



Entextualized Humor in the Formation of Scientist Identities among U.S. Undergraduates

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Studies of the socialization of novices into scientific cultures typically emphasize official knowledge-making activities. However, scientific socialization is also accomplished informally through humor. As entextualized humor, formulaic jokes enable U.S. undergraduate students in science to claim scientist identities both through a displayed orientation to scientific knowledge and through the cultural practice of circulating humorous scientific texts. In response, recipients may align or disalign with these identities and thus position themselves in relation to science cultures. [humor, higher education, identity, science, stance]

Like other approaches to science studies and science education, anthropological studies of both professional scientific practice and the socialization of scientific novices have focused extensively on official knowledge-making activities, or what has been called “the serious side of science” (Mulkey and Gilbert 1982:585).¹ Studies of professional science have shed light on how knowledge is built in a variety of scientific cultures (e.g., Knorr-Cetina 1999; Marks 2009; Nader 1996; Ochs & Jacoby 1997; Traweek 1988), while research in educational and apprenticeship contexts has investigated the process whereby novices enter into scientific ways of thinking and acting (e.g., Baquedano-López et al. 2005; Eisenhart 1996; Goodwin 1994; Grasseni 2007; Jacoby and Gonzales 1991). Such studies have demonstrated the importance of examining both the ethnographic and the interactional specificities of knowledge production and cultural reproduction in scientific domains.

Far less attention has been paid, however, to the informal everyday practices that contribute to the formation of scientific identities among experts and novices alike. One key unofficial but culturally significant practice is the circulation of textual forms of science-based humor. Scientific and technical fields have a long-standing and well-established tradition of humor of this type, much of it now Internet based, as exemplified by online compendia of formulaic or “canned” jokes like Mathematical Humor, DC Physics Humor, and Science Humor; Web comics such as Abstruse Goose and xkcd; and novelty T-shirts sold by websites like Think Geek. As a genre, formulaic jokes are relatively fixed in their textual form (e.g., riddles, narrative jokes), as opposed to spontaneous forms of humor (e.g., quips, teasing) that are generated in the moment. Such jokes are of particular interest in the study of scientific identity formation because, to a greater extent than T-shirts and comics, on the one hand, or spontaneously produced humor, on the other hand, they straddle the line between text and interaction. Formulaic jokes readily recirculate interactionally as texts and thus offer specific resources for identity work: as an act of identity, telling a science-based formulaic joke involves not only sufficient scientific knowledge to get the science right but also sufficient cultural knowledge to reproduce the text in the first place. Formulaic joke telling thus serves as an interactional resource for displaying both cultural and scientific expertise and hence for claiming membership in scientific communities. Through such humor, novices can position themselves as at least partial experts and cultural insiders even before they have mastered the subject matter of their field of study.

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Although some research has investigated the role of spontaneous interactional humor in forging identities within educational institutions (e.g., Baynham 1996; Norrick and Klein 2008) as well as professional settings (e.g., Fine and de Soucey 2005; Lynch 2010), formulaic humor has not received the same attention. Unlike humor produced in the interactional moment, which is not scripted and does not necessarily go on to enter new contexts, by their very nature formulaic jokes as well as cartoons and the like circulate and recirculate via *entextualization*, “the process of rendering discourse extractable, of making a stretch of linguistic production into a unit—a *text*—that can be lifted out of its interactional setting” (Bauman and Briggs 1990:73; original emphasis). As prepackaged, clearly bounded objects, entextualized chunks of discourse such as formulaic jokes are readily decontextualized from their original site of production and recontextualized within new discourse settings (Bauman and Briggs 1990; Silverstein and Urban 1996). Entextualization enables culture to be reproduced as well as reworked when cultural forms are embedded in new contexts in innovative ways; it is hence a common tool for socialization and especially for education.

In previous interactional studies of science education, entextualization and the related notion of inscription have been used to show how scientific authority is constituted through the circulation and interpretation of scientific texts and images among novices (Roth et al. 2005; Viechnicki and Kuipers 2008). In this article, we demonstrate that entextualization is also a resource for informal scientific socialization, as students negotiate scientist identities through the recontextualization of formulaic scientific humor within interaction. Because such humor involves specialized knowledge, these recontextualizations require novices in particular—whether joke tellers or joke recipients—to indexically position themselves in relation to the scientific domain of which the joke is a part; over time such interactional positions may solidify into more enduring identities. We further argue that given its basis in previously existing cultural knowledge as well as its indexical reworking of cultural texts in new discursive contexts, entextualization lies at the very heart of socialization into institutions that rely crucially on textuality, such as science.

Entextualized Humor in Scientific Interaction

Despite the centrality of entextualized humor in scientific cultures, its role in science-oriented interaction remains largely uninvestigated. In science education, jokes and cartoons have been investigated primarily as a pedagogical aid (e.g., Fisher 1997; Roesky and Kennepohl 2008), while only one publication considers the role of such humor in research science in any detail: a single chapter of Gilbert and Mulkay’s (1984) classic study of scientific discourse, *Opening Pandora’s Box* (cf. Mulkay and Gilbert 1982). The authors’ analysis is heavily textual and content based, focusing primarily on humorous science texts like cartoons and parodies of scientific writing that incongruously juxtapose expert and everyday discourses of professional science.

To approach science humor as a decontextualized collection of textual objects, however, overlooks the fundamentally interactional nature of all humor. Research on formulaic joke telling in interaction demonstrates that even highly entextualized forms of humor are not mere bounded texts but dynamic interactional resources, their recontextualization within a new discourse context being necessarily occasioned by and performed within ongoing local interaction (e.g., Chiaro 1992; Norrick 1993; Queen 2005; Sacks 1989). In introducing a joke into discourse, the teller delivers a brief performance for audience evaluation (Bauman 1977), thereby reconfiguring the interactional structure. Although entextualized humor typically originates in a prior context, then, its specific form and function are realized in the moment, rather than traveling intact from one discourse setting to the next. It is precisely because formulaic jokes constitute a genre, or culturally recognizable form of

entextualization, that they are so readily available for recontextualization and transformation through intertextual processes (Briggs and Bauman 1992).

Among science novices, entextualized humor is recontextualized within interaction as part of the ongoing work of peer socialization. To begin with, those who initiate science humor necessarily claim some scientific knowledge and invite a reciprocal display from audience members. Indeed, Sherzer (1985:219) has remarked of formulaic joke telling that a joke operates in part as a “short intelligence test.” Any sort of humor carries risks for initiators as well as recipients, but this risk is especially acute when the humor relies on specialized knowledge. As noted above, the intertextual nature of formulaic humor requires the joke teller to have access to the entextualized joke and hence to be engaged at some level, even peripherally, with the cultural domain in which such texts are available. Telling science jokes is thus an interactional practice that demands knowledge of scientific content as well as knowledge of scientific culture.

Furthermore, for a joke to succeed, both the teller and the audience members must display understanding and appreciation (Sacks 1989). Humor in interaction therefore involves multiple forms of stance taking, an intersubjective communicative action through which participants align (or disalign) with one another (Du Bois 2007). Although analysts have traditionally divided stances into discrete types—epistemic, affective, and evaluative—Du Bois argues that all three types are inherent in stance taking. In his framework, every stance act involves positioning of the speaking subject, which entails both affective and epistemic subjectivity; evaluation of the object of stance; and alignment of the speaker with other social subjects. In the dialogic activity of joke telling, tellers and recipients position themselves epistemically by displaying (or not) the knowledge needed to understand the humor and affectively by displaying (or not) their appreciation of the humor. At the same time, they evaluate the stance object by positively or negatively assessing the joke’s quality. In so doing, social actors stake out alignments relative to one another and thus forge identities of self and other (Bucholtz and Hall 2005; Ochs 1993). This process is especially important for novices, who may thereby claim or disclaim identities as experts in the making, claims that may or may not be ratified by listeners (cf. Jacoby and Gonzales 1991). Formulaic jokes involving a specialized domain such as science, then, serve as a key resource for stance taking and identity construction by allowing speakers and hearers to index their affiliation or disaffiliation with both the formal specialist knowledge and the informal cultural texts of this domain. This identity work takes on even greater significance when, as here, such humor is a valued element of the specialist culture.

A single joke is socially consequential, but patterns of joke telling are even more powerful as they unfold over time. In line with other research that examines how identities are forged along multiple timescales in science education contexts (Bucholtz et al. in press; Lemke 2000; Wortham 2008), this article documents the heterogeneous identities that a peer group in an undergraduate calculus class built over several months via their different patterns of stance taking, or habits of stance, not only toward individual jokes but also toward entextualized scientific humor generally. These differential orientations toward science humor gradually accrued into two distinctive identities vis-à-vis scientific culture: the *scientist in the making*, who claimed both scientific knowledge of and familiarity with the cultural practices of science and hence embraced formulaic science humor, and the *science student*, who was committed to learning scientific content but was not engaged in science as an enterprise or a culture and hence did not embrace such humor. These categories were practical interactional identities that emerged through students’ positioning in relation to classroom activities, both official (solving math problems) and unofficial (telling science jokes); they did not necessarily reflect a difference in students’ abilities or performance in science. The distinction between scientist in the making and

science student was further indicated by students' orientation to these categories in ethnographic interviews. Hence, regardless of other factors, the resources of entextualized joke telling enabled students to stake identity claims in relation to science culture more broadly.

The Scientist Identities Study

The data analyzed below are taken from an ethnographic study carried out from 2006 to 2010, which investigated the role of social interaction in the formation of scientist identities among high-achieving U.S. college students in science majors. The data are drawn from four years of video-based ethnography among undergraduates at California University (a pseudonym). The examples were videorecorded by a fieldworker who collected weekly data for the entire duration of a two-term-long required calculus class; the participants were also interviewed individually.

Students pursued science majors through two different routes: the College of Arts and Sciences, which relied on traditional large lectures and served high-achieving students through its Honors Program; and the Special Program for Undergraduate Research (SPUR), which provided a seminar-based curriculum for students who showed exceptional promise as scientific researchers. The examples are taken from a small-enrollment Arts and Sciences calculus class that closely resembled SPUR and Honors courses in its use of student-centered pedagogies. This introductory-level class fostered interaction among students from various science and nonscience majors, who typically had different goals and trajectories. The class therefore yielded numerous opportunities for negotiating identity in relation to mathematics and to science more generally.

Students in the class formed groups of their own choosing, in which they worked collaboratively while the professor and teaching assistant circulated from table to table to provide help to each group as needed. The group that is the focus of the analysis comprised two SPUR students—Lorie, a math major, and James, a physics major—and three Arts and Sciences students: Harry, an Honors math major; Morrisse, a political science major; and Zoe, an undeclared math major at the time of the recordings. This group was unusually stable and tight-knit, socializing outside of class and remaining together for the entire five months that the course was videotaped. The informal classroom structure and the well-established social relationships among the students fostered a wide variety of talk, including a great deal of humor of all kinds.

This group of students was especially striking for its use of formulaic jokes and other entextualized humor. Formulaic joke telling on any topic was not common in most California University students' casual interactions, and entextualized jokes constitute a small subset of all the forms of science-oriented humor that we documented in our fieldwork; in our observations, it was much more common for graduate students than undergraduates to engage in such joke telling. Yet it is precisely the relative rarity of joke telling among undergraduate students in science, as well as its consequences for interaction and identity, that makes it of special analytic interest, for given the markedness of this practice for scientific novices, it was a strong claim of affiliation with scientific cultures and hence to a scientist identity. In our data, a particular student, James, primarily initiated jokes, but the act of joke telling altered the interaction for all participants, enlisting them in stance taking and identity work as they oriented to the joke in one way or another. The following analysis examines two ways that entextualized humor led to students' positioning in relation to a scientist identity: through stance taking toward scientific knowledge and through stance taking toward the cultural practice of science humor itself.

Stance and Scientific Knowledge

Students in the study positioned themselves epistemically in a variety of ways toward the scientific knowledge they encountered in their classes, displaying everything from long-standing mastery to sudden understanding to outright confusion. And because students engaged in science not only cognitively but also emotionally, their stances toward scientific knowledge involved an affective component as well (Goodwin 2007). This range of positionalities was likewise central to science humor, as students indexed their understanding or nonunderstanding of the science behind the joke. In so doing, they claimed a relatively more expert or more novice identity in the wider scientific culture from which the joke was intertextually sourced. This process is illustrated in Example 1. The joke teller is Morrissette, a political science major who did not usually position himself as having a strong scientist identity; in fact, this is the only joke he told in our data set:²

Example 1. "Electrons" (Inquiry-Based Calculus: April 25, 2007)

(1) "Electrons" (Inquiry-Based Calculus: April 25, 2007)

- | | | | |
|----|--------------|---|---|
| 1 | Morrissette: | Okay. | <strikes Zoe's paper with pen> |
| 2 | | So there are these two <u>neutrons</u> . | <looks at Zoe, smiling; Zoe smiles, looking at pen/paper> |
| 3 | | They're walking along. | |
| 4 | Zoe: | <[tʰ]>! @@@ | <lowers head to desk> |
| 5 | Morrissette: | They <u>bump</u> into each other. | |
| 6 | | So this guy was like, | <Zoe raises head, smiling> |
| 7 | | "He:y. | <smiling at Zoe> |
| 8 | | (0.8) | |
| 9 | | I <u>think</u> you have one of my electrons." | <points at Zoe> |
| 10 | | (So) the other guy goes, | <Zoe nods, smiling> |
| 11 | | (0.6) | |
| 12 | | "Are you <u>sure</u> ?" | <ducks head, looking at Zoe> |
| 13 | | He says, | <smiling at Zoe> |
| 14 | | "^Yea:h. | |
| 15 | | (0.5) | |
| 16 | | Pos:itive." | |
| 17 | | (4.7) | <Zoe laughs silently, hunching over; Morrissette pantomimes a punch; James smiles, writing> |
| 18 | Morrissette: | [Swish::.] | <pantomimes a basketball shot> |
| 19 | Zoe: | [@@@] | <clapping> |
| 20 | | (Very good.) | <clapping> |
| 21 | | ^h:: .h: ^Ho:::.....h.= | <turns back to her paper> |
| 22 | Morrissette: | <creaky> =[I ## ro:ck.]= | <smiling at Zoe; jiggling leg> |
| 23 | James: | =Jesus Chri[st, | <smiling and looking at his paper> |
| 24 | | (dude.) | <shaking head> |
| 25 | | I cannot=] | |
| 26 | Zoe: | [@@ Tha@t was ri@di@culou@s!] | <leaning forward and lowering head to table> |
| 27 | James: | =believe you just said that. | |
| 28 | Zoe: | ^@@@[@@] | <raises head> |
| 29 | James: | [Wo::w.] | <Zoe turns to look at Morrissette> |
| 30 | Morrissette: | <creaky> {(That shit) fucking <u>rocks</u> ::!} | <pantomimes punch; Zoe pounds table> |
| 31 | James: | Wo:w, | <rubs eye, looking at paper> |
| 32 | | du:de. | |
| 33 | Morrissette: | @@ | <looking at Zoe> |
| 34 | | | <Zoe lowers head, laughing> |
| 35 | James: | <sniffs> [^Okay.] | <shakes head> |
| 36 | Zoe: | [This is why@] I can't get anything done. | <raises head; waves left hand> |

Morrisse's joke is a variation of a narrative joke that is widely known among professional scientists as well as science students. For him to tell the joke and the others to respond appropriately, all the participants must possess an understanding of atomic phenomena. However, the joke relies on a rather elementary level of scientific knowledge that most students gain in high school chemistry; either this fact or the pun in the punchline (or both) may be the reason for James's extended mock-disapproving response beginning in line 23. In addition, Morrisse's excessive self-congratulation (lines 17–18, 22, 30) is clearly ironic, rather than sincere. Zoe aligns with both students: she supports Morrisse's exaggerated display of accomplishment by applauding and praising him (lines 19–20), and she overlaps with James, exclaiming, "That was ridiculous!" (line 26), while laughing extensively throughout. Finally, she complains that Morrisse's joke telling is a distraction from her work (line 36). Through these responses, all of the participants (playfully) negatively evaluate the joke and its insertion into the interaction.

Despite the rudimentary level of scientific knowledge required to understand the joke, Morrisse in fact botches the underlying science: a neutron, as part of the nucleus of an atom, does not contain electrons. The usual version of the joke involves two atoms; the punchline hinges on the fact that an atom may lose an electron and become positively charged.³ Yet none of the students appears to orient to this error. They may have not noticed it, or they may lack the scientific knowledge to recognize Morrisse's faulty entextualization of the joke's wording. In either case, in not commenting on the science behind it, the participants treat the joke as scientifically comprehensible, even as their mocking responses indicate their low evaluation of its quality (admittedly, in the genre of joke telling, such playful negative evaluation expresses a kind of appreciation for a "bad" joke). The students index a basic degree of scientific expertise by orienting to this joke as silly, rather than puzzling; as shown in the next set of examples, the latter response may arise when a joke relies on more advanced science. Here, a display of expertise is possible even for those who lack detailed scientific knowledge of the structure of the atom, as long as they have—or feign—a passing acquaintance with the notion of atomic charge.

Other instances of entextualized humor demand more advanced scientific knowledge and thus more extensive identity work from participants. In Example 2, which takes place more than two months before Example 1, the joke teller is James. The teaching assistant Allen and the professor are also present for parts of the interaction. When the professor approaches and observes the group's work, James launches the joke.

Example 2a. "Lambda" (Inquiry-Based Calculus, February 12, 2007)

1	James:	What do you call an eigensheep?	<twirls pen, looking across table>
2		(0.8)	<Zoe, Morrisse, Harry, and the professor look at James; Allen turns to James; Zoe and Morrisse smile>
3	Zoe:	[₁ @ ₁]	
4	James:	[₁ A ₁] la:mbda.	<Allen steps nearer; Zoe, Morrisse, Harry, and the professor smile>
5	Harry:	@@@	<The professor turns and moves away, smiling; Allen steps back>
6	Lorie?:	@	<Lorie chin-points toward the professor; first Morrisse, then Harry, then Zoe turn to look at him>
7	Zoe:	@@[₂ @@^@ ^.h ₂]^@@	<turning back to the group and then to watch the professor>
8	Lorie:	[₂ @@@@@]	<Harry points pencil at professor>
9	Harry:	[₃ @@ ₃]	
10	Zoe:	[₃ @^h ₃]@@@@.h! @@@h::	<lowers head, tapping pencil>
11	Harry:	Oh [₄ dear. ₄]	<looks down at paper>
12	Zoe:	[₄ .h:: ₄]	<lifts head>
13	James:	Terrible joke.=	<turns toward Harry, smiling>

14	Zoe:	=I can't believe you just bu@sted that ou@t.	<looks at James, then leans over paper>
15	Harry:	I know.	
16		(Kee@p it se:cr@et.)	
17	Morrisse:	He's got to get it [₅ (somewhere.) ₅]	
18	Lorie:	[₅ O::h! ₅]	
19	Zoe:	[₅ @^@ ₅]@@	<pointing at Harry with pencil>
20	Allen:	James,	<approaching the table>
21		you're probably supposed to say,	<All students turn toward Allen>
22		"A ^la:mb.	
23		[₆ Du:h." ₆]	
24	James:	[₆ Du:h. ₆]	<gesturing toward Allen with right palm open, face up>
25		Yeah.	
26	Harry:	[₇ O:h yeah. ₇]	<smiling, looking down at paper>
27	Lorie:	[₇ @@ ₇]	
28	Zoe:	[₈ @:@@@@@ ₈]	<looking at Allen>
29	James:	[₈ (It probably would have ₈)=	<turns head to right, toward the professor?>
30		=when he was [₉ h:e:re) ₉])	
31	Zoe:	[₉ @@@: ₉] @^@!	<points at James with pencil, then tilts head back>
32	Harry:	La:mb,	
33		[₁₀ du:h. ₁₀]	
34	Lorie:	[₁₀ @@ ₁₀]	<Allen moves away>
35	Harry:	[₁₁ @@ ₁₁]	
36	Zoe:	[₁₁ @@ ₁₁]	
37	Harry:	Oh Zo[₁₂ e. ₁₂]	

When James introduces the joke (specifically, a riddle) in line 1, other members of the group swiftly orient to him, lifting their eyes from their papers. The professor, who may be the primary recipient of the joke given the apparent direction of James's gaze, and the teaching assistant Allen, who is standing a slight distance away, also direct their eyes and bodies toward James's group, embodying the role of listeners. Additionally, both Morrisse and Zoe smile, possibly recognizing the distinctive opening of a formulaic joke. (Lorie's back is to the camera, so it is difficult to determine her actions here and throughout the interaction.)

Like the joke in Example 1 above, a version of this riddle circulates among students of science as well as professional scientists; however, compared to the previous joke, it requires relatively more advanced mathematical knowledge (specifically, concepts introduced in college-level calculus). The humor derives from the fact that the Greek character λ (lambda) is used to represent the eigenvalues of a matrix. The joke relies on a pun between the phonological similarity of *lamb* and the first syllable of *lambda*; in most entextualizations, the riddle is *What do you call a young (or baby) eigensheep?*, a phrasing that provides a clearer motivation for the punchline. After James tells the joke, Harry and Lorie laugh a bit and Morrisse and Zoe maintain their smiles, but when the professor smiles and walks away, the others laugh harder, and Lorie and Harry point toward him, playfully framing his departure as a negative evaluation of the joke.

The group members immediately become more critical in their evaluations: Harry says "Oh dear," James himself comments that it is a "terrible joke," and Zoe expresses surprise at James's unexpected joke telling (lines 11–14). At this point Allen approaches the group and critiques James's delivery of the punchline, offering his own, rival, entextualization. By inserting a pause between the first and last syllable of *lambda* and accentuating the second syllable, Allen enhances the humor of the joke, reparsing the punchline to include

the kicker *Duh* (line 23), an expression of derision directed at someone who misses an obvious truth. James chimes in with Allen (line 24), signaling both through his cocompletion of the latter's turn and through explicit agreement in the following line that Allen's suggested delivery is the appropriate one. Immediately afterward, Harry also agrees (line 26) and replays the improved punchline (lines 32–33). These three participants display a certain connoisseurship regarding how the joke should be told; here it is not the entextualized joke that is the stance object but James's performance of it. Compared to Example 1, the identity stakes are now higher, for James has told the joke in the presence of the professor and teaching assistant, who hold greater scientific expertise, and his bungled joke telling, unlike Morrissette's, becomes a focus of expert critique (although James is able to partly recover from this loss of social face by rapidly aligning with Allen's comments).

The lively participation of all group members in response to the joke may suggest a shared knowledge of its mathematical underpinnings, but Zoe goes on to confess that she does not in fact understand it (line 38). (In a separate, largely unintelligible conversation, omitted here, James tells Morrissette and Allen how lambda came up in his physics class the previous day.)

Example 2b. "Lambda" (Inquiry-Based Calculus, February 12, 2007)

38	Zoe:	[₁₂ And ₁₂ I don't get it at a@@@ll.	<waves pen; lowers head to table>
39	Harry:	You don't get it?	<looking at Zoe>
40	Zoe:	No@.	<raising and shaking her head>
41	Harry:	What don't you get?	
42		It's not la:mb,	<nods head emphatically>
43		du:h,	<nods head emphatically>
44	Harry:	It's la:mbda:.	<shrugs, looks at Zoe>
45	Zoe:	@ I@ do@n't kno@w what-	<tilts head back, then looks at Harry>
46		I don't know what ei@genvalue i@s.	<gestures with right palm up, bends over table>
47	Harry:	[₁₃ O@@@h,	<shaking head>
48		m@@e@ neither. ₁₃]	
49	Zoe:	[₁₃ ^h! @@ ₁₃]	<raises head; points pen at Harry>
50	Harry:	[₁₄ It's still funny though. ₁₄]	<nodding>
51	Zoe:	[₁₄ @h! ₁₄]	<raises right hand to nose>

Harry initially interprets Zoe's utterance as meaning that she does not understand Allen's critique of James's delivery (but he appears to muffle his explanation; lines 42–44). Zoe clarifies, confessing that she does not know what an eigenvalue is (lines 45–46); this concept was introduced to the class two weeks earlier but has not been discussed on the day that this interaction takes place. But despite her disavowal of the knowledge necessary to appreciate the joke, she is in fact able to produce the mathematical term *eigenvalue* from which the humor derives as well as to link it to the playful concept of an "eigensheep." In response, Harry admits that he does not know what an eigenvalue is either, but asserts that he nonetheless finds the joke funny (lines 48, 50). Indeed, aside from the fact that the humor relies on some familiarity with calculus, the only mathematical knowledge required to appreciate the joke is the recognition of an association between the terms *lambda* and *eigen(value)*; no detailed understanding of the nature of these concepts is required.

Despite their shared epistemic positionality of not understanding the joke's underlying mathematics, the two students' stances involve very different affective and evaluative orientations: Zoe seems to imply that her lack of specific mathematical knowledge keeps her from appreciating the joke, while Harry states that he is able to enjoy it without such

knowledge. A similar stance differential (Du Bois 2007) can also be seen elsewhere in the interaction, with Harry repeatedly evaluating the joke and Zoe laughing at interactional aspects of the joke telling, without specifically orienting to the joke itself. Through their stance taking, the two students take steps toward staking out what emerged, later in the class, as clearly different identity positions. Until exposed by his admission to Zoe, Harry implicitly claims some basic degree of scientific expertise by signaling appreciation of the joke's humor, while Zoe does not lay claim to such expertise at any point in the sequence, in spite of her extensive involvement in the interaction and her apparent possession of at least as much scientific knowledge as Harry. This difference, then, is not simply a matter of understanding the relevant mathematics. In fact, elsewhere in our data students who strongly positioned themselves as scientific experts readily admitted lack of understanding in classroom discussions, but they typically did so by debating others' knowledge claims or otherwise asserting knowledge of their own. Zoe does not use such strategies to mitigate the potentially self-damaging admission that she does not understand the joke, nor does she employ Harry's strategy of evaluating the joke's humor, which implies a claim to understanding. As the final set of examples demonstrate, this variability in stances toward entextualized science humor ultimately consolidated over time into differential novice identities: as a scientist in the making, on the one hand, and as a science student, on the other hand.

Stance and Scientific Cultures

If displaying understanding of the concepts involved in science humor allows novices to construct an expert identity by indexing formal scientific knowledge, then displaying familiarity with specific humorous texts enables them to construct an insider identity by claiming knowledge of the informal practices of scientific cultures where such texts proliferate. The final example illustrates this phenomenon and demonstrates how students' different habits of stance toward science humor may be associated with their larger orientations to science.

Example 3 takes place during the next class meeting after the one in which Example 1 occurred. The professor has been discussing "the Noah's ark problem" as an illustration of how to apply the second derivative test to a function. As the professor finishes his remarks, James looks across the table at Zoe, apparently soliciting her as recipient, and says, "Since we're on the topic of Noah's ark, I have to tell a math joke."⁴ The example begins toward the end of the joke:

Example 3a. "Noah's Ark" (Inquiry-Based Calculus, April 27, 2007)

21	James:	=So Noah sure enough pulls out his,	
22		axe,	<waves right fist>
23		and [2cuts down the tree, 2]	<chops with right hand>
24	Harry:	[2O::h,	
25		^I've heard this.2]	<long blink, nodding>
26	James:	and he chops it [3into little 3]=	<chops with right hand>
27	Harry:	[3Very good.3]=	<nodding>
28	James:	= pieces,	<grasps pen with hands>
29		And he comes back like a week later,	<opens left palm, flips pen with right hand>
30		and the snakes are doing their thing,	<waves with left hand>
31		An:d,	
32		after a while he realized that they were	<strikes table with left palm, twirling pen
		addrs,	with right hand>
33		so they needed logs to multiply?	<strikes table with left palm>
34		h:	

As James moves toward the punchline, Harry overlaps with him, thus registering his familiarity with the joke (lines 24–25). This epistemic position of knowledgeable is simultaneously a claim to some degree of membership in the wider scientific culture in which the joke circulates. Harry then provides a positive evaluation of the joke, even before James delivers the punchline (line 27), implicitly inviting the others to share his evaluation. (The punchline in lines 32–33, which relies on high school-level mathematics, involves puns between mathematical and nonmathematical interpretations of the terms *adders*, *logs*, and *multiply*.) Through his overlapped and anticipatory comments, Harry displays his independent knowledge of this joke.

Despite Harry's efforts to cue the others' positive evaluation of James's joke, they show a marked lack of appreciation in a variety of ways (Bell 2009):

Example 3b. "Noah's Ark" (Inquiry-Based Calculus, April 27, 2007)

35	(1.0)		<All look at Zoe; Harry and Morrissse smile slightly>
36	James:	h::	
37		(1.0)	
38	Morrissse:	[₄ They were what? ₄]	<turns to James, twirling pen with right hand>
39	Zoe:	[₄ You're ridicu ₄]lou@! ₅ [₅ @@@ ₅]	<twirling pen with right hand; Lorie smiles>
40	James:	[₅ They were ₅ adders.	<turns to Morrissse; strikes table with left palm>
41		h	
42		So they need the logs to multiply,	<strikes table with left palm; Lorie furrows her brow>
43		.h: h:	<Harry and Morrissse look at each other and nod; Morrissse grimaces>
44	Harry:	<sing song> I [₆ say that's an impossible math ₆][₇ emtical (situation.)] ₇	<turns and gestures toward Lorie, strikes table; Lorie smiles; James looks at Lorie, smiling>
45	Morrissse:	[₆ <click> Anyways. ₆]	<turns away from table>
46	Zoe:	[₆ You are ridiculo ₆][₇ us.	<James drums on notebook>
47		Yea@@h! @^@@ ₇	<turns head to Morrissse>
48	Morrissse:	[₇ I have a quick question.	<holds out paper and chin-points to professor? off camera>
49		<lower volume> {Real quick.} ₇	<wrinkles nose; holds thumb and finger slightly apart>
50	Harry:	Very ^good!	<nodding; Lorie smiles>
51		(2.3)	<Morrissse leaves table; Zoe turns and watches him; James continues drumming>
52	Harry:	A:h.	<looks over left shoulder>
53		You got that on tape too.	<points at James>
54		Nice.	<nodding, smