TEACHING LINGUISTICS

Linguistics in middle school: Incorporating linguistics into project-based learning

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This article argues that linguistics can be effectively incorporated into project-based learning (PBL) as an innovative approach to introducing young students to linguistics. It draws from eighteen months of a collaboration between a linguist and a middle-school humanities teacher, and builds on prior efforts by linguists to incorporate linguistics into the K–12 curriculum. The article reviews relevant literature, introduces PBL and linguistics in PBL as a model, and presents detailed descriptions of how the study of language and the linguist’s ways of knowing were incorporated into two student projects. Evidence of student learning and the impact of linguistics is also presented. The article concludes by suggesting that this approach to incorporating linguistics into K–12 education can address the goals both of linguists—changing attitudes toward and understanding of language—and of educators—improving academic performance and addressing content standards.*

Keywords: linguistics, K–12 education, project-based learning, middle-school linguistics

1. Introduction. Linguistics should play a significant role in primary and secondary education, particularly as the widely adopted Common Core State Standards (CCSS) have an entire strand titled ‘Language’ within the standards for English Language Arts and Literacy. This presents an opportunity for linguistically informed curricula to be widely used in classrooms to further the goals of educators, linguists, and administrators alike (Denham 2015). However, linguistics has traditionally been a higher-education discipline. Nonlinguists do not have a clear understanding of what linguistics is, its potential applications, or how to utilize it to meet the standards (much less how to use it as a teaching tool for new learners). Despite content standards that invoke linguistic concepts, with some exceptions, linguists are generally involved in teacher-preparation programs only in delivering generic courses in the form of an introduction to linguistics or English grammar and syntax (Denham 2010, Lord & Klein 2010, Fillmore & Snow 2018). The lack of linguist involvement in designing curricula to address the core skill sets that practicing teachers need means that there are too few linguists who can engage the question of how linguistic understanding can make the impact that it should on students and educators.

This article contributes to the current body of work on linguistics in education (Honda, O’Neil, & Pippin 2004, 2010, Denham & Lobeck 2010, Ginsberg, Honda, & O’Neil 2011, Loosen 2014, among others) by presenting a model for incorporating linguistics into project-based learning (PBL) as an additional and innovative way to introduce students to the study of language during the primary and secondary grades. The article also models the importance of incorporating linguistics into an existing curriculum in a way that suits the pedagogical approaches of the school—PBL in this case. PBL is a teaching method via which students learn content and acquire skills by engaging...
ing in extended inquiry as they address a real question or challenge, or attempt to solve a problem (Buck Institute for Education (BIE), Dewey 1959, Krajcik et al. 1998, Moje et al. 2004, Krajcik & Blumenfeld 2006). As schools throughout the United States respond to the Common Core State Standards—which emphasize critical thinking, problem solving, collaboration, and inquiry (Boss & Kraus 2014)—by adopting more evidence-based pedagogical practices, including PBL (Troia & Olinghouse 2013, Ellison 2015), an exploration of ways that linguistics can be incorporated into student projects and existing curricula can be beneficial both to the students and to the field of linguistics by making the material immediately relevant and memorable.

As described in detail in §2, most of the linguistics work in K–12 to date has placed it primarily as a separate area of study in the curriculum, either as an elective course or as an additional component (Fabb 1985, Honda 1994, Honda, O’Neil, & Pippin 2004, Reaser, Adger, & Hoyle 2005, Reaser & Wolfram 2007, Ginsberg, Honda, & O’Neil 2011, Loosen 2014, Hudgens Henderson 2016). This work has been positively received by students and teachers alike, yet most teachers are still not incorporating such curricula in their classrooms. The necessity of introducing young students to the linguist’s ways of learning about language and its significance has been recognized by a growing number of academics, and linguists have a standing call to action to establish partnerships with teachers and to ensure that prospective teachers in linguistics courses understand the role of linguistics in education (Denham 2010, Lobeck 2010, Peng & Ann 2010, Reaser 2010, Sweetland 2010). As a linguist and educator of prospective teachers, part of my impetus for the work described in this article is responding to this call to make linguistics better known outside academia and to shape linguistics courses for prospective teachers in ways that translate linguistics into classroom practice. Another impetus is a response to the welcome shift that academia has experienced over the past two decades, as universities and national organizations that support them place an ever-growing importance on meaningful research and knowledge arising from faculty-community partnerships because of the mutual benefit promised by such collaborations (Boyer 1996). The model of linguistics in PBL described here arose through a multiyear COMMUNITY-ENGAGED SCHOLARSHIP (CES) project and relies on collaboration between educators and linguists, a bottom-up approach, and ELASTIC THINKING (Mlodinow 2018). This model was not designed and then implemented, but rather emerged from an extended collaboration between a linguist and a middle-school humanities teacher, and from our work with two groups of eighth-grade students over the course of two academic years.

Two specific projects and the impact of linguistic study on student learning are discussed in this article. In the first project, students were introduced to linguistic diversity and the ways in which one’s linguistic behavior affects others, such as how speaking nonstandard dialects can impact both the speaker and the hearer, as they conducted a larger project on the effects of human behavior on the environment. In the second, students investigated patterns in the night sky, their role in various cultures throughout history, and what it means to appreciate and respect other cultures. Understanding what language is and the connection between language and culture became crucial to this project, and linguistics activities played a significant role in the students’ learning about linguistic diversity, language maintenance and loss, and the interconnectedness of language, culture, and identity. The degree to which linguistics was integrated into PBL varied from one project to the next, suggesting that adopting this model allows the inte-

1 ‘What is PBL?’; https://www.pblworks.org/what-is-pbl
The article is organized as follows. I first offer a review of the literature on linguistics and education, including current efforts to incorporate linguistics into the K–12 curriculum (§2). Section 3 defines PBL, outlines the model of linguistics in PBL, and explains how this approach is beneficial both to the students and to the discipline of linguistics by describing two projects in detail. Concluding remarks and thoughts for future directions are provided in §4.

2. Linguistics and K–12 education. The value of a linguistically informed K–12 curriculum has been recognized by linguists and a smaller number of K–12 educators for more than half a century, yet the vast majority of primary- and secondary-school students are never introduced to linguistics at any point in their precollege education. This is partly the result of linguists being absent from the cadre establishing curriculum standards and of nonlinguists viewing language differently than linguists do; thus, state and national standards position the value of language awareness and linguistic diversity, for example, only in the context of teaching standard English (Reaser 2010). The pressures teachers face from high-stakes standardized testing and a lack of appropriate standards-based linguistically informed materials (Reaser 2010) also contribute to the absence of linguistics in K–12 education. Nevertheless, as challenging as this situation might seem, more work is now being done in this area of linguistics than at any previous time. More linguists are involved in collaborations and partnerships with teachers (following on the pioneering work of David Pippin’s collaboration with Maya Honda and Wayne O’Neil described in their various works further referenced below; Denham 2010, Lobeck 2010, Peng & Ann 2010, Trousdale, Anderson, & Sangster 2018); curricula are being developed to be used by teachers with or without a background in linguistics (Reaser, Adger, & Hoyle 2005, Reaser & Adger 2007, Reaser & Wolfram 2007, Brown 2009, Hudgens Henderson 2016); and linguists are researching teacher attitudes toward language and best practices for teaching a linguistically diverse classroom (Akkari & Loomis 1998, Godley et al. 2006, Ginsberg, Honda, & O’Neil 2011, Fan 2013, Godley, Reaser, & Moore 2015, Mallinson & Charity Hudley 2018) and developing materials and coursework for preservice teachers (Denham 2010, Lobeck 2010).

This work is diverse and has the goals of both improving student academic achievement and raising awareness of and developing an appreciation for linguistic diversity. As described below, the work of linguists in K–12 education has covered two main themes: (i) language variation awareness for students and teachers alike, with the goal of reducing negative attitudes toward nonstandard dialects and promoting appreciation of linguistic diversity (themes that fit within social-studies curricula), and (ii) the role of linguistic inquiry in improving academic achievement, in both science and other fields. These two main themes can be further divided into the following areas, with considerable overlap between them: socio linguistics; bilingualism and bilingual education; linguistic inquiry and science education; linguistically informed curriculum development; the role of linguistics in teacher education; and other linguistics activities conducted
with young people, both inside and outside the classroom. These main themes and their interconnections are discussed further below.

