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# Patterns of oral Choice and Evaluation across secondary content areas

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## ABSTRACT

Our study focuses on Choice and Evaluation, two of Mohan's knowledge structures to uncover how teachers and students across content areas developed disciplinary knowledge through classroom talk. Participants included in-service teachers and their students in rural and urban secondary schools in the Eastern and Western US. Through Choice and Evaluation, we examined opportunities for students across four disciplines to build up their knowledge of content matter or *field*. Findings revealed that teachers of math and science built students' field knowledge through classroom exploration, eliciting Evaluation in dialogic patterns involving Choice, while social studies and language arts teachers helped students implicitly use Choice/Evaluation through projects based on their previous experiences. The essential role of student background knowledge in enabling participation across different types of oral exchanges is shown. This study uncovers tendencies across classrooms and makes linguistically informed suggestions for teachers in the disciplines.

## Introduction

In secondary language-and-content classrooms, talking about content is key to unlocking the door to academic literacy for many first- and second-language learners (Baker and Wright 2017; Walqui and van Lier, 2010). Sociolinguists and anthropological linguists have long argued the importance of talk for building language and literacy. In her seminal study, Heath (1983) showed how differences in students' home and school orality/literacy practices negatively impacted how students were perceived by teachers in formal educational settings as well as students' more general academic success. From a sociocultural perspective, the development of cognition progresses from the external to the internal plane, enabling human beings to internalize concepts by first talking with others (Lantolf and Thorne 2006; Vygotsky 1978). This has clear implications for pedagogical practice, which must necessarily offer opportunities for students to talk with others – and more importantly for teachers to design and scaffold such opportunities into their classrooms, providing dialogic opportunities for inquiry that run counter to more traditional teacher-centered practices (Haneda

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and Wells 2013). Sociocultural theory, as an overarching theory of learning, can guide pedagogical implementations which view learners as active agents in their learning processes. Such theories complement a systemic functional linguistics (SFL) theory of language, which views language as a tool that humans use to make meaning in situated contexts (Wells 1994). From the SFL perspective, the first stage of pedagogical practice necessarily entails building learners' knowledge of *field* or content (Martin 2009; Rothery 1996). The teaching–learning cycle (TLC), the pedagogical framework guiding much of the literacy work in Australian schools and more recently schools in the USA (Brisk 2015; Gebhard and Harman 2012; de Oliviera 2016), involves first building learners' background knowledge of the topic; effectively activating their background schema and memory before engaging in other activities that involve deconstruction of texts, joint-constructed writing, and finally independent writing. This paper will show how content knowledge is developed through talking about content and how talking about content varies depending on what the subject matter is. We, the researchers, use middle and high school math, science, social studies and language arts classrooms to illustrate and describe differences in oral language patterns across disciplines in school settings. This paper aims to provide teachers of these disciplines and researchers of classroom discourse with a more nuanced, informed understanding of the role of oral language in multiple classroom tasks.

## Academic literacy building across disciplines

### Academic language: building resources in context

*Academic language*, also referred to as *academic discourse*, *advanced literacy,* and *cognitive academic language proficiency* (Christie 2002; Crosson et al. 2012; Cummins 2013) relates to the forms and functions of language that are necessary for participating in various schooling contexts. 'If teachers are to integrate language and content in the classroom, they need ways of organizing material to aid both content development of language and the development of understanding' (Mohan 1986, p. iv). From a SFL point of view, academic language development is about increasing learners' meaning-making resources in specific situational contexts (Halliday 1998; Halliday and Matthiessen 2004; Martin 2009).

Academic language in English can be identified by a set of lexical and grammatical features. One of the challenging features of academic written English is its high *lexical density* (Fang and Schleppegrell 2008; Schleppegrell 2004). Lexical density is defined as the number of content words as a total proportion of all words in the text. Lexical density increases as a result of grammatical metaphor and nominalization. Halliday (2007) describes grammatical metaphor as the reconstrual of 'a model of experience in which the basic unit is an action or event…with the process represented as a verb and the participants as nouns' (p. 379). While high lexical density is often a feature in written academic texts, spoken academic English has its own set of lexicogrammatical features. *Grammatical intricacy,* defined as how frequently a clause complex shows up in a text in comparison with simple clauses, is usually used to analyze spoken texts. Halliday (2008) notes the problematic nature of measuring grammatical intricacy, noting that 'Spoken language is inherently dialogic in nature, with very many short turns guiding the interaction' (p. 161) and developing content as strings of hypotactic and paratactic clausal patterns. Halliday (1994, p. 220) differentiates this 'choreographic' quality of spoken English from the 'crystalline'

| | Classification | Principles | Evaluation |
|---|---|---|---|
| **Reflection** | | | |
| **Action** | Description | Sequence | Choice |

Figure 1. The KF's three action/reflection pairs of knowledge structures.

quality of academic written English, in which content is densely packed in nominal constructions.

In school settings, spoken academic discourse goes beyond interactions dialogic in nature, and typically requires a wide range of language functions. For instance, a debate or an oral presentation may occur in the form of a monologue that entails various language functions through the use of a variety of lexical and grammatical resources. Thus, to analyze spoken academic classroom discourse, one needs an analytical tool capable of dealing with a variety of language functions. In comparison to much spoken monologue and written academic text occurring in a pedagogical setting, the grammatical intricacy of dialogic spoken exchanges between teachers and students is greatly increased. Considering that the focus of our study was to examine the connections between classroom talk and knowledge development, as well as teacher and student patterns of talk about content in various school subject areas, we have chosen Mohan's knowledge framework (KF), which is shown in Figure 1, as an analytical tool to examine teacher and students' oral language through analyzing form-function, wording-meaning connections (Mohan, 1986, 2007).

