



Playful Semiotic Assemblages: Agency in Task-Based Interviews With Multilingual College Students in STEM

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Abstract: Supporting multilingual learners in leveraging diverse semiotic resources is essential to inclusive and effective science education. Hence, we examined how activity is shaped in a novel, STEM task-based interview with multilingual college students, focusing on how agency is enacted and distributed within the space through the lens of semiotic assemblage (Pennycook, 2017, 2024). We detail the shaping of activity by two pairs—Spanish speakers, Dani and Eva, and Cantonese-Mandarin speakers, Emma and Sophia. We discuss the production of agency through their affective responses and performative interaction with the research tools, like the camera and microphone. Additionally, we elaborate on how they expressed their sense of humor, integrated their interests, and established their own standards within the interview setting. These findings hold implications for conducting video-recorded research and designing learning environments that engage multilingual learners in using diverse repertoires in science.

Introduction

Recognizing and supporting multilingual learners' (MLs) diverse ways of communicating and doing science are commonplace among recent calls to foster educational equity (Grapin et al., 2023). Amidst such recommendations is the continued call to affirm students' agency and the legitimacy of their sensemaking practices. This is because judgements about whose perspectives and discourses matter happen at innumerable scales within education systems, ultimately influencing decisions about who has access to learning what (Calabrese Barton & Tan, 2022).

Fundamental to achieving the above recommendations is the continued development and application of theories that frame MLs as agentive communicators whose interactions, ideas, and language use matter within learning environments. Here, we build on Ahearn's (2001) definition of agency: having agency is being positioned with the capacity to shape ongoing activity, and being agentive is acting on the capacity to shape ongoing activity. We note that agency is distributed throughout a learning environment and arises from the material and symbolic interactions among persons, objects, and ideas. To illuminate the relationship between agency and activity, we employ *semiotic assemblage* as a lens to examine coordinated activity (e.g., learning) as emerging from the agency distributed across interactions. More precisely, semiotic assemblage is the very ways in which linguistic resources, social space, and activity become interrelated in any communicative activity (Pennycook, 2017, 2024). This framing eschews viewing language and linguistic repertoires as bounded things that belong to a person and reside in their mind. Rather, language is one form through which meaning can emerge in relation to the other resources being used in a communicative activity (Canagarajah, 2020; Pennycook, 2017, 2024).

To identify how to better affirm MLs' agency in science, our research seeks to understand how MLs perceive, attribute, and enact agency. To that end, we invited pairs of multilingual college students in the U.S. to a task-based interview where they were encouraged to use any language they wanted to. Thus, we examined the distribution of agency by asking an exploratory research question, *How is the semiotic assemblage of activity in a task-based interview shaped by college-going multilingual students?*

Methods

Research context and researcher positionality

The present work is part of a larger research agenda on college MLs, with the ultimate goal of theorizing about communicative repertoires in ways that can inform professional development and curricular approaches in higher education STEM. All members of this research team are multilingual. We draw on our varied linguistic histories to bring alternative insight to each other's interpretations. In addition, we make our joy for language and interest in equity for MLs known to our research participants, which manifests in our relational and ethical approach to establishing rapport with them. Such decisions are made in a deliberate attempt to engage with our theoretical orientation that the mundane aspects of our daily presentation affect communication.

Participants, data, and protocols

We conducted task-based interviews with pairs of colingual, multilingual undergraduate students. In recruitment, “multilingual” was defined as speaking two or more named languages at least somewhat frequently. Pairs had to sign up together, so all participants had some existing relationship prior to the interview. The linguistic pairs included Arabic, Burmese, Cantonese and Mandarin, French, Spanish, Telugu, Ukrainian, and Yoruba. The interviews were conducted in a conference room, in which the participants sat at a table across from a video camera on a tripod. The participants wore wireless lapel microphones. The audio-video recording was transcribed verbatim and translated by multilingual members of the research team and professional multilingual affiliates.

The task-based interview involved questions about the participants’ linguistic histories and relationship, six problem-solving tasks, a reading and writing task, and two mini-labs. All task content and instructions were designed to be familiar to an average first-year college student in STEM. The mini-lab featured in this paper’s results explored principles of acids and bases using a turmeric solution. We provided instructions for creating the solutions plus instructions that read, “Use the damp Q-tip to draw a letter, symbol, or write a secret message on the paper.” Then, they were instructed to “apply Solution B (turmeric solution) on the paper using a paint brush,” which reveals the message. In addition, participants were asked to write or draw their observations and then respond to the prompt: “How would you explain the science behind your observations from this experiment?” Figure 1 shows the two exemplar pairs’ writing. No pairs reported prior familiarity with the turmeric mini-lab.

Analytic approach

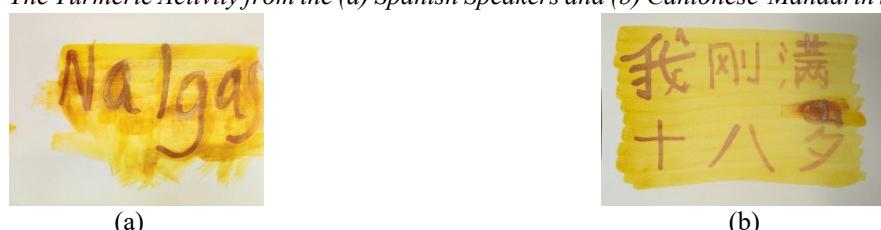
Given our exploratory research goals, we employed an inquiry-driven video analytic approach (Derry et al., 2010). Preliminary efforts to distill the entire data set involved provisional and gerund-based coding (Saldaña, 2021) of the video and transcript. These codes served to identify and characterize the participants explicitly reflecting on the interview setting (i.e., how to use their languages, discerning expectations, or referring to data collection). From this process, we noted several events in which writing coincided with distinct playfulness and negotiation of how to perform the activity. These moments differed from other, more mundane exchanges about writing or spelling wherein a quick internet search resolved the concern. Excerpts from the Spanish speakers and the Cantonese-Mandarin speakers were frequently coded with laughter, allusions to external media, and moments of acting. Thus, their interviews were selected for deeper multi-modal analysis. We conjectured that these high-affect engagements with language were not an absence of proficiency but rather evidence of intentional problem-solving within a stream of activity. To investigate this conjecture, we drew analytic inspiration from past works on assemblage (Canagarajah, 2020; Pennycook, 2017). We memoed, discussed, and made visualizations about the video data to discern how persons, objects, language, and ideas came into relationship to form trajectories of activity. Visualizations, like sketches overlaid on still frames and timelines, afforded comparing movement in the environment. Using memos, we verbalized connections among the participants’ discourse, intertextual references to media or other experiences, and the mini-lab activity. For the present short paper, we present episodes from the mini-lab activity that involved playing with self-expression and agency amidst the interview setting.

Results

The Spanish speakers and Cantonese-Mandarin speakers engaged in semiotic assemblages that transformed the possible activity in the mini-lab from the researchers’ original intention of doing science to producing an artifact worth presenting and using in humorous performances. In doing so, the research tools took on new purposes as the participants re-envisioned them as tools for their own content creation. The collective outcome of these episodes was the students positioning themselves as having ownership over what happens in a task-based research interview. In speech excerpts below, *italics* represents Spanish and underlined represents translation.

Figure 1

The Turmeric Activity from the (a) Spanish Speakers and (b) Cantonese-Mandarin Speakers



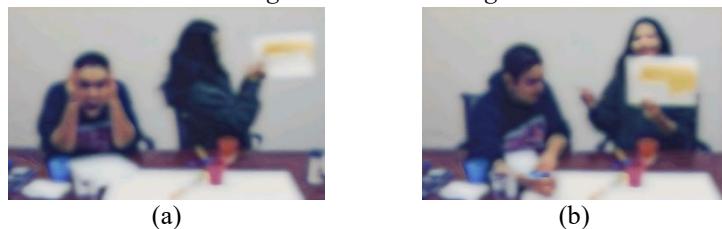
Spanish speakers: Dani and Eva

Dani (they/them) and Eva (she/her) were classmates who both grew up speaking Spanish at home. They first interacted with each other when the researchers recruited from their classroom. This pair playfully negotiated how to execute the mini-lab, redefining the scope of possibilities for the research tools provided in this space. By changing how they related to the microphones and camera, they re-envisioned the interview as a performative space akin to content creation, involving a dramatized presentation of their secret message, “*Nalgas*,” meaning buttocks, or in the words of the students, “booties” (Figure 1a).

Eva delegated the decision about what to write to Dani by encouraging them to write whatever they wanted to. Dani’s affective demeanor, including smiles and laughter, hinted at an air of subversion in choosing to write “*nalgas*,” a word that may be considered less appropriate in some strict academic settings. A few letters into writing, Dani asked, “*¿Sí ves? (Do you see it?)*” Eva replied, “*No, no veo nada (No, I don’t see anything)*.” Eva leaned in to look more closely. When she recognized the word, she threw her head back, clapped her hands together, and exclaimed, “Oh! Oh my god!” She seemed equally shocked and amused. Dani finished writing and giggled, appearing satisfied with their word choice and Eva’s reaction. Dani asked if they spelled it right, so Eva sounded it out loud and nodded. Although these participants were not friends prior to the interview, they infused their sense of humor into the activity, in lieu of emotional disconnection.

The microphone and camera became increasingly consequential to the shifting trajectory; their role as data collection devices became passive while their potential to be tools for content creation was made manifest. While Dani was writing, Eva smiled and looked directly at the camera for a moment. She also pulled the lapel microphone closer to her face, lightly blew two puffs of air into it, and then grinned. Connecting with the devices in these ways seemed to be deliberate interruptions of—or perhaps outright disregard for—any figurative fourth wall between themselves and the researchers mediated by the tools. They started chatting about their plans for later, but Eva interrupted when she again brought the microphone close to her mouth and made popping noises with her lips. She whispered, “ASMR,” a reference to autonomous sensory meridian response—a tingling sensation and the genre of entertainment media designed to stimulate that response. Mimicking ASMR content creation activated social discourses from new media, reconfiguring the role of the participants, tools, and even the researchers in this assemblage: Whereas the researchers depended on the microphone to know what happened in the interview, the students now used the microphone to accentuate and amplify their self-expression, positioning the researchers as the audience to their performance.

Figure 2
Dani and Eva Presenting their Secret Message to the Camera



(a)

(b)

The pair escalated the drama of their secret message by revealing it to the camera. As “*nalgas*” appeared with the application of the turmeric, Eva smiled and Dani giggled. Eva picked up the paper and held it to the side, showing it to the camera like a game show host, and continued painting (Figure 2a). Dani made an exaggerated face of shock by looking directly into the camera, putting both hands on their face, raising their eyebrows, and opening their mouth wide (Figure 2a). When the full word appeared, Eva faced the camera and smiled (Figure 2b). Their intense expressions and gestures were reminiscent of react content—a genre of short form video wherein a user films themselves reacting to something shocking or interesting. Together, the pair’s behaviors foregrounded the distributed agency in navigating the tensions of being a research participant on camera: The researchers wanted them to execute certain tasks, but the agency for making that happen was vested largely in how the pair, their ideas, and the available materials became part of a flow of action. Whether this was showcasing the paper, mimicking ASMR, or simply playing with the microphones somewhat absent-mindedly, the pair used the data collection tools to define their participation.

Cantonese and Mandarin speakers: Emma and Sophia

Emma (she/her) and Sophia (she/her) were friends. Both grew up speaking Cantonese at home in the U.S. and studied Mandarin for four years in high school. Through the pair’s allusions to Chinese internet culture, the mini-lab activity was re-shaped to be a re-production of a 2023 meme from Douyin (the original app made by the

creators of TikTok for the Chinese market), complete with their own standards for appropriate production. Their activity became an experimental performance of (re-)producing Chinese characters, viral media, and chemistry.