As language prejudice has been and remains a still socially acceptable form of overt discrimination, sociolinguists have long recognized the importance of introducing young students to the study of language in order for them to develop an awareness of language variation and to appreciate the value of linguistic diversity. This work is of critical importance for speakers of dialects that are closer to the standard, and perhaps even more important for speakers of dialects that are further from the standard, who often view their own speech as deficient (Perry & Delpit 1998). Early pioneers of this work were Labov (1972a [1969], 1972b) and Wolfram (1969), who focused on African American English, describing it as a ‘logical’ nonstandard dialect and calling attention to the links between social status and linguistic differences. African American English (AAE) remains one of the most stigmatized dialects spoken in the United States, with negative views, including those of teachers, deeply entrenched in American culture. Many researchers have addressed AAE and its role as a barrier to higher academic achievement: what is measured via testing is the standard dialect, but AAE users speak a different dialect. In the late 1990s, the Ebonics debate in California surrounding the decision by the Oakland School District to recognize African American Vernacular English (AAVE) as the dialect of some of its students and to use it to teach the standard generated many publications addressing the issue from a linguistics perspective. Pullum (1999) wrote about AAVE not being Standard English with mistakes. Rickford (1999a,b) presented remarks arguing for the benefits of using the students’ vernacular to teach the standard dialect, and Rickford and Rickford (2009) drew on a decade of work with teachers in Northern California to describe the role of AAVE for elementary teachers.

Recent work on issues related to this speech variety has focused on raising awareness about its history and significance to both African Americans and the speech and culture of the United States (see e.g. the 2017 documentary Talking Black in America²) and on using this dialect to teach the standard via a critical-awareness approach, contrastive analysis, and code-switching (Siegel 2006, Wheeler & Swords 2006, Mayer & New 2010, Wheeler 2010). Sweetland (2006) conducted interviews with teachers and elementary students, collected language-attitude survey data from both students and teachers, and analyzed pre- and postintervention writing samples from students. She found positive correlations between dialect-awareness training and both teacher attitudes toward the speech of their students and student attitudes toward their own learning and academic performance. Wheeler and Swords, a linguist and an urban elementary teacher, respectively, worked together using a contrastive-analysis approach and code-switching to help students add Standard English to their repertoire as another ‘linguistic code’, instead of viewing their own dialect as ‘wrong’ (Wheeler & Swords 2006, Wheeler 2010). The importance of other nonstandard dialects and of indigenous languages has also been addressed (Philips 1972, Williams 2011). Particularly notable is the work of Reaser, Wolfram, and colleagues in designing a linguistically informed standards-based sociolinguistics curriculum specifically for North Carolina. Using videos and carefully designed lessons targeting social-studies curriculum standards for eighth grade in North Carolina, Reaser and Wolfram (2007) created a curriculum that can be used by teachers with or without a background in linguistics (see also Reaser 2010). Social-studies teachers have been receptive to curricula such as this, likely because they deal with real social issues and draw students in. A high-school curriculum on dialect awareness has also been de-

² Produced by Neal Hutcheson and Danica Cullinan, executive producer Walt Wolfram. Raleigh, NC: The Language and Life Project, North Carolina State University.
signed around the Public Broadcasting Service (PBS) documentary *Do you speak American?*, with accompanying vignettes publicly available (Reaser, Adger, & Hoyle 2005, Reaser & Adger 2007; see also Reaser et al. 2017, which presents research-based approaches to accommodating different dialects in school).

In addition to work addressing dialect-based inequities in education, researchers have also focused on bilingualism and bilingual education, and the role that linguistic inquiry plays in educating emergent bilinguals whose first language is not English. In her dissertation, Hudgens Henderson (2016) presents the results of using sociolinguistic-awareness lessons specifically designed for English language learners in a dual language program (Spanish–English). She finds that the students who participated in the linguistically informed curriculum improved their language attitudes and sociolinguistics knowledge, and she concludes that all students can benefit from learning through such curricula. At the high-school level, Ginsberg, Honda, and O’Neil (2011) used linguistic inquiry in an ESL (English as a second language) classroom, where students investigated both their own home languages and English, and as a result gained linguistic knowledge, changed their beliefs about language, and validated their own languages in an otherwise English-dominant context.

Using linguistic inquiry as a window onto scientific investigation has been the other major theme addressed by linguists in the schools. Most notable in this area is the work of Maya Honda, Wayne O’Neil, and David Pippin starting in the early 1990s, though others had also introduced linguistics to young children in schools by that time. Fabb (1985), for example, had worked with elementary-school students over a period of six months, doing biweekly linguistics lessons covering speech sounds, morphology, and syntax. Honda, O’Neil, and Pippin (two university linguists and a teacher, respectively) collaborated on numerous efforts to develop students’ linguistic literacy and use linguistics as a window onto scientific thinking (Honda & O’Neil 1993, Honda 1994, Honda, O’Neil, & Pippin 2004, 2010, Honda & O’Neil 2008). This work presents activities through which students are introduced to the scientific study of language via problem sets, inviting them to see language as data that can be observed, hypothesized about, and tested. Similar to this type of work, other linguists in partnership with teachers have used linguistic-inquiry approaches to help students improve their writing or understand the complexities of narrative texts (Trousdale, Anderson, & Sangster 2018, in Scotland) and have introduced young children to linguistics during day camps (Farris-Trimble & Reid 2018). Brown (2009), a former high-school teacher, wrote a linguistically informed curriculum designed to introduce adolescent students to linguistic diversity and help them improve their academic writing by understanding how English works—more specifically, how different Englishes work. The text offers lessons on teaching grammar, the role of code-switching, and the structure of academic writing, and it can be used and adapted by nonlinguists.

Designing linguistically informed curricula that can be used by teachers requires much of linguists and teachers alike, and the curricula that already exist are not as widely used as one would hope. This could be due, in part, to the fact that most existing materials still require additional work on the part of teachers since they are not explicitly aligned with state standards. The *Voices of North Carolina* curriculum for eighth graders by Reaser and Wolfram (2007) is aligned with the curriculum in NC, but standards also change periodically, and materials need to be updated. Linguists therefore need to work closely with K–12 teachers, who are experts in K–12 teaching and can provide valuable insights to the linguist (Lobeck 2010, Reaser 2010). A challenge presents itself for linguists in this respect, as work of this kind has generally not been fa-
Tоворably recognized by promotion and tenure processes (Hall 2002); thus linguists have usually focused their efforts elsewhere.

Fortunately, at this time there is a renewed interest in linguistics in K–12 education, as demonstrated by this very section in Language, by the recent (February 2018) decision to offer K–12 students and teachers complimentary membership in the Linguistic Society of America (LSA), and by the charge that the LSA has given its committees and these committees’ active agendas. A growing number of linguists now serve on the Language in the School Curriculum Committee and the AP Linguistics Committee (Advanced Placement), aiming to equip teachers with the requisite skills and knowledge to introduce linguistics to primary and secondary students, and to eventually offer an AP linguistics course. There is also a (slowly) growing social media community of teachers and linguists working toward including linguistics in the secondary curriculum. High School Teachers Incorporating Linguistics and AP Linguistics are two social media (Facebook) communities, both created by Suzanne Loosen in February 2017; at the time of this writing, they have sixty-three members and 130 members, respectively. Both groups include some of the linguists mentioned above (David Pippin, Anne Lobeck, Kristin Denham), as well as other middle- and high-school teachers who use linguistics (such as Suzanne Loosen, Beth Keyser, and Ian Connally). The members of these groups either teach elective linguistics courses at their high schools (see Loosen 2014 for an in-depth description of her course), are trying to make linguistics an AP course (a multiyear process), or are otherwise incorporating linguistics into the curriculum, as well as encouraging students to participate in linguistics olympiads. While it is not clear how many members of these groups are actively doing linguistics with their students, there is clearly a growing interest in doing so on the part of both teachers and linguists. However, it is also clear that this community is not very large, considering how many schools there are in the United States.

The work presented in this article builds upon this prior body of work as it responds both to the call for linguists to establish partnerships with K–12 educators and to the shift within institutions of higher education toward CES, which has been identified as one of the core missions of higher education over the past two decades (Boyer 1996, Gelmon et al. 2013). The model of linguistics in PBL thus arose from an extended CES collaboration between a linguist and a middle-school humanities teacher in California. How exactly CES is defined is still a matter of debate (Sandmann 2008, Bateman 2018), but most accepted definitions emphasize the critical role of the community partner in shaping the work of the partnership. Following this framework, the present collaboration intentionally began without a preplanned agenda, so as to avoid the parachute approach to research to which many public school teachers are accustomed, in which academics come into the school solely to conduct their research (Bateman 2018). The intention was to make it clear that the goal was a mutually beneficial partnership. The community partner would benefit from being introduced to alternative ways of looking at language (linguistic inquiry), while the university partner (teaching prospective teachers) would benefit from having a window onto what secondary students and their teachers need in the classroom.

The partner school in this study is High Tech Middle North County, a Title I public charter school in North San Diego County, educating a relatively small (about 350 students) but highly diverse student population (per the US Department of Education, a

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3 List of standing LSA committees, including the AP Linguistics Committee and the Language in the School Curriculum Committee: https://www.linguisticsociety.org/about/who-we-are/committees
Title I school enrolls at least 40% of its students from low-income families). Since it is a public school, students must meet the same standards as in other schools, though teachers have the freedom to design their own curriculum. The classroom structure is organized around teams: each grade level has two teams of fifty-four to fifty-six students each, and each team is led by a humanities teacher and a science-math teacher. In addition, students take two different arts over the course of the year, Digital Arts and Maker Space, with different instructors. All instructors collaborate closely in the design of student projects, identifying the essential questions to be answered and the desired outcomes, but students do the research and solve the problem(s) or answer the question(s). The students on each team are further divided into two groups, each rotating between the different teachers on the team, and sometimes also converging as a large class. The partnering team co-taught language and linguistics weekly to one student team each year for the duration of the partnership (ongoing at the time of this writing). As the school already utilizes PBL as its main pedagogical approach, the challenge became incorporating linguistics into this model—the topic of the next section.

3. Project-based learning and linguistics in PBL. Project-based learning is a student-centered method of teaching through which students acquire content and process skills by conducting authentic work and engaging in extended periods of inquiry around a particular problem or question (BIE, Dewey 1959, Krajcik et al. 1998, Moje et al. 2004, Krajcik & Blumenfeld 2006). For example, through a project about climate change in which students seek to answer questions such as what could be done to lessen human impact on the environment, students may learn about the science of ocean acidification; interview experts and write about what they have learned; create recycled art; produce public service announcements, posters, or presentations to share their knowledge; and engage in some specific act to reduce waste, such as recycling, beach clean-up, or raising funds to install a water-bottle refilling station at their school (which actually happened at the middle school that is the community partner in the current article).

PBL utilizes essential design elements including key knowledge, understanding, and skills, a challenging problem or question, sustained inquiry, authenticity, student voice and choice, reflection, critique and revision, and a public product (BIE). This means that students are challenged to learn in order to do something, rather than learning to remember something; they are also encouraged to make some decisions about the project, such as ‘how they work and what they create’ (BIE). Furthermore, both students and teachers reflect on the effectiveness of the project activities, on their learning, and on overcoming obstacles. This also means that projects can change as a result of student learning and reflection, as teachers respond appropriately in order to assist students toward success.

The PBL approach to teaching is sometimes viewed as superior to traditional teaching methods in which students are seen as recipients of knowledge. Research shows that PBL results in deeper learning and understanding, and also gives real-world relevance to the content, thus making it memorable in the long term. In her review of seventeen peer-reviewed articles that evaluated the effectiveness of PBL as compared to tradi-

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4 Title I school information from the US Department of Education website: https://www2.ed.gov/programs/titleiparta/index.html
5 https://www.bie.org/
6 ‘Gold standard PBL: Essential project design elements’; https://www.pblworks.org/what-is-pbl/gold-standard-project-design
Holm (2011:8) found that ‘students in project-based classrooms exhibited greater gains in content knowledge than their traditionally taught peers’ and that students in these classrooms also exhibited ‘greater engagement with’ and ‘improved perceptions of the subject matter’ (see Holm 2011 for a detailed review of the benefits of PBL).

Incorporating linguistics into PBL represents a new way to think about linguistics in the school curriculum. With more schools adopting PBL, and with student projects not generally being about language, integrating linguistics into PBL becomes the locus for creative work, flexibility, and innovation, as different projects lead to different levels of connection with linguistics. As described in the next two subsections, in some projects the link between linguistics and the student project is tangential though still related, while in others linguistics is an integral component. It is also important to recognize that being creative in integrating linguistics into student projects and making connections to existing curricular goals does not have to be limited to schools that have adopted PBL as their core pedagogical approach. Finding the connections is the most important factor, and this relies on genuine collaboration between linguists and teachers and on their mutual understanding of each other’s work—a significant part of CES and a general good practice when working in partnership with others.

### 3.1. Linguistics in PBL as a Model

The basic premise of this model is that linguistics can be linked to every student project, along a continuum. In some projects, linguistics activities may have a parallel connection, encouraging students to expand their thinking and apply their understanding to different content domains. In others, linguistics activities may be essential. From one end of the continuum to the other, as long as the links between linguistics and the project are clearly made, students will learn from linguistics. In Table 1 I provide a few examples of projects that have actually been conducted at various schools and suggest ways that linguistics could be integrated into these projects.

As Table 1 shows, it is possible to integrate linguistics into every project: more deeply in some, less so in others. Existing curricula (such as lesson plans on the Western Washington University website, in Reaser, Adger, & Hoyle 2005, Reaser & Wolfram 2007, Honda & O’Neil 2008, and Brown 2009) or new curricula designed to align with state standards (Reaser & Wolfram 2007, Reaser 2010) can be used to teach young students about the science of language and the role that language plays in society. In this way, teachers can incorporate linguistics into PBL regardless of whether the project has a stronger humanities or STEM emphasis. Furthermore, if more linguists develop partnerships with teachers and become involved in teaching linguistics to young students and developing appropriate materials that are standards-based, teachers can then use these materials without needing a background in linguistics and without a linguist in the classroom (Denham 2010, Reaser 2010). The issue is one of scalability, but the overall goal can be accomplished by collaborating with practicing teachers, developing curricula as mentioned above, and working with prospective teachers to ensure that they will use linguistically informed curricula when they teach their own students. Lord and Klein (2010) offer further suggestions for how linguists can become involved in influencing the education of young students, including being mentors to new teachers and forming collaborations with education faculty on their own campuses. It may be that teaching linguistics as a separate subject is not yet possible in middle school, but in the

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7 Western Washington University linguistics lesson plans and resources: https://teachling.wwu.edu/
absence of a separate course or a separate curriculum component, linguistics can be taught by integrating it into other student projects.

The next two sections describe in detail two projects from the first eighteen months of the collaborative partnership. The first is a primarily science-focused project titled ‘The ripple effect’, in which students investigated and learned about the effects of their actions on the environment and the future of the planet. At the same time, they read *To kill a mockingbird* (by Harper Lee) for humanities, which was not necessarily connected to their larger project. While a language connection may not be immediately obvious for such a project, when coupled with their reading of Lee’s book the connections become clear. This project presented opportunities for students to become engaged in a series of investigations of human linguistic behavior and its ‘ripple effects’ on the self and others. While these activities were not entrenched in the project, they provided enough points of connection that the study of language became more relevant and engaging for students. The second project, described in §3.3, ‘The stars and stories project’, undertaken with a different group of eighth graders, lent itself to a much deeper and more meaningful connection with linguistics. Language was an important element

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**Table 1. PBL projects and how linguistics could be integrated.**

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<thead>
<tr>
<th>Project Title and Essential Questions</th>
<th>Possible Integration of Linguistics</th>
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| **Homeless in America: Exploring homelessness and the people who seek to end it**  
Essential questions:  
• How can we end homelessness in America?  
• What is the face of homelessness in America?  
• What can/should citizens and community members do about homelessness? | • Exploring stereotypes about homeless people and establishing links to stereotypes about language and language users  
• What is the future of languages that are not official, that don’t have a place? How might they change?  
• Linguistics lessons on systematic differences between language varieties  
• Linguistics lessons on language change |
| **Chaos or community: Learning to listen. How dialogue can save us all**  
Essential questions:  
• What happens when we listen well? What happens when we don’t?  
• How do members of a community create healing after conflict?  
• How can we be agents of positive change? | • Discussions about what language is and what people listen to  
• Studies in morphology, syntax, semantics, and pragmatics (what words are and what it means to know words; word structure; sentence structure; using different structures—e.g. passives—to accomplish certain goals)  
• Lessons around Grice’s maxims, idioms, metaphor, positive and negative politeness  
• Power of language (to tear down or build up); who has power? |
| **The human food chain**  
Description: In this project, students will be learning about our food systems from ground to ground. Students will be exploring how we grow/manufacture our food, package it, ship it, buy it, consume it, and dispose of it. Students will learn what our bodies need in order to grow and function and the effects of certain types of food on them. Students will also be tracing back the political and economic impacts of your food choices. | • Exploring food-naming practices and manufacturers’ ways of labeling foods  
• Lessons in morphology and semantics, as well as phonetics and phonology for foods that have names where the sound matters  
• Comparisons between food intake and ‘nourishing’ conversations: discussions of different genres of speech, some nourishing (e.g. thank you notes) and some not (e.g. gossip) |

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8 Project descriptions from https://www.hightechhigh.org/student-work/student-projects/  
9 ‘The ripple effect’ project website: https://rippleeffectproject.weebly.com/
in this project, as students explored humanity’s and Earth’s place in the universe and learned about astronomy and the role that stars have played in human cultures, and about the close relationship between language and culture. Incorporating linguistics into PBL has been illuminating for the university and community partners as teachers and beneficial for students, who have gained an appreciation for language and linguistic diversity, as expressed in their reflections and assignments used to assess learning. In accordance with PBL methodology, linguistics activities were adapted and reimagined in response to student learning and engagement, as teachers assisted students toward success.

Given what research has shown about the effectiveness of PBL (Holm 2011), this approach to incorporating linguistics into the school curriculum is hypothesized to accomplish two things: (i) students will see the relevance of the scientific study of language more readily and become interested and engaged in language-related issues, and (ii) more teachers may try to incorporate linguistics into their curriculum if they do not see it as taking additional time from their day but rather as a beneficial component of a project that also meets state standards. The work described below presents some evidence in support of (i), in the form of student reflections and debriefings with teachers. The second point remains an open question for future research.

3.2. Linguistics in PBL: linguistic diversity and the significance of speaking differently. The first project integrating linguistics into PBL involved linking it to ‘The ripple effect’ project mentioned above. In keeping with the theme of the project, the linguistics unit was framed around the following questions: In what ways do people speak differently? Does the way you speak affect what others think of you? Does the way others speak affect what you think of them? To address these questions, students were introduced to sociolinguistics via various activities, as described in Table 2, although the implementation of these activities was somewhat different from expected, as discussed below. This unit spanned four one-hour sessions on the topics of standard English and nonstandard dialects, English accents, and foreign accents.

The ‘Who am I?’ activity was initially designed to demonstrate students’ knowledge of register, as a precursor to introducing dialects, but it became an introduction to linguistic stereotypes, which greatly influence how people view and treat each other. Students worked in groups, and each had one of the following written on a mailing label taped to their forehead: a toddler, a French chef, a Southern chef, a crocodile wrangler, an elderly grandmother, a Texas cowboy, a New York street vendor, and a British gentleman. The students did not know what their own label said, and they were instructed to speak to each other in a way that would help their interlocutor figure out who they were.10 The students were pretty quick to recognize the way they were speaking as representing mostly stereotypes: the French chef was addressed using a French accent, the crocodile wrangler was addressed in the students’ best attempt at an Australian accent, and so forth. The activity itself was engaging for the students, but more importantly it provided a good way to introduce the topic of language variation and the distinction between accents and dialects. Students also viewed video excerpts from American tongues and YouTube videos illustrating different accents and lexical differences, which helped to further clarify these concepts. Bilingual students were eager to share their experiences with speak-

10 In subsequent iterations of this activity, the roles were reversed: each student was given a label, but they did not share it with the rest of the group. Instead, they were to speak as though they were that person and the group had to guess who they were. The result was the same, leading to a discussion about linguistic stereotypes, but it was a more effective way to engage students in the activity.
Students also took the *New York Times* dialect quiz,¹¹ both for their enjoyment and for a further opportunity to discuss dialects. Some were concerned that they would get the answers wrong, a concern that lent itself to a productive discussion about standard and nonstandard dialects, correctness, and the ways in which dialects differ (lexically, grammatically). To help students better connect this topic to their own experiences, they were asked whether they believed that the students at their school had a different dialect from students at other schools. Students were pretty quick to answer ‘yes’ and offered school-specific terminology as evidence: PBL (project-based learning), SLC (student-led conferences), POL (presentations of learning). A discussion distinguishing jargon from dialect followed, and students agreed that the school represented a community and

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<th>ACTIVITY</th>
<th>WHAT IT ACCOMPLISHES</th>
<th>RIPPLE EFFECT CONNECTION</th>
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<tbody>
<tr>
<td>‘Who am I?’: Each student has a piece of paper with a description written on it taped to their forehead (e.g. toddler, friend, etc.). Taking turns, students talk to each other in the way they would address someone in that role, and the student has to guess who that is.</td>
<td>Demonstrates knowledge of different ways of speaking, socially appropriate ways of speaking, etc.; also primes students for introduction to dialects.</td>
<td>How we perceive others influences how we talk to them.</td>
</tr>
<tr>
<td>Watch and discuss videos about different dialects; discuss regional and social dialects</td>
<td>Students become aware (or increase their awareness) of different dialects of English; some dialects are associated with different regions, others with groups of people (e.g. African American English; Chicano English). Standard English is also a dialect, but it is the one that is understood by everyone and that is preferred in school, business, etc.</td>
<td>Ask students to consider how speaking a dialect that is different from the standard can have an effect on the speaker and on others as well.</td>
</tr>
<tr>
<td>Take dialect quiz</td>
<td>Analytical skills; helps students view patterns in different dialects</td>
<td>Why did the author use the different dialects? What did she accomplish by doing so? Would it have been different if she had used standard English?</td>
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Dialect comparisons—students analyze excerpts from *To kill a mockingbird* where characters speak in their own dialects and compare them with Standard English; are there any patterns they can identify in either dialect?

| • Watch and discuss videos about different dialects; discuss regional and social dialects | Students become aware (or increase their awareness) of different dialects of English; some dialects are associated with different regions, others with groups of people (e.g. African American English; Chicano English). Standard English is also a dialect, but it is the one that is understood by everyone and that is preferred in school, business, etc. | Ask students to consider how speaking a dialect that is different from the standard can have an effect on the speaker and on others as well. |
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Table 2. Activities connecting linguistics to ‘The ripple effect’ project.

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ing their heritage languages with an English accent and having relatives comment on that during visits.

Students also took the *New York Times* dialect quiz,¹¹ both for their enjoyment and for a further opportunity to discuss dialects. Some were concerned that they would get the answers wrong, a concern that lent itself to a productive discussion about standard and nonstandard dialects, correctness, and the ways in which dialects differ (lexically, grammatically). To help students better connect this topic to their own experiences, they were asked whether they believed that the students at their school had a different dialect from students at other schools. Students were pretty quick to answer ‘yes’ and offered school-specific terminology as evidence: PBL (project-based learning), SLC (student-led conferences), POL (presentations of learning). A discussion distinguishing jargon from dialect followed, and students agreed that the school represented a community and
that each community the students belonged to had its own way of using language. Students identified communities such as their family, group of friends, their team (classroom), the entire eighth grade (both teams), their school, their city, the county. One student offered ‘yourself’ as a community, meaning that individuals also have their own ways of talking, which led to a brief discussion of idiolects. By the end of this discussion, students had a clearer idea about what dialects are and how they differ from accents, but what was still needed was a way to demonstrate to them that nonstandard dialects actually have grammar. As linguists know, this is one of the areas that is most often fraught with controversy in the public sphere, as most people are not aware of the linguistic equivalency of all dialects. To address this, we turned to Harper Lee’s novel, *To kill a mockingbird*.

Students had already discussed with their teacher that there were different types of English used in the novel. In a debriefing conversation, the teacher shared that in previous years when students read Lee’s book, she simply let them know that she would read the book as written while reading sections of it aloud. It was only because of the current conversations and using linguistics that she directed students’ attention to the different dialects used in the book this time around. The students identified: Standard English as used by Atticus Finch and Scout as narrator, Black English as used by Calpurnia at times, Southern English used by Scout and Jem, and uneducated Southern English used by Bob Ewell (these were the terms the students used). We provided students with the excerpts from the book in 1 and 2 and asked them to compare their structure to that of the standard dialect, note any differences, and identify any patterns. This exercise, while relying on relatively short excerpts, provided students the opportunity to conduct linguistic analysis and recognize systematic differences between dialects, relying on some of the concepts that had been discussed earlier in the year (e.g. parts of speech).12

(1) Excerpt 1 (*To kill a mockingbird*, Ch. 12)

‘What you want, Lula?’ she asked, in a tone I had never heard. [Calpurnia]

‘I wants to know why you bringin’ white chillun to a n**** church.’ [Lula]

‘They’s my comp’ny,’ said Calpurnia. [Calpurnia]

Again I thought her voice was strange: she was talking like the rest of them. [Scout]

‘Yeah, an’ I reckon you’s comp’ny at the Finch house durin’ the week.’ [Lula]

(2) Excerpt 2 (*To kill a mockingbird*, Ch. 17)

‘Well, I run around the house to get in, but he ran out the front door just ahead of me. I sawed who he was, all right. I was too distracted about Mayella to run after ’im. I run in the house and she was lyin’ on the floor squallin’—’ [Bob Ewell]

‘Then what did you do?’ [prosecutor, Gilmer]

‘Why I run for Tate quick as I could. I knowed who it was, all right, lived down yonder in that n****-nest, passed the house every day. Jedge, I’ve asked this county for fifteen years to clean out that nest down yonder, they’re dangerous to live around ’sides devaluin’ my property—’ [Bob Ewell]

First, the students recognized that there were different ways of using English in these excerpts, and that Bob Ewell’s speech was different from Calpurnia’s and Lula’s. The features that captured students’ attention for African American English were the missing *do*.

12 The full assignment and the solution are provided in the online supplementary materials. All supplementary materials can be accessed at http://muse.jhu.edu/resolve/70.
from questions (What you want, Lula?), the presence of <s> on verbs (I wants to know),
the use of <'s> [is] instead of are (They’s my comp’ny, I reckon you’s comp’ny), and
the pronunciation of words like chillun. We discussed how these were systematic differences
that were predictable within the dialect. We asked the students how Calpurnia or Lula
might say Bob Ewell’s words they’re dangerous, which they correctly predicted as they’s
dangerous. In Bob Ewell’s speech, the students identified the use of the regular past tense
for irregular verbs, such as sawed and knowed, but also noticed that there were inconsistencies
in their use: for example, he used both run and ran for the past tense; students dis-
cussed how this way of speaking was not like the Southern dialect that Scout or Jem were
using (which is why they dubbed it ‘unedicated Southern English’).

In addition to this discussion about grammatical differences between dialects, an in-
teresting conversation ensued as the focus fell on the overt reference to the different dia-
lects that Calpurnia mastered, as illustrated in Scout’s remark in 1 above, ‘Again I
thought her voice was strange: she was talking like the rest of them’, as well as in an-
other section in the book where Scout and Calpurnia had discussions about why Calpur-
nia did not ‘talk like the rest of `em’ and how she ‘led a modest double life’ and had
‘command of two languages’, one of which was ‘not right’, yet which was appropriate
to use within the group (Ch. 12).

(3) Excerpt 3 (To kill a mockingbird, Ch. 12)

That Calpurnia led a modest double life never dawned on me. The idea
that she had a separate existence outside our household was a novel one, to
say nothing of her having command of two languages.

‘Cal,’ I asked, ‘why do you talk n*** talk to the—to your folks when you
know it’s not right?’

‘Well, in the first place I’m black—’

‘That doesn’t mean you hafta talk that way when you know better,’ said
Jem.

Calpurnia tilted her hat and scratched her head, then pressed her hat down
carefully over her ears. ‘It’s right hard to say,’ she said. ‘Suppose you and
Scout talked colored-folks’ talk at home—it’d be out of place, wouldn’t it?
Now what if I talked white-folks’ talk at church, and with my neighbors?
They’d think I was puttin’ on airs to beat Moses.’

Students also wanted to discuss the use of the n-word, which was obvious in the
book, as in the excerpts above, and for which the book has often been the subject of
controversy and even censorship. They wanted to know if it was ever acceptable to use
it if one were not African American, especially since some people seemed to use it in a
positive way, as when referring to one’s friends. They also invoked its use in music and
by certain comedians. While some students immediately said that it was never accept-
able to use the word and did not need further discussion, others had a genuine interest in
understanding why that was the case, so we discussed the word’s racist connotations
and how group membership can govern the use of particular words. Because of their ex-
perience with PBL and tackling difficult topics, the students were very much at ease
with the discussion, which was fruitful and left the students generally satisfied with un-
derstanding why the word’s use is restricted.

Student understanding of the linguistic concepts in this unit was assessed by asking
them to answer (in writing) a number of questions about the difference between accents
and dialects and whether dialects were bad grammar. The full assignment sheet is pro-
vided in the online supplementary materials. As evidenced by the representative re-
sponses in 4 and 5, students understood that dialects are different varieties of a language,
and that the desirability of one dialect over another is connected to the desirability of one group of speakers over another.

(4) QUESTION 1: Why are dialects not just a ‘bad’ version of standard English?
- No one really talks standard English, everyone kind of has a dialect, so then if it was referred to [as] ‘bad’ then everyone would talk ‘bad’ly.
- Because it is socially accepted, or that people have their own version of standard.
- Dialects are not a bad version because everybody has a different way of speaking (even yourself), and you have to consider that you sound odd to other people.
- Because they follow a grammatical structure and are English, but just a way of using different words of the English dictionary.
- Because there is no such thing as ‘correct’ English.
- It’s different to what we know as normal, so we call it weird or bad.
- Dialect is still English, just said very differently. Dialect is different grammar, but it’s not wrong or bad, it’s still English.
- Because they all have rules and are learned from those around them.

(5) QUESTION 2: Why do you think that some accents/dialects are viewed as bad or incorrect and others seem more desirable?
- Because people in America are used to certain dialects and accents. So some of the less common ones are viewed as weird, incorrect, or bad.
- Because people that speak such accents/dialects are viewed as bad.
- Because people from their own dialect think the other people talk weird with them not knowing they talk weird too.
- Because people aren’t used to hearing different things when they grew up learning it in a different way.
- ♪ Uuuuu - pin - ions!!! ♪ [Invoking opinions featured prominently as an answer to this question.]
- It’s dialects that belong to a group of people that are discriminated against are viewed as bad by people that are in positions of power a lot of the time.
- It is because of the way society views the group of people that speak the different version of English.
- I think some are viewed badly because of who says it and where they’re from.

Still, a very small number of students (six of the forty-six who completed the assignment) appeared to remain unconvinced of the linguistic validity of all dialects, as shown in the responses in 6. This often happens in college classrooms as well. One student wrote in response to the first question about why dialects are not just a bad version of English: ‘I understand it’s her dialect (Calpurnia’s) but in my opinion it’s a bad way of speaking’. Some students answered question 2 about BAD VS. DESIRABLE dialects as follows.

(6) Selected answers to question 2
- Some are viewed that way maybe because they aren’t understood or they don’t have proper grammar.
- Maybe because there [their] grammer [sic] is not correct.
- Because one is more proper than the other. Also people think that there’s [theirs] is right but someone else is wrong.
- The more desirable ones are the more common ones, and the ones that are closer to the way they were originally intended.
To sum up, while linguistics did not feature prominently in the students’ ‘The ripple effect’ project, their learning was enhanced through linguistics by focusing on how human linguistic behavior has an effect both on speakers and on those with whom they interact—in essence, human linguistic behavior also has a ripple effect. *To kill a mockingbird* offered a perfect opportunity to discuss dialects, to conduct linguistic analysis, and to have multiple conversations about the power of words and appropriate uses of language in different situations and with different people. In this same context students were also engaged in conversations about accents, regional dialects, and linguistic stereotypes, and they made connections to how our views of language influence how we treat others and how others treat us. This was a specific attempt to link linguistics to the students’ project in order to make it more meaningful rather than simply talking about dialects, but this topic is also very likely to have been well received even in the absence of a larger project, since sociolinguistic topics are pretty accessible to students and nonlinguists in general (as the various works by Reaser, Wolfram, and colleagues mentioned above also indicate). However, the fact that the activities were coupled with the book they were reading made the connections more authentic and memorable for the students and the teachers alike.

### 3.3. Linguistics in PBL: Language, Culture, Identity, and Language Loss and Maintenance.

The project described in this section integrated linguistics fully, representing the other end of the spectrum for this model. Through ‘The stars and stories project’ students explored astronomy and learned about the role of stars and constellations in human history, but more importantly, they learned about the history of Native Americans in the United States and the relationship between culture and language. Given the school’s location in San Diego County, as well as the involvement of a Luiseño co-teacher working with the team during this year, these topics were approached through the lens of the Kumeyaay people in the Kumeyaay Nation, which consists of the greater San Diego region as well as parts of Northern Mexico (note: in order to honor the people in the region, the Luiseño instructor suggested that the project focus on the Kumeyaay rather than the Luiseño, who are also present in this region, but north of San Diego County and south of Los Angeles). The middle-school teaching team (the science-math teacher, the humanities teacher, two co-teachers, and the digital arts instructor) originated the project idea and the overall design, and through many conversations among the collaborating partners language became a component critical to the success of the project.

The essential questions were: How have patterns in the night sky guided ancient and modern humans? What responsibility do we have to honor and respect other cultures? Students worked in teams, and each team member selected one of four roles, including that of *anthrolinguist*, who was ‘responsible for being an expert on Kumeyaay culture and language’. In addition, one of the products that students were responsible for creating through this project was an essay in which ‘students share[d] what they have learned about Kumeyaay culture in San Diego and what the importance of culture, language, and tradition are within the Native American community’. As is clear from these two important project components, the study of language and its role was critical to a successful outcome of the project.

The main objective related to language was to help students see the connection between language and culture and language and identity, so that they realize the significance of language loss that Native Americans have experienced and the importance of language maintenance. To understand these topics students needed to understand what
language is and what it does, which is where linguistics came in. Specific activities were designed, as outlined in Table 3, though they were not all designed simultaneously, but rather emerged in response to student engagement and knowledge. Each of these activities is described in detail below.

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>OBJECTIVE</th>
</tr>
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<tbody>
<tr>
<td>Socratic seminar: Why is language important?</td>
<td>Students understand that language is more than just communication; students discuss what is lost when a language is lost.</td>
</tr>
<tr>
<td>Google Translate activity</td>
<td>Students understand that things are ‘lost in translation’ and something is lost when a language is lost.</td>
</tr>
<tr>
<td>Standard English challenge</td>
<td>Students understand the difficulty of giving up the way they speak; students connect language to culture and better understand language loss.</td>
</tr>
<tr>
<td>Data analysis:</td>
<td>Students understand differences between standard and nonstandard language; students find patterns in Kumeyaay dialect and get a small glimpse into linguistic diversity.</td>
</tr>
<tr>
<td>• Uses of <em>like</em></td>
<td></td>
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<tr>
<td>• ‘Iipay Aa data and simple sentence formation</td>
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Table 3. ‘Stars and stories project’ and linguistics.

**Socratic Seminar: Why is language important?** Most people who have not studied linguistics understand that language is used for communication, but not what it means to know a language—in other words, they do not understand language as a linguist does. Because we wanted students to realize the connection between language and culture, we first wanted them to explore their own understanding of what language is and why it is important. Thus, the Socratic seminar was designed as a forum for students to discuss why language is important and what they would lose if they lost their language. As an introduction to this seminar students were presented with a short lecture about the number of languages in the world and the endangered status of many (Romaine 2007), and then focused on language loss in California, where fewer than half of the numerous (about 100) indigenous languages still have speakers, many with fewer than ten elderly speakers. Students were then presented with the questions in 7 and were asked to respond to them in their journals.

(7) Socratic seminar discussion questions
a. Why is language important?
b. If language is a tool for communication, should it matter what language you use as long as you can communicate? Does it matter if some languages are lost?
c. What would you lose/miss if you lost your language?

Subsequently, ten students from each group were randomly selected to participate in the Socratic seminar where they discussed the same questions (thus, there were two such seminars, with ten students each). During the seminar, students recognized that language was important for communication, but many did not really see how it connected to culture. One student pointed out that during a field trip related to this project they had met some Kumeyaay people who ‘were still practicing their culture’ without speaking the language, which the student interpreted to mean that ‘you can keep your culture without the language’ (quotes from student). Another student stated that since there are so many languages in the world, it would actually help if their number were reduced, thereby leaving fewer languages that people would be able to learn so that they could communicate with each other better. Other students seemed to agree, especially
monolingual students whose answer to question 7c was mostly that they ‘would not be able to communicate and would have wasted all that time learning one language’ (English) if they had to learn another language instead. Some students stated that they would move to another country where they could still speak English. When reminded that they could use another language and they would know it, but that it just would not be English, they had a difficult time conceptualizing what that would be like. A few students, especially bilinguals but not exclusively, expressed that they would ‘lose a part of themselves’, that language is ‘our poems and books’, and one student said, ‘If I had to learn another language to use, I would have to become a whole new person’. A particular student stood out in this conversation. A monolingual English speaker, he seemed fascinated with the project and the Kumeyaay from the outset, which fueled his interest in the seminar as well. He expressed a desire to learn Kumeyaay and inquired about language documentation. While not part of the ten participants in the seminar, he asked to contribute and rounded out the discussion by saying: ‘If I lost my language I would lose my name, and any document or contract I ever signed’, to which another student added, ‘Would we be homeless?’ (presumably because of losing any contract ‘we’ might have signed). These were very insightful observations from a few students who seemed to have an understanding of the connection between language and culture and why language loss is significant. However, both the teacher and the linguist independently arrived at the conclusion that the students still had not made the connections fully, and decided that they needed an experience that would resemble language loss, however crudely. Students did not fully understand what culture was either, let alone its connection to language. After multiple conversations and imagined activities, we decided to engage students at the level of their teen culture: music and slang, as described below.

**Google translate and standard English challenge.** At the beginning of the second linguistics session of this project, students were asked to spend five minutes writing in their journals a response to the question ‘What is culture?’. The following list emerged from their answers and subsequent discussion: religion, how you live your life, customs, traditions, clothing, food, history of people, celebrations, myths, beliefs, it identifies you, food, language, stories, art, sports. When prompted further and asked whether music was culture, they enthusiastically agreed and also added memes, social media, local customs, and local hobbies (such as beach/surf culture in San Diego). As a follow-up, students were asked to select their favorite song lyrics of at least ten to fifteen words and use Google Translate to translate those lyrics from English to another language, from that language to yet another language, and then back to English (English → L1 → L2 → English). They were to compare the original to the translated version and discuss how that related to their project. Some students selected movie quotes or a quote from a favorite celebrity for this activity. Students pretty quickly realized that part of the message was ‘lost in translation’. One student recognized that ‘some songs have words that are more literal and those were easier to translate, but some songs have words that are more symbolic and those are harder to translate’. A brief discussion followed about how that symbolism is lost when you translate from one language to the next, and how that is related to language loss. Students enjoyed the activity and became somewhat more convinced of the importance of language maintenance; however, this was not sufficient to create the desired impact.

In order to build on the earlier discussion of culture and memes and music, students were asked if they used language differently with different people or in different situations (knowledge of register). As expected, they responded affirmatively. When asked
what words or expressions they would not say to their teachers or parents or on a job interview, they offered the following list: slang terms, gateway words (such as *freakin’*), *what’s good in the hood*, overuse of *like*, *bruh*, *salty*, *what up*, *LOL*, *OMG*, *’sup*, *yeet*, *fam*, *y’all*, *my dude*. All of their suggestions were recorded on the board, and then the students were immediately challenged to avoid all of those words and expressions. They were to use only standard English (formal English, really, for the purposes of this exercise), which was explained as the version of English that is recognized as the language of education. Students were given a printed list of rules they could not break, including avoiding the use of slang, *to be like* instead of *said*, dialect features (*y’all*, *ain’t*), and nonstandard forms such as *her* and *I* or *Can I*? instead of *May I*?; furthermore, they were to avoid text language, references to memes, and cussing. They were to hold themselves and each other accountable, and to follow these rules regardless of whom they interacted with at school for the remainder of the day. The reasoning behind this challenge was to take away their most comfortable way of speaking and have them experience language loss in a tangible way. We had considered asking a teacher to conduct part of a class in Spanish or American Sign Language, but decided against it since that would only have given students a taste of what it might be like to not understand the language around you, rather than losing their own language. They might have said that if they had understood the language they would have been fine, and nothing would have been lost. Asking them to give up slang and memes—which feature prominently in middle school—promised to be a more successful approach in creating an experience analogous to language loss. Before they were even dismissed from class, students began protesting the challenge, as illustrated in the conversations below.

(8) **Student 1:** I take offense to the no dialect thing, because what if that’s how I was raised?

   **Teacher:** But if you were on a job interview, would you say ‘Hey y’all?’

   **Student 2 (replying):** True.

(9) **Student 3:** It’s not fair to take away slang, that’s part of our teenage culture, you can’t take that away.

   **Teacher:** But you have to learn to speak standard English, so when you get a job you can speak that way.

   **Student 4 (overhearing):** I just won’t get a job.

Two other students also expressed that the challenge was going to be easy for them, because they ‘just won’t talk’. The impact thus immediately appeared to be promising; however, for the purposes of assessment students completed a short reflection assignment that was due at the end of the day and submitted online. Some representative samples from student reflections are given in 10 and 11.

(10) Question 1: Describe your experience today when you were asked to only use formal English. Was it difficult? Why or why not? What was your initial reaction? How successful were you? How successful were your classmates?

   • For the first one and a half hours I was a perfect law abiding student. I even wrote down over 25 infractions other people made. I was absolutely miserable. Never in my life have I wished more to have the ability to talk backwards just so that I could spice up what I was saying. There were no jokes, no fun, no nothing. It was horrendous. I gave up at break. I currently have the record of most improper english infractions. 117.

   • I was fine with it until the sheet said no using memes and in that instant I said nope nope nope I am not doing this. I went through break without
breaking but then lunch came and I broke and started talking like normal again.

• Overall, speaking in only formal English wasn’t very difficult for me, as I usually only speak informal English as a joke, if I’m in a rush, or I am very tired. I did find myself stutter more and slow down a lot, because I was thinking a significant amount more than usual to make sure I didn’t mess up. I believe I was successful, or at least more than my peers. I’ve messed up about 7–8 times, while some people are around 30–40 times or more.

• My experience I didn’t expect was actually very challenging. I realized that that’s how I speak everyday. It was difficult for me because I started to observe that not just me, but everyone around me uses slang language. If I couldn’t talk like everyone else it was very hard for them to understand me. Everyone that I saw, that was on this team, was having a really hard time. I say that because I noticed that nobody was really talking because it was that hard. That was the same for me too. [emphasis added]

When I heard we were asked to use only formal english, I was excited because I knew it would be a challenge to not use the words and phrases we use every day. It was difficult to not say things including hashtags, memes, like, and things with that while we had to speak differently from how we usually speak. I wasn’t expecting it to be that hard until we did it. Speaking formally hurt my brain cause I constantly had to think about what I’m saying. I feel like I was successful in that exercise along with the majority of my classmates. [emphasis added]

(11) QUESTION 2: What do you think the point of this exercise was? How does it relate to our project?

• When stripped of our ability to communicate with each other without restrictions, I felt like a depressed walrus. I had lost a piece of my culture and in turn, lost a piece of who I am. I don’t believe I truly got the importance that language plays on our culture until today. Thank god for my lack of commitment.

• We basically lost are [our] language that we speak in to are [our] friends and it was really hard. I think this relates to our project because if you lose your language then [then] you lose part of your culture and your personality.

• I think the point of this exercise was to teach us how much slang, text talking, memes, and other things actually affect us. Some people didn’t have as much trouble as others, all based on how we were raised and influenced by others. It relates to our project because it gave us a taste of how hard it is to lose our culture, or to be forced to talk and behave in certain ways.

• I think the point of that was to realize the language we use today. It can relate to our project because it shows that it is hard to just instantly start a new language.

• I think the point of that exercise was to get our mindset into thinking how people from different cultures and languages feel when we take away one of their languages and when they have to learn a whole new one apart from the words they used to use everyday. When we did that exercise, we had to imagine how the other cultures feel when we had to change our everyday words. In our project, we are trying to learn about the different
cultures and languages there are around us and try to walk in there [their] shoes (perspective taking)

- To show how the people who had there [their] language stripped away from them felt, because so much that there [they’re] used to can’t be done in other languages which kinda takes away a part of their identity and how they interact with the world and people around them.
- I am not exactly sure why we did this but we have been talking about language and culture in class a lot so I just thought it was maybe to show what it would be like if we suddenly couldn’t use certain words and lost most of our language and who we are.
- To me, This exercise was a way of showing students, including my peers and I if all of a sudden middle school language (Slang, etc / unproper grammar) just disappeared. Why are they showing us that? Because indians / native americans tribes languages are dying down and disappearing and when you lose something small like your language, it changes and effects [affects] your whole entire life, just how my peers were like i’m just not going to speak at all. … Imagine getting beaten every time you accidentally said one of those slang words when you weren’t supposed to. It’s pretty horrible that they did that to many native americans/indians.
- I think the point of this exercise was to show us how hard it would be to suddenly have part of our sort of culture taken away. Like how some kids were saying to make one ultimate language everyone knew but that would be extremely difficult. This relates to our project because This is a little sliver of what the spanish and english did to the native americans, they took away their culture.
- Last week we talked about what it might be like if your language was taken away, and this was just a sneak peek of what that would be like.

As evident in the students’ reflections, the Standard English challenge was a highly successful exercise that gave students a glimpse into what it would be like to lose one’s language and also illustrated the strong connection between language and culture. Of course, this experience cannot compare with that of being separated from one’s family, being forbidden to use one’s language, and being beaten for doing so. Since students had read and talked about Indian boarding schools prior to this exercise, we were hopeful that they would be able to recognize the parallels while appreciating the significant differences. As reflected in the quotes above, students indeed were able to do just this. They also began to understand that they use language in different ways and that it is difficult to change the way we talk when we have to follow rules that do not match the situation. Through the first three linguistically informed activities, students had realized the significance of language not only for their project, but also for the communities that have been affected by language loss throughout history. Two data-analysis sessions followed in order to solidify student understanding of language variation and standard English. The first involved English data on the uses of like (Brown 2009), and the second data from 'lipay Aa, a dialect of the Mesa Grande Diegueño (Kumeyaay) language (a morphosyntax problem set based on data from Couro & Langdon 1975).

Data analysis. The Standard English challenge had helped students realize that they do not always speak in the same way, and even those who thought they spoke academic English had recognized that they did not. From a linguistics perspective, it was also important for the students to understand the significance of language variation and ensure
that they were not confusing the challenge activity with a demonstration that they did not control some idealized version of English. As a follow-up to the challenge students were introduced to language variation in terms of registers and dialects, particularly the idea that dialects are rule-governed and that there are systematic differences between standard English and other language varieties. This topic was introduced using an exercise from Brown (2009:5–8), in which students analyzed the uses of *like* in various quotes from popular films. Teens are accustomed to being ostracized for overusing *like*, and people generally seem to think that all nonstandard uses of *like* are the same. In this exercise students had to group examples that used *like* in a similar way, provide an explanation for these categorizations, state whether the uses were standard or nonstandard, and provide meanings for each category. They worked individually and then in groups and identified the uses as a preposition and as a verb as standard, and the uses as a quotative (**to be like**), a filler, and a means of adding emphasis to what follows as nonstandard. These patterns were revealing to the students, who recognized for the first time that each *like* had a different meaning and that replacing *like* with something else in the nonstandard quotes would lead to a loss in meaning. For example, replacing **to be like** with *said* in the following quote from *Finding Nemo* would change the line significantly.

(12) a. Nonstandard: First you were like, ‘Whoa!’ And then we were all like, ‘Whoa!’ And then you were like ‘Whoa.’

b. Standard: First you said, ‘Whoa!’ And then we all said, ‘Whoa!’ And then you said ‘Whoa.’

This exercise not only helped students discover a pattern in language, but also validated their own language varieties and gave them a greater appreciation of linguistic diversity within English.

In order to introduce students to linguistic diversity outside of English and relate it to the student project, we presented them with a data set from 'Iipay Aa (a dialect of Kumeyaay), created specifically for this project and based on Couro and Langdon’s descriptive grammar (1975). This was an opportunity for students to do morphosyntactic analysis in the language of the people whose culture and language they were learning about; a random data set in a non-English language would not have been as relevant. A sample is presented in 13. The full assignment and the solution are provided in the online supplementary materials.

(13) Sample data from the 'Iipay Aa (Kumeyaay) problem set

'iikwich' 'man'
siny 'woman, girl'
'elymaam' 'child, little one'
'elymaam 'iikwich' 'boy'
'elymaam siny 'girl (usually under thirteen years old)'
hattepa 'coyote'
kuseyaay 'doctor'
Sinyches. 'It’s a woman.'
'Elymaam sinyches. 'It’s a girl.'
Hattepaaches. 'It’s a coyote.'
Siny kuseyaayches. 'The woman is a doctor.'
'iikwich kuseyaayches. 'The man is a doctor.'
'iikwichches. 'It’s a man.'

Students were to first determine the morphological structure of words and that of simple sentences, and subsequently work with more complex data that allowed them to form
their own sentences. The exercise was challenging for many students, as this was the first time for this group to grapple with a language unfamiliar to everyone (they had previously compared Spanish to English, with regard to noun-adjective order). By the end of the first session, about ten percent of the students had completed the analysis correctly, while many had been able to figure out the morphology and semantics but not the syntax, keeping the English word order. In 'Iipay Aa adjectives follow nouns, and referring to a male or female animal requires stating the name of the animal, followed by siny ‘woman’ or ‘ikwich ‘man’, and then an adjective to which the suffix -ches can be added to make a simple sentence (glossed as the copula in English). Thus Hattepa siny hechanches is ‘The female coyote is happy’. It was easier for some students to put the adjective last, but keep the word for ‘male’ or ‘female’ before the noun, as in English. In the following class session the students who had completed the analysis correctly became the experts who helped their classmates revise their analyses—a hallmark of PBL. Through this inquiry activity students understood not only more about how other languages can work, but also more about how English works (e.g. that it has a dummy subject it, and that English word order is not the only one that ‘makes sense’).

Finally, the students’ learning through this project and the integration of linguistics was enhanced by two guest speakers. First, Dr. Jocelyn Ahlers, a linguist who has been working with Native tribes for over two decades, spoke to the students about her experience with language documentation and revitalization efforts, and engaged them in an activity that provided a sense of how different languages and cultures can be. In Hupa, and in other languages in the world, when someone dies people can no longer reference their name without offense (Goddard 1903). Students were given a list of English names that can also have everyday referents, such as Sky, Cash, Chase, Hunter, Willow, and Brooke, and they had to think of ways that they would have to adjust their language in order to refer to those things without actually naming them. A favorite expression offered by a group of students was Talking Stream for ‘Brooke’.

The other guest speaker was Stan Rodriguez, a native speaker of Kumeyaay who is well known for his activism in sharing his love of Kumeyaay culture and language with both tribal and nontribal communities. He spoke to the whole group about the Kumeyaay creation story, as it related to the student’s project, and also met with small groups who interviewed him about Kumeyaay place names in San Diego and the significance of each name and its relation to place. The students’ project culminated in a public exhibition where they presented their learning to Rodriguez’s college students in a course on American Indian Communities, as well as to parents and members of the university community. The role of linguistics and the study of language in relation to culture was evident in the student’s presentations as they reflected on their understanding of the importance of linguistic diversity and language maintenance.

3.4. Impact of doing linguistics in the classroom. Both of the projects described above involved the study of language and linguistics, and in both students conducted linguistic analysis (e.g. systematicity in dialect differences, morphosyntax) and engaged in critical discussions about what language is and why it is important beyond its communicative purpose. The students’ learning was enhanced by linguistics in both cases, as reflected in their responses on assessment tools (reflections, assignments) and during class discussions. Furthermore, the collaborating teachers recognized the impact that the linguistics work has had on themselves and their students, as seen in a quote from the teacher collaborating with the linguist for the duration of the partnership:

The work that we have been doing in the classroom has had a profound impact on both me and my students. First of all, from a purely educational standpoint, it has helped to give context to some of the nec-
essay skills that students need but often don’t learn in isolation in the classroom. Teaching the rules of English grammar doesn’t often stick with some students because it seems to be a list of rules they simply have to memorize, but also know that many get broken regularly. Instead, by having a more ‘linguistics lab’ approach, students can explore English usage and develop patterns and theories about usage through critical thinking. In my classroom, I have seen a difference in students’ understanding of structure and their ability to reason through sentences.

More importantly, I think the work the students did exploring dialects, accents, and languages furthered their understanding of the world around them. Our school values students from diverse backgrounds working together, and language is often seen as something that can divide people. Our students explored the concepts of no language or dialect being wrong or just a form of bad grammar, but something that is ingrained with a person’s culture. When our students were doing a project on the Kumeyaay Nation, it would have been impossible to study their astronomy, land, and culture without some knowledge of their language.

I have also learned an immense amount through the work that … has [been] done with our classroom. It was fascinating as a teacher to see students explore the concepts of English usage and sentence structure and struggle through finding the ‘rules.’ I appreciate the critical thinking that is involved in having students explore language and not just be given a set of rules to follow. Even as an English teacher, I was challenged to think about language in new ways and check myself for biases that I might have had toward different variations of language.

Furthermore, in debriefing surveys and conversations with other collaborating teachers during the projects, the math-science teacher recognized that students ‘started to pick up stems and try to piece them together’ in science, while another humanities teacher shared that while she was familiar with writing conventions and grammatical rules, ‘realizing that we can recognize patterns within language has changed [her] personal understanding of language’. She added:

This collaborative effort has really brightened my ELA [English Language Arts] instruction by making language something that students can grapple with. Since linguistics is the scientific study of language, students are able to be more ‘hands-on’ with these linguistics-based activities which gives them more confidence in their reading and especially their writing.

It is evident from the above that linguistics in the classroom, particularly when integrated into student projects, can be a powerful teaching and learning tool for students and teachers alike. In a parallel way, this model of incorporating linguistics into PBL and the collaboration with teachers has greatly impacted my understanding as a linguist of the role of linguistics in K–8 education, as anticipated by the collaborative partnership and reaching back to the impetus for this work. The work with students and teachers ‘in the trenches’ and the engagement in a different way of teaching (PBL) has positively affected the teaching of linguistics for prospective teachers at the partnering university. Content for courses for prospective teachers has been modified as a direct result of this collaboration, and the K–8 classroom experience adds credibility and encourages prospective teachers to be more invested in their learning of linguistics and exploring its use in their future careers. My students and the students of colleagues who have made similar changes to their courses as a result of this partnership have had to grapple with the practical applications of linguistics in a potential classroom, exploring content standards and how specific linguistics activities can meet them, and problem-solving solutions to common student struggles (e.g. use of fragments in creative writing vs. in argumentative writing).

4. CONCLUSIONS. This article represents a first iteration of a model for incorporating linguistics into project-based learning via a partnership between a linguist and a middle-school humanities teacher. Building on the previous work of linguists who have worked with teachers in K–12 schools, this work shows how linguistics can be incorporated into the curriculum in schools that embrace PBL. This requires a partnership be-
between willing teachers and linguists, time, creative thought, and ample flexibility, as projects are authentic and can change in response to student learning. PBL’s promise of leading to more lasting outcomes and deeper learning should make this approach appealing to other linguists who are interested in working with educators, particularly in schools that are adopting PBL methodology, as educators would see how linguistics can enhance student learning and understanding without taking time away from the class (as their concern might be if linguistics is approached as a separate subject). Furthermore, the principles of this model can be adapted to other pedagogical approaches employed at any particular partner school, since the crucial aspect of the model is finding meaningful connections between existing curricula and linguistics, and engaging students in linguistics activities that make these connections clear. As is evident in student reflections and assessments, studying linguistics in the context of PBL does have a positive impact on learning. Similarly, teachers and linguists alike also reported a positive impact of linguistics in PBL. This work should motivate other linguists, and teachers, to become involved in this type of collaborative partnership, as it is an area of linguistics that can have significant impact on the future of linguistics, of education, and on the linguistic education of citizens in our communities.

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