The KF is a heuristic for academic language/literacy, which identifies six knowledge structures (KSs)/social practices that are identifiable both in written and spoken discourse. KSs are social practices with both an action and a reflection component (Mohan 2011). They provide a context for relating social action to social interpretation. In this sense, all of our daily activities, from the way we discipline our children to the way we greet one another on the street, are examples of social practices with action/reflection, or practice/theory elements. This corresponds to Halliday's (1999) context of situation and context of culture, respectively. Social practices determine the way in which we articulate tacit knowledge and dictate our social behavior and language. They provide us with an implicit list of 'dos' and 'don'ts', from which we draw in order to act and interact with the world and the people around us. As a learner is socialized into a particular field of knowledge from the simplest tasks of daily life to the more abstract study of a discipline, the person is learning the ways of speaking, acting, and thinking appropriate to the context. As Huang (2004) explains,

> In the KF, all human activities, one kind of which are classroom activities, are socioculturally (socially as in different classrooms with different people forming different social relations, culturally as in engaging in different cultures being learned such as science) organized around specific content topics. The content organizes the topic, and the way a particular activity is organized structure the knowledge to be acquired and the language to be used, which in return further structure the activity (102).

Within any activity, the KF's core KSs include at a general or reflection level–Classification, Principles and Evaluation; and at a specific, or action level–Description, Sequence and Choice. The KF draws on research in SFL, noting that certain KSs are enacted through certain wordings (i.e. lexical and grammatical patterns, what Halliday terms 'lexicogrammar'). For example, 'being' processes are common in the first, far-left column; these correspond to Halliday's relational (e.g. is/are/has/had) and existential (e.g. There is/are…) processes. A classification statement commonly employs a being structure followed by descriptive language: *Animals* **can be divided** *into two groups: vertebrates and invertebrates. Vertebrates* **has** *two special groups called warm blooded and cold blooded*' (Early, Mohan and Hooper, 1989, p. 118). From the classification of animals, students can move on to describe a particular type of animal (e.g. whales) and then to discuss these animals' habitats, diets, life spans, etc.

Halliday (1994) distinguishes *being* processes from *doing* and *sensing* processes. Doing processes include material (e.g. swam/eat) and behavioral (e.g. feeds) processes; sensing processes include mental (e.g. perceives, thinks, feels) and verbal (e.g. says, asks) processes. Each KS reflection/action pair has its own linguistic features and involves particular thinking processes. For instance, when one engages in an activity of *classifying matter*, certain linguistic features associated with classification of matter (such as *organic, inorganic* as vocabulary; *is categorized* as a grammatical feature; classification text pattern as a discourse feature) and the thinking skill for analyzing (categorizing, grouping, sorting, etc.) are likely to be utilized. Thus, the KF plays the role of linkage between specific aspects of content and specific language features at word-, sentence-, and discourse-levels while at the same time providing opportunities for various levels of cognitive engagement.

One of the main uses of the KF has been to provide a tool that builds learners' linguistic resources in the context of school subjects. The KF works under the assumption that content-based topics or ideational meanings determine language users' choices of lexicogrammatical resources. Systematically implemented in content-based language classrooms across western Canada, the premise of the KF is based on claims that certain patterns of language – and thus, certain patterns of thought – are similar from situation to situation. Early (1990) emphasizes the fact that if indeed certain patterns of academic language are the same, these structures offer students, English learners (ELs) in particular, a valuable resource. If students can learn these common patterns of classroom discourse, they will be able to use them repeatedly across contexts and content areas.

### Why Choice and Evaluation?

As children are apprenticed into the language of different content areas, they must make innumerable choices. As sociolinguists have reasoned, some children's home lives better prepare them for the types of language valued in schooled contexts (Bernstein 1972; Hasan 1992; Heath 1983). 'The what, how, and why of patterns of choice [children] can exercise in their uses of language prepare them in very different ways for what lies ahead in school and in work or other institutional settings…school is a sudden flood of discontinuities in the ways people talk, the values they hold, and the consistency with which the rewards go to some and not others' (Heath 1983, 347–348). Language as choice is a major tenet of the SFL theory of language (Halliday 1994). The terms Choice and Evaluation, as we will use these terms here, however refer specifically to two of Mohan's six KSs paired

together as an action/reflection pair within the KF heuristic. We will capitalize the terms *Choice* and *Evaluation* to distinguish them as KSs.

Previous research has shown the Choice/Evaluation action/reflection pair to be particularly relevant to mainstream content classrooms with integrated ELs. Some research has found that Choice and Evaluation in particular were challenging for ELs to enact (Gleason and Schmitt 2015, Gleason and Slater 2017). Consider the following example taken from a third grade science unit about whales where the teacher asks students a question eliciting Choice:

> Teacher: Which would you rather be: a free whale or a whale in captivity? (eliciting Choice)

Possible student responses to such a question might include 'A free whale!' or 'Free' or even simply a gesture pointing to an image of a free whale projected onto a classroom screen. Choice, in particular, can be easily expressed, oftentimes by using limited language (*this/that*) or mere gesture (pointing, circling an alternative). However, in typical school settings, when a question such as this is posed, seldom will it be left at that. The next question the teacher asks will likely involve Evaluation, in which the student will have to justify his or her Choice with evidence. At the end of a unit on whales, we would expect informed Choice via Evaluation that usually encompasses other KSs (see Mohan 1986; Huang 1996; Huang, Normandia, and Green 2005) such as Classification/Description (e.g. *whales **are** a type of mammal which **have** either baleens or teeth*), and Principles/Sequence (e.g. *whales often **migrate** to the coast of Mexico in the winter **to feed** and **give birth** to their young*). Therefore, the language choices needed to fully convey ideas related to the action of Evaluation on the right-side of the KF often require the language and thinking of the reflection/action pairs of the entire KF.

Many traditional classroom conversations involve teachers eliciting student Choice and Evaluation, yet students often struggle to express these KSs. Choice, although not linguistically complex, can present difficulty for students in classroom settings due to the mere fact that it is almost always accompanied by Evaluation, its action/reflection pair. Huang, Normandia, and Green (2005) found that in one mathematics classroom, the teacher attempted to socialize students into the discourse of school math by having students take on the role of teacher at the front of the room to demonstrate *how* they solved a problem, and then by having them talk about *why* they solved it in such a way. Although the teacher's discourse included a rich array of all six KSs, and while her students were able to use the three practical KSs (e.g. Choice, Description and Sequence) to talk about *how* they solved the problem, when the teacher consciously pushed for KSs of reflection (e.g. Evaluation, Classification and Principles), students were less able and almost always unsuccessful at explaining *why*. Indeed, as Huang, Normandia, and Green (2005) assert, when the students in their study were pushed to back up their decisions for why they answered a problem with one solution or another, they often appeared to hesitate or seemed less capable, which resulted in the teacher taking over the work for them.

### Changing traditional classroom talk

Much research on classroom talk has examined teacher evaluation as a component of the traditional Initiation, Response, Evaluation (IRE) sequence (Cazden 1988; Gibbons 2009; Zwiers 2014). Although the IRE sequence has been found across classroom types and

content areas, researchers have not found it to be particularly effective for developing students' academic language, in part due to the fact that during IRE interactions, the teacher does most of the talking. Gibbons (2009) shows how the evaluation move of IRE shuts down student talk, and instead recommends an alternative to the 'E' move of the IRE which she refers to as the *third move*. Instead of closing down student talk by providing an evaluative response (e.g. *good job*), the third move, usually a follow-up question, allows for more of an extended response from students by leaving the conversational exchange open for them to engage in additional talk.

Verplaetse (2000) and Verplaetse and Ferraro (2016) offer further alternatives to the traditional IRE. Instead of an 'Initiation' move, they recommend a wondering 'W' move, which involves the teacher wondering out loud, invoking ideas and 'wonderments' that are both open-ended and authentic (i.e. questions to which the teacher does not already know the answer). A second recommendation they give for changing traditional IRE is to replace the 'E' move with a listening 'L' move, effectively encouraging teachers to move their classroom discussions from traditional IRE sequences toward Wondering, Response, Listening (WRL) sequences.

## *Language across the disciplines*

There has been abundant research showing how language varies across disciplines (Huang and Normandia, 2008; Lemke 1990; Schleppegrell, Achugar, and Oteíza 2004). The language of math, science, history, and language arts each has its own way of constructing particular wordings to express disciplinary meanings. While most of the work showing how language varies across disciplines has been done using written discourse, limited research attention has been given to oral discourse analysis in classroom settings from an SFL perspective (e.g. Gibbons 2006; Huang, Normandia, and Green 2005). Given the importance of building students' field knowledge by first talking about content, as well as the challenge that many students have engaging in the classroom social practice of Choice/Evaluation, our study aims to explore how classroom oral patterns of Choice and Evaluation vary by discipline. Specifically we pose the following overarching questions:

(1) How do teachers and students in secondary classrooms across content areas develop knowledge through oral language involving Choice and Evaluation?
(2) How do linguistic patterns of oral Choice and Evaluation differ across secondary content areas?

## Methods

This study adopts an exploratory, qualitative discourse analytic approach to examine oral discourse samples in a variety of content-area classrooms. The discourse samples were transcribed by graduate-student observers (GSOs) before being given to the researchers, therefore, the research is not ethnographic in approach but rather textual with researchers examining a written representation of what was observed and digitally recorded by GSOs. The GSOs who transcribed the oral discourse samples also provided a brief description to the discourse to explain (a) where in a lesson the oral sample took place, and (b) what activities took place prior to the oral sample. Although we have some understanding of

the situational context, learner identities and lesson sequences are not the focus of our analysis. Rather, we drew on the theory of the KF as discussed above to identify Choice and Evaluation in the transcribed oral discourse samples. For question 1, we examined what reflection/action pairs were employed un/consciously by the interlocutors to develop knowledge of field, using both a deductive approach (i.e. identifying the theorized language of the KSs) and an inductive approach (i.e. determining additional or absent language choices). For question 2, we analyzed the transcripts recursively to compare the linguistic patterns across the content area classroom discourse transcripts. We will present the findings in relation to the two questions in order following this section on methodology.

## Research contexts and participants

This study took place in several schools within the Eastern and Western United States in urban and rural school districts. GSOs gathered discourse data in classrooms as part of their coursework in programs for graduate coursework in Teaching English to Speakers of Other Languages, or Culturally and Linguistically Diverse Education. In the eastern USA, GSOs conducted several classroom observations to audio record and transcribe a dialogic exchange that demonstrated an aspect of Mohan's KF. The GSOs in the western USA were teachers who audio recorded, transcribed, and analyzed classroom discourse in their own teaching practice. Although the transcriptions were accompanied by additional information that provided understanding of the context of particular students within particular settings, the transcribed oral samples were the focus of this analysis. The researchers also observed in the classrooms at least one time during the semester, and found the transcriptions to be reliable samples of the type of oral activities that took place within the GSOs given classrooms. For example, typical activities in United States schools that teachers employ include whole-group discussions, small-group discussions, talking in pairs, student informal talks, and formal presentations followed by questions. These instructional approaches are common vehicles for fostering discourse for learning.