While deciding what to write, the pair drew inspiration from Chinese internet culture, but they had to negotiate what message would be appropriate. Their affective reactions indicated whether an idea was too boring to be a secret message, too taboo for the activity, or just right. Emma proposed that they “write something in Chinese.” When Sophia agreed and pondered what they should write, Emma offered, in Cantonese, “你好? (Hello?) Nah, that’s too basic.” After a four second pause, Emma smiled and suggested, “DDLM?” DDLM was likely a mistakenly pronounced reference to DLLM, an initialism for a crude expression in Cantonese. Sophia slowly furrowed her brow and opened her mouth, expressing surprise at the crude suggestion. Seeing this face, Emma started laughing. Sophia seemed appalled that Emma suggested a profane message (that is unambiguously crude to those familiar and easily searchable to the unfamiliar), yet Sophia’s next idea was comparably crude, just more covertly so. In Mandarin, Sophia said, “我刚满十八岁 (I just turned 18 years old.)” Emma laughed and repeated it back. Although the sentence’s literal meaning was benign, the pair was referencing a meme with suggestive overtones: It was a direct quote from a 2023 viral video trend on Douyin in which a woman’s suggestive responses to a street interviewer were parodied by other content creators.

This message became the focus of production for the pair as they re-enacted the meme and worked to produce a written version that satisfied their standards. At first, they attended to accurately spelling it. Since they did not know how to spell all the characters, Sophia searched for it online. Emma said she knew 我, so she wrote it and passed the paper to Sophia to finish the rest (Figure 1b). While Sophia wrote, Emma re-enacted several lines from the viral video and remarked, “Your handwriting is so much better than mine.” Once Sophia was done, she realized, “Oh no, I actually wrote an extra stroke here. Whatever.” While Emma fanned the paper to dry the message, Sophia quietly asked, “Is it too late to correct it?” The extra stroke in question was an extra horizontal line under 十 in 满. Shortly after, as Emma began brushing on the turmeric, she said, “I want to take a photo of this later.” The secret message became something they felt ownership over, something worth preserving and potentially sharing with others, like the meme itself. Once the 满 character appeared, Sophia said, “That part, you gotta like edit it in your picture. You gotta erase the bottom, this part. It’s written wrong.” Once the whole message appeared, Sophia stifled a laugh and said, “Oh my gosh,” and Emma again quoted the secret message in a sing-songy voice and laughed. Across these interactions, the students established a standard of presentability by caring about the accuracy of their spelling and the aesthetic outcome, which might be especially important if this artifact itself were to become memetic. In summary, Sophia, Emma, and the viral video played a role in reinscribing the norms of the activity solicited by the researchers by layering in the reproduction of an internet meme and the production of a message that was presentable on their terms.

Discussion

Our analysis revealed that reconfigurations of research tools and the mini-lab exercise were consequential to activity transformation. To us as researchers, the microphones and camera were mundane tools for collecting data. For the participants, these things were essential to their construction of a hybridized activity that blended the mini-lab and ideas introduced from new media. Although they sometimes used the internet to search for spelling, the participants seemed invested in a form of presentability for their secret message other than mere correctness. The Spanish speakers emulated content creation to reveal a surprising message, combining allusions to ASMR and react content. By quoting a viral video and photographing their artifact, which could be shared with others familiar with the meme, the Cantonese-Mandarin speakers formed an assemblage that blended meme culture and the mini-lab. Although our findings upheld a somewhat participant-centric focus, the semiotic assemblage framework (Pennycook, 2017, 2024) helped characterize the relational, beyond-human agency in this transformation. Using this framework, we showed that the activity was not predestined by the research team’s wishes but was instead made in the unique interactions between the pair and the local space. The interview setting became a space for pairs to showcase interests, express humor, behave theatrically, and establish their own standards for completing the activity, which included deciding the purpose and qualifications of a good secret message.

Since this study is observational and set in only one time and place, the claims we derive are tentative. That is, we hypothesize that MLs will continue to subvert the expectations of designers of learning activity environments. Future work may examine how objects that are not typically considered canonical to a classroom (e.g., microphones in a chemistry lab) encourage students’ creative engagement in hybridizing discourses. To understand the intentions, potential, and utility of such subversions, educators and researchers should continue to see MLs and beyond-human elements as agents in semiotic assemblage. This orientation decenters deficit-oriented ideas, like viewing language proficiencies as something a person has or lacks, and instead illuminates the uncountable ways that MLs find joy and take ownership in STEM spaces.



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