; Street, 2005; Veel, 1999). Yet little has addressed how sports education connects with literacy education; in fact many physical education teachers consider literacy development to be outside their realm of expertise, given their focus on movement and activity (Behrman, 2004; McGuire, Parker, & Cooper, 2002). Are there linguistic connections between the physical nature of athletics and the mental nature of academics that can be exploited for

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CLASSIFICATION	PRINCIPLES	EVALUATION
DESCRIPTION	SEQUENCE	CHOICE

Fig. 1. Mohan's knowledge framework (Mohan, 1986).

the development of academic literacy in PE classes? In this paper we argue that because language is the primary medium through which education is carried out and assessed in all content areas (Halliday, 1999, 2007; Wells, 1999), a theoretically grounded linguistic comparison of the discourse of teaching physical education (PE) and the discourse of teaching science, which is typically considered a much more "mental" content area (a "highly valued domain," as Halliday, 2007, p. 305, stated), should reveal similarities and differences that can inform researchers and educators in both PE and literacy fields.

Framing the study

To begin our examination, we will consider the teaching and learning of PE in the schools from James Spradley's notion of a social practice, a unit that involves cultural *knowledge* and cultural *action* in a theory–practice or reflection–action relation (Spradley, 1980). There are examples of social practices everywhere. Learning to create stained glass art and actually creating stained glass art are both social practices. Teaching and learning about sports games and playing those games are also social practices. Each social practice can be identified by its register:

> Registers are ways of saying different things: using language in different contexts, for different purposes. . . English in the maths class is not the same as English in the history class, let alone English in the drama class or in the playground. Children in the middle school age group are beginning to build up a register range. (Halliday, 2007, p. 52)

Within a social practice, there are knowledge structures (KSs), which are semantic patterns of the discourse, knowledge, actions, artifacts, and environment of the social practice. Whereas Halliday's words strike at the differences that define registers, in *Language and Content*, Mohan (1986) proposed that a small set of KSs can be related to both language and content and thus they can underlie subject area knowledge and thinking. Following Mohan, the KSs in our linguistic model of a social practice are of two levels of discourse: the knowledge or theory level, which includes the KSs of classification, principles, and evaluation, and the action or practice level, which includes the corresponding KSs of description, sequence, and choice (see Fig. 1).

Mohan's work on the connections between social practice and register (Mohan, 2011) addressed the differences between the two levels of theory and practice, suggesting that action discourse is used to *enact* the social practice, while reflection discourse is talk *about* the social practice. Mohan illustrated this difference by suggesting how the reflection discourse of teaching a card game is very different from the discourse of actually playing the game. This idea is especially relevant for our discussion of the language of teaching and learning PE, which can be very different from the language used when students play sports, just as the language of teaching and learning science can differ from the language of doing experiments. By examining the language of a PE unit, we can make judgments about the functions of language – and thus the thinking skills that this language is constructing – that teachers are engaging students in to construct their knowledge of sports. We can then compare such language to the teaching and learning of science.

The theoretical framework

Reflecting the epistemological orientation of systemic functional linguistics (SFL), the argument and analysis presented in this paper uses excerpts of language in context and aims to explain these texts in part by identifying their forms as functional meanings. To do this, we adopt the knowledge framework (KF), fully described in the seminal work on the integration of language and content in Mohan (1986). The KF is a tool, a heuristic that provides a starting point for identifying student tasks and questions that can help integrate the development of academic language with the content knowledge. It reflects the categories of thinking skills identified in curriculum documents, resource guides, and textbooks across a variety of subject areas in Western Canada (see Early, Thew, & Wakefield, 1986). These thinking skills recurred in the curriculum objectives and manifested themselves in the way language was used throughout these documents.

The KF is comprised of six boxes representing three related pairs of knowledge structures, or KSs, as shown in Fig. 1.

These three pairs form theory/practice relationships that can be illustrated simply in the following ways:

(1) Classification/description: Describing something infers an understanding (theory) of a set of classifications such as color, size, or other typologies/taxonomies. Teaching new classifications of "things" or "actions" involve ensuring that students understand and can label these things or actions in some way that is valued in the discipline they are studying.