## Methods of data collection

The data collected and transcribed by graduate students in classrooms across content areas included 24 lessons in secondary level classrooms. Transcripts captured discourse from one lesson in natural science, four in math, six in social science, and 13 in language arts classrooms. As Gibbons (2009) discusses, the same teachers may exhibit different patterns of talk dependent upon the location of a lesson and/or phase of a lesson within the larger organization of a unit. Therefore, we made no claims as to the diversity of any of the teachers' repertoires of instructional talk and techniques, but rather focused on the Choice and Evaluation aspects of transcribed oral discourse, ensuring that the disciplines of math, science, social studies, and language arts were represented. For ethical considerations, oral discourse data were sorted and analyzed after the course work for GSOs had ended and course grades had been submitted. Special care was taken to protect the identities of the schools and K-12 learners that generated the discourse samples. Our study is exploratory and tentative in nature. Despite the shortcomings of not having full case studies of all the teachers, or ethnographic description of the classrooms, we believe our work

will open the door for further research of oral language interactions across the academic disciplines to identify similarities and differences for the benefit of teachers and learners.

## Methods of data analysis

After collection of data, we did a first reading through all transcriptions to determine if Choice and Evaluation as defined in Mohan's KF was present, eliminating transcripts that centered more on other reflection/action pairs. We then examined the transcribed oral interactions from four lessons that clearly expressed the KSs of Choice and Evaluation, and identified rich examples of the language used to realize Choice and Evaluation. We then color-coded key samples selected from each of the four content areas, according to Mohan's 2007 work in which he points out that the language of Choice includes (a) generic reference, (b) sensing process, (c) comparative conjunction, and (d) evaluation lexis; the language of Evaluation includes (a) specific reference, (b) sensing process, (c) alternative conjunction, and (d) alternative/choice lexis. The process was not linear. Each time a member of the team read through a transcript, we discussed our findings with the other members of the team. We also analyzed emergent ideas that aligned with Mohan's KF categories of Choice and Evaluation. The process was recursive with continual discussion between researchers as we returned to various portions of the transcripts to support or refute our ideas before agreement on a final analysis of the transcripts. To the above list of Evaluation language from Mohan, we added mental processes and consequential conjunction, as these were also discovered during our data analysis. These were added to our color-coding scheme. The color-coding scheme that emerged was reworked to accommodate black and white print journals; therefore, we use the following font forms in this paper:

> **Bold**: Mental/sensing processes and mood (e.g. imperative, etc.)
> *Italic*: Consequential/comparative conjunction and modality (e.g. *if, should, would*)
> <u>Underlined text</u>: Generic/specific reference (e.g. noun participants)
> ***Bold italicized text***: Choice and evaluation lexis

## Findings

The findings presented here will showcase excerpts of transcribed oral classroom discourse from four different secondary classrooms with integrated ELs: 6th grade mathematics, 8th grade natural science, 7th grade social studies, and 9–12 language arts. The aim here is not to make claims that all classrooms will necessarily represent or reflect similar patterns, but rather to explore tendencies and typicality from our corpus.

### A 6th grade conversation about math

Example 1 shows an excerpt from a conversation between a teacher and several students about the ways to find a percentage. The teacher (T) initiates the conversation by eliciting Choice from Nick[1]. (N). The functional grammar features seen in the teacher's elicitation of a Choice includes a command using the imperative mood (**tell me what**…**tell me how**) and a sensing/mental process (**decided**). The student's Choice includes a sensing/mental

**Example 1.** 6th grade math conversation.

| | | |
|---|---|---|
| Teacher: | Okay, let's look at ten percent. Ten percent of…you need to write in the same number. Ten percent of two hundred. How do you…Actually, **tell me what** ten percent is first … and then **tell me how** you **decided** to figure it out. | Teacher elicitation of Choice |
| Nick: | Twenty. And I **decided** to find it *because* you can find the ten percent value of a number if you move the decimal one time to the left. | Student Choice |
| Teacher: | *Okay*, and what does that mean when I move the decimal one time to the left? What am I actually doing to the number? **How come** I get to do that? | Teacher elicitation of Evaluation |
| Nick: | *'Cause* you divide by ten on both sides. | Student Evaluation |

process (**decided**) and a consequential conjunction (*because*). In this case, Nick offers an Evaluation of his Choice without being prompted. He moves from the plane of action discourse using the specific noun participant (I) to the plane of theoretical reflection discourse with a generic noun participant (you). The teacher Evaluates Nick's Choice/ Evaluation pair (*okay*) and follows up with a further elicitation for Evaluation using interrogative mood (**how come**…**?**). To this, Nick responds with another consequential conjunction ('*cause*), again building on the teacher's specific noun participant (I) and generalizing to a general participant (you) to express theoretical laws of math.

What we can take away from Example 1 is that the teacher elicits Choice and Evaluation and the student uses consequential conjunctions paired with other KSs (in this case Principles) to enact Evaluation, justifying Choice. The teacher actively helps this student build general, theoretical meanings from specific referents. Building on 'the here and now,' the student effectively moves from the plane of action (personal experience) to the plane of reflection (theoretical law), thus finding general laws of percentages. The teacher and student do this together using a particular sequence of Choice and Evaluation.

### An 8th grade student-led small-group discussion followed by a teacher-led large-group discussion about science

Examples 2–4 examine oral discourse from an 8th grade natural science classroom. Example 2 shows an excerpt from a conversation among three students who were put into small groups to perform an experiment with a metal washer. Example 3 shows a student–teacher conversation in the larger-group setting that follows up on the experiment and Example 4 shows how the teacher moves students toward linking that experiment to a more general theoretical understanding of Newton's First Law. We break this larger oral transcript into three small sections for convenience of presentation.

The functional grammar features of this small group conversation include specific noun participants (the washer, the bottom, I) to describe the experiment in Turns 1–2,

**Example 2.** 8th grade small group science experiment.

| Turn | | |
|---|---|---|
| 1 | S1: | So it looks like one washer stayed up but the bottom collapsed, right? |
| 2 | S2: | *Yeah*. Let's write it down. Time will be up in a few minutes. |
| 3 | S3: | Okay, now it says explain your observations in terms of Newton's First Law. |
| 4 | S2: | Well, observations that I **noticed** is that unless an object is being forced, it will stay at rest or continue to move. |
| 5 | S1: | *Yeah*, *but* an object won't continue to move *unless* it is already in motion *or* it is forced to move by another outside force. |
| 6 | S2: | (*laughing*) That's what I just said. (*the group writes down their responses on their individual papers*). |

**Example 3.** 8th grade large group follow-up to the science experiment.

| | | |
|---|---|---|
| T: | **Why do you think** that happened, class? | Teacher elicitation of Evaluation |
| S4: | *Because* the objects stayed at rest until <u>they</u> were acted upon by <u>an outside force</u>. <u>The two washers that were flicked into the four</u> were <u>the outside force</u>. | Student Evaluation |
| T: | Everybody agree? ***Alright***. | Teacher Evaluation |

followed by generic noun participants (<u>an object, it, another outside force</u>) in Turns 4–5. In Turn 3, Student 3 manages the activity by drawing students' attention to a worksheet which prompts students to link practice (direct experiment) to theory (Newton's Law). In Turn 4, Student 2 makes a Choice using mental process (**noticed**) but fails to link the observed specific participant (<u>one washer</u>) from Turn 1 to the generic object (<u>an object</u>), thus only weakly implying a theoretical law. Similarly, student 1 offers both an Evaluation (***Yeah***) of Student 2's statement and an alternative observation using alternative conjunctions (*but, unless, or*), but still fails to link the experiment and the specific and generic noun participants (<u>an object, it, another outside force</u>). Although there are not many linguistic features of Evaluation in this excerpt, the small group discussion indicates Choice and Evaluation. Evaluation is mainly established through the use of Principles (condition-result) generalized through the experiment.

Example 3 shows an immediate follow-up conversation involving the teacher and the larger group. Notice that in the large group follow-up, Student 4 is able to directly connect Newton's general Law of Motion to the specific experiment by using both a generic participant (<u>an outside force</u>) and the specific participants (<u>the objects, they, the two washers that were flicked into the four, the outside force</u>), something that the students in the small group involving Students 1–3 were not able to do on their own.

In Example 4, the teacher takes the lesson one step further. Students not only have to link their experiment to Newton's First Law, but they also have to extrapolate this law to form a hypothesis about scientific concepts that they could not directly see or touch (e.g. force and friction).

**Example 4.** 8th grade large group extrapolation.

| Turn | | | |
|---|---|---|---|
| 1 | T: | Let's move on to talk about Part B. **How** does Part B relate to Newton's First Law of Motion? Because you pulled out the part or the circle and the mass stayed there. **How** does it relate? The weight we placed on the paper **was it** *in motion* or **was it** *at rest*? | Teacher elicitation of Choice |
| 2 | S5: | ***At rest.*** | Choice |
| 3 | T: | ***Okay***. At rest. Everyone agrees? | Teacher Evaluation |
| 4 | T: | **How much** force was put on the weight? | Teacher elicitation of Choice |
| 5 | S6: | ***None*!** | Student Choice (erroneous) |
| 6 | T: | **How much**? *If* <u>you</u> did <u>it</u> slowly, *would* <u>it</u> move <u>it</u>? | Teacher elicitation of Choice |
| 7 | Students: | ***Yes*!** | Student Choice |
| 8 | T: | ***Okay***. | Teacher Evaluation |
| 9 | T: | *But if* <u>you</u> did <u>it</u> slowly, *probably* not <u>enough</u> of **what kind of force**? | Teacher elicitation of Choice |
| 10 | S6: | ***Friction*!** | Student Choice |
| 11 | T: | ***Yes*!** | Teacher Evaluation |

In Example 4 we can observe a complex scaffolded conversation involving Choice and Evaluation. In the first turn, the teacher elicits Choice by providing two questions with choice lexis and an alternative conjunction (**was it *in motion*...*or*...was it *at rest***). In Turns 2–3, Student 5 makes the correct choice (**At rest**) and the teacher evaluates (***Okay***). In Turns 4–5, the teacher again elicits Choice (**How much?**), but this time Student 6 gives an erroneous answer (***None***!). In Turn 6, the teacher must backtrack to scaffold students' understanding by eliciting Choice involving a yes/no question. He does this by using a conditional conjunction (*if*), specific noun participants (you, it), and modality (*would*) to imply a particular hypothetical scenario. In Turns 7–8, students collectively answer (***Yes***!) and the teacher evaluates (***Okay***). In Turn 9, the teacher immediately follows up with another elicitation of Choice this time involving a question prompt (enough of **what kind of force?**), which includes both alternative and conditional conjunction (*but, if*) modal adjunct (*probably*) and specific noun participants (you, it) to elicit a final Choice. In Turns 10–11, Student 6 makes the correct Choice (***Friction***!) and the teacher evaluates (***Yes***!).

## A 7th grade whole-class, student-led discussion in social studies

Example 5 showcases a student-led question-and-answer session which took place immediately after a student (Marco, an EL) gave a presentation about a social studies topic (child labor laws) that was directly linked to his personal experience (working in the fields).

One of the remarkable aspects of the question-and-answer interaction shown in Example 5, in addition to students' ability to take on the typical teacher role of eliciting Choice, is Marco's tendency to provide unsolicited Evaluation to accompany Choice. We see this tendency in Turns 2, 4, 6, 8 and 10, where Marco construes Choice, effectively

**Example 5.** 7th grade social studies post-presentation big group Q & A.

| Turn | | | |
|---|---|---|---|
| 1 | Student 1: | **What's** your *favorite* part about [working in the fields over the summer]? | Student elicitation of Choice |
| 2 | Marco (M): | It's *waste time* on ***something useful that teaches you something*** and you also *win* money and you *can buy* something for you or *help out* in the house. | Student Choice and unsolicited Evaluation |
| 3 | Student 2: | **What** will you do *if* they pass the law? | Student elicitation of Choice |
| 4 | M: | I *would break* it *because* I *can't* just be laying around doing nothing at home. I *have to do something*. | Student Choice and unsolicited student Evaluation |
| 5 | Student 3: | **How** does this *benefit* you for the future? | Student elicitation of Choice |
| 6 | M: | It **teaches** me that working is not something you *should be playing around with*, that it is *important*. It also **teaches** me new stuff *so* if I **want** like **work** at something [*then*] I already **know** how to do some of it. | Student Choice and unsolicited student Evaluation |
| 7 | Student 4: | **How** does it *benefit* you now since you get to work all summer? | Student elicitation of Choice |
| 8 | M: | [I **want**] money and I *can buy* some stuff for me and my family members. | Student Choice and unsolicited Evaluation |
| 9 | T: | **How** does it make you **feel** to know you have the ability to earn some money and to work and be responsible? | Teacher elicitation of Choice |
| 10 | S6: | *Good because* it is ***better than just*** asking for money from your parents. *If* you **want** it [*then*] you *can buy* anything and *if* you ask your parents [*then*] they *will ask* you what and they *have to give* you permission. *Since* I **want** it, [*then*] I *can buy* ***anything I want***. | Student Choice and unsolicited student Evaluation |

answering the students' and the teacher's questions as well as providing Evaluation to justify Choice without ever being asked to do so.

Example 5 is laden with Marco's Evaluation language (***waste time, useful that teaches you something, important, better than***, etc.), use of sensing/feeling processes (**teaches, want, know**), modality (*would break, cannot just be lying around doing nothing,* etc.) and nominalized and often embedded participants (working, not something you should be playing around with, asking money from your parents, etc.). Marco's use of *if…then* language to express hypotheticality to argue his point of view that working in the field is beneficial for children is remarkable (*so if* I **want** like **work** at something [*then*] I already **know** how to do some of it, *If* you **want** it [then] they will ask you…, *Since* I **want** it, [then] I *can buy anything I want*). Notable is Marco's ability to move from the plane of action and personal experience using specific noun participants (I, me) to the plane of general law involving generic noun participants (working, not something you *should be playing around with*) and to do this all with low-level scaffolding from his peers and teacher.

### *A 12th grade student oral presentation in language arts*

Example 6 highlights an EL student's oral presentation in a high school Language Arts classroom. The students had completed a unit on the rhetorical devices of *logos*, *ethos*, and *pathos*. They had read passages that drew on each one of the devices before reading a longer persuasive piece by Viktor Frankl that uses them all in concert. The expectation for the students was that they would identify the author's selection of literary devices and then present their findings during an oral presentation. Each student was provided a visual graphic organizer to write down their ideas, and the presenter was allowed to hold the visual and reference it as s/he spoke.

Example 6 showcases the result of explicit guidance from the teacher asking for an analysis of a literary work using the concepts of 'logic,' 'emotions,' and 'ethos or ethics.' The requirement specified that students articulate what rhetorical appeals were used in the chosen piece and how they were accomplished. The teacher's provision of clear

**Example 6.** 12th grade language arts student presentation.

The way Viktor Frankl uses logic, I would ***believe***, is he mentioned the fact that boy ***wanted*** a lot of money, that sixty percent of the boys, in America, ***wanted*** money, a lot of money, which is a fact *because* he used percents of pretty much studying people. And then another reason why I *believe* is *'cause* he used another ***logical explanation*** by saying that seventy-eight **were concerned** about not knowing themselves. So, I ***believe*** this [is] *because* you know he is **making it seem** as [if] Americans, seventy-eight percent of them, really **did not know** themselves or **did not understand** what they were going through themselves.

And on emotions, what I really took from him was that everyone has frustrations and obstacles to overcome and it's up to you on how you can handle it. *So* by that I ***believe*** he used it *because* he ***wanted* to help** the audience **understand** a little bit more of what he was speaking about or more of what he was going through, ***meaning sympathizing*** or something like that. And also by telling you, you *can do* it your way, which is sometimes ***not the best way***, *or* you *can try* other routes.

Now, ethos or ethics I ***believe*** he used these to get them to ***believe*** him or ***sympathize***. He **motivates** his audience into *believing* in others, *so* I ***believe*** he **motivates** his audience to ***believing*** in others, I say this *because* his saying where *if* you overly estimate somebody [*then*] you *can make* them *believe* more of themselves, you *can push* 'em into becoming what they really can. And *if* you just leave 'em or treat 'em as to what they are, *then* there is ***no motivation*** for them to move forward. *If* you tell a person all he is going to be is a drug addict *then* I ***believe*** that's all he is going to be. *If* you show him differently, *or* show him that he *can do it* and [*if you*] treat him to ***a higher standard***, *then* he'll *probably stop.*

guidelines for this oral presentation and the accompanying graphic organizer help to explain the longer stretch of discourse that was produced.

In Example 6, we can see a variety of lexicogrammatical features that are typically used in the discourse of Choice and Evaluation. They include sensing and feeling processes (**wanted, believed, did not know, did not understand,** etc.), causal/consequential/conditional/comparative conjunction (*because, so, if…then, or*) and modality (*can, probably*, etc.), as well as ample Choice/Evaluation lexis (***believe, wanted, a lot of, logical explanation, a little bit more, not the best way, higher standard,*** etc.). This student's presentation also exhibits ample nominalizations and embedded clauses (what they were going through, your way, which is sometimes *not the best way*, etc.), typical features of written-like academic language.

Example 6 stands in opposition to the others in several respects. First, with respect to the mode of transmission, it is less dialogic and more monologic, at least at this point in the lesson. Second, this change in mode implies that the Choice/Evaluation is completely student generated, or perhaps we might say that the nature of the presentation task requires that Choice be accompanied with Evaluation in the form of evidence and justification in order to make a compelling case.

The discourse samples from the four secondary content-area classrooms we have shown present numerous differences. Science (Newton's law of motion) and mathematics (percentages) required explicit justifications (Evaluation through other KSs), where teacher's scaffolding of traditional IRE classroom talk guided students' understanding and allowed for formative assessment. During the social studies and language arts lessons, students offered justification and reasoning without being prompted. This included rich Evaluation lexis, use of sensing/feeling processes, nominalized embedded participants, complex causal, consequential, conditional, and comparative conjunctions (e.g. *if…then, since, because, so, or*), and modality (e.g. *can, probably,* etc.). Part of this was due to (a) students already possessing extensive field knowledge and (b) the language arts task providing students with ample planning time. We take up the discussion of students' prior knowledge in the next section.

## Discussion

Based on these four examples, we can see that for topics that students did not have intimate experience with, such as the science experiment using nickels to understand Newton's law of motion or the math lesson about finding percentages, teachers were the ones doing most of the Evaluation talk and had to elicit follow-up students' contributions with explicit requests for Evaluation/Choice discourse, and use of Y/N questioning techniques. This finding mirrors those of Huang, Normandia, and Green (2005), who found that scaffolded interactional sequences helped students' development of talk about the field and they included much hands-on practice and teacher guidance at the whole-group follow-up stage. During these sequences, teachers helped students to build up their understanding of the topic and to link action and reflection. Nevertheless, more scaffolding could have occurred during classroom conversations in order to help students to successfully complete these tasks (Gibbons 2006, 2009).

Much of the work on the teaching-learning cycle (TLC) (Brisk 2015; Gebhard and Harman 2012; de Oliviera 2016) has foregrounded the importance of building up learner

schema and background knowledge. For topics that students did already have intimate practical experience with, such as the Social Studies lesson about potential state and federal laws that would have direct impacts on students' lives, and the high school English presentation where teachers made planning time available, students tended to offer justification/reasoning without being prompted and to assume the role of expert. During these moments, student-generated Evaluation relieved teachers of their duties as orchestrators of such classroom talk; and students put on the hats of experts, thus producing Choice and Evaluation discourse without typical IRE scaffolding. These two lessons illustrate how it was easier for students to link action discourse to reflection discourse (a) when they are positioned in the knowledgeable role of 'expert,' having been given time to collect their ideas, and (b) when they possessed previous life experiences, and/or reading opportunities, that had built up their knowledge of field.

A major difference then, as we can see, is that while science and math teachers were simultaneously building students' field knowledge and language knowledge, their expert content knowledge flowed, for the most part, uni-directionally from teacher to student. In contrast, students in the social studies and language arts lessons were already positioned into roles as experts, where knowledge could flow in the opposite direction, from expert student to peer students and teacher (Gardner and Toope 2011; Murray and Klinger 2013; Walqui and van Lier 2010). In such cases, expert students' impromptu use of reflection discourse involving the linguistic features of Evaluation (e.g. Evaluation lexis, sensing processes, consequential and causal conjunction, etc.) flourished without needing teacher intervention at the time of their presentation; whereas students' use of Evaluation discourse – and their willingness to position themselves into an persuasive expert role – in science and math classes was less frequent and much less robust.

With the new US national standards (CCSS), and similar international efforts to integrate language-and-content learning (Llinares and Pastrana 2013; Llinares and Pena 2015), language arts teachers are now not the only teachers expected to teach their students persuasion; rather, this is now the job of teachers across the curriculum (Gottlieb 2016). To persuade in essence is to offer a particular option or viewpoint (Choice) and then to subsequently justify this choice (Evaluation) to listeners and readers. Choice and Evaluation, according to Mohan (1986, 2007), are KSs that convey persuasive discourse. As shown in this data, mathematical and social studies' tasks enacted by students pushed them to justify and to persuade. In mathematics, the new national standards require students to justify their choice of problem-solving methods and solutions (Huang and Normandia 2008). In social studies, students being prepared to engage in democratic practices, can orally debate sometimes comparing different historical viewpoints to support their own point of view (Fang and Schleppegrell 2008).

Choice and Evaluation are used frequently in the real world, where students will need to convince people of their viewpoints and persuade them to act on the information. To participate in democratic practices or in the business world, students will need to be engaged in the social practices involving Choice and Evaluation. To empower such learners to fight for their own rights, Choice/Evaluation language is instrumental, as this action/reflection pair enables a person to persuade and justify. However, in two of the four classroom situations showcased here, students struggled to express Choice and Evaluation. In fact, putting together all three sections of classroom interaction as shown in Examples 2, 3, and 4, one can see it builds a solid piece of discourse of Choice AND

Evaluation. However, similar to the findings by Huang, Normandia, and Green (2005), our data show that the language of Evaluation is mainly generated from the teacher. Huang, Normandia, and Green (2005) argue that instructional design should systematically integrate thinking and talking to foster students' discourse associated specifically with higher-level KSs, such as Principles and Evaluation.

Research on classroom discourse has revealed that teachers expect students to use Evaluation language to support Choice, but they do not necessarily explicitly teach students the linguistic resources of Evaluation (Gleason and Schmitt 2015; Huang, Normandia, and Green 2005). Considering teachers' tendency to take over the task to use the language of Evaluation, we may need to further look into the interrelatedness of language and thought (Vygotsky 1978). While thoughts/ideas may serve as the motivation for use of language, research has also shown language can also function as stimulus to construct knowledge. In other words, when a child is prompted to use the word *because*, the child is more likely to use language of justification to construct Evaluation discourse (Huang 1996). Thus, the knowledge of linguistic features salient for Evaluation discourse becomes crucial if teachers are to use language as a tool to facilitate learning and knowledge construction. The challenge for classroom teachers is how to intentionally design instructional activities that can lead to student use of Evaluative language, especially in those content area classrooms where student positioning as experts is less prevalent.

Even though the teachers in our study were not using the KF for instructional design purposes, our data analysis demonstrates the power of the KF to reveal the specific linguistic features utilized to realize the KSs of Choice and Evaluation in four different school disciplines. Also, our findings reveal the use of linguistic resources for semantic relations in the KS of Evaluation. Mohan (2007) revealed that the conjunctions used to realize Evaluation were mainly comparative. Similarly, Schleppegrell (1996) showed that *because* is often used in casual conversation in very different ways than it is used in formal academic writing. In our data analysis, conjunctions (causal, consequential, and conditional) were also utilized. This usage is logical given that Evaluation often relies on the articulation of Principles that frequently requires the employment of causal, consequential, and conditional conjunctions as well.

A wealth of research points to the importance of integrated language-and-content instruction (de Oliviera 2016; Gibbons 2015; Hammond 2006; Mohan 1986). Scaffolding language in classroom instruction can facilitate – or even drive – meaning construction by students. If teachers provide the linguistic tools of Choice and Evaluation to students, students will be forced to think using these same structures; after all language is a tool for thought (Vygotsky 1978). Thus, we are advocating that teachers be apprenticed into and explicitly educated in the language and social practice of Choice and Evaluation in order to scaffold their own students' ability to persuade, convince, and justify their viewpoints.

## Conclusion

The importance of students talking as experts so as to have a better chance to produce the language of Evaluation should not be underestimated. This indicates the importance of students feeling like experts (Gardner and Toope 2011). Our study shows that students are less likely to use the language of Evaluation (e.g. Evaluation lexis, sensing processes, consequential and causal conjunction, etc.) when they do not feel like, or they are not given the hat of, an expert. The lack of student-as-expert discourse (i.e. student use of

Evaluation language) points to a need for teachers to design and offer instruction in such a way that pushes students to assume an expert role (Murray and Klinger 2013). Teachers need to intentionally build such explicit language opportunities into their day-to-day lessons, building it over time with students (e.g. modeling 'group work language'), passing the baton to students, and expecting that the students can/will take it up (Gibbons 2015, 75).

Although our study focuses on limited samples, the findings suggest possible patterns of linguistic features used to realize Choice and Evaluation by students and teachers in different school subject areas. On their own, students may not be able to generalize their practical hands-on experiences to the theoretical scenarios. The practical implications of our study point to the need for students to be provided with opportunities to become familiarized with the topic, thus making them more willing to engage in reflective discourse and to position themselves into expert roles (Walqui and van Lier 2010).

Even when students already have a sense of being an expert, it does not mean that they will use language to construct Evaluation discourse, generalizing their practical hands-on experience to theoretical scenarios. Research on the TLC has emphasized the importance of building students' field knowledge early on in a lesson, first building their knowledge of field and later deconstructing the language of Evaluation. Mohan (2007) revealed several important linguistic features associated with Evaluation. Our study builds on these original features, going beyond comparative conjunction (e.g. *however, while*) to include consequential (e.g. *since, consequently*) and conditional conjunction (e.g. *if…then*). Thus, the findings of linguistic features in our study could be used as a springboard for teachers to elicit literate classroom talk in an intentional way. One idea would be to help teachers understand the functions of language within their disciplines using the TLC to construct the oral genres involving Choice and Evaluation KS specifically. Teachers could deconstruct genres involving Choice and Evaluation with students orally and then co-construct them orally with them, guiding students toward independent construction of the Choice and Evaluation KSs.

A linguistically scaffolded experience within disciplinary ideas is necessary for students to become expert thinkers and speakers in these content areas. Content-area teachers in secondary disciplines need training to be able to recognize the language demands of their disciplines, and to explicitly focus on language in context, scaffolding the types of oral language needed for their students to become experts. It is essential to include curricular content that is both stimulating while at the same time highly supportive of language development (Gibbons 2009). Nonetheless, even with superior teacher professional development, we must also recognize that it will take time for students to acquire life experiences that activate abstract disciplinary principles. Teachers must consider what is developmentally appropriate for learners, especially considering the high pressure environments in which they and their students now work; they must continue to spiral concepts through the curriculum, connecting instructional discourse on new material to previous material and ideas.

Admittedly, our study has inconsistencies in the contexts it explores. Furthermore, it provides only a small sample of student oral discourse. Nevertheless, considering the limited research on this topic and it importance, we believe that it can lead to more inquiries that will continue to throw light on oral patterns of language-and-content-integrated classroom discourse. Given this, as well as individual differences among teachers, it will

be important to validate this exploratory research with a more substantial study that investigates analyses across subjects. Such research will surely encourage researchers and classroom educators to further explore ways to approach instruction that promote student talk at higher cognitive levels.

## Note

1. All names used here are pseudonyms and do not necessarily reflect the cultural or ethnic heritage of those individuals.

## Disclosure statement

No potential conflict of interest was reported by the authors.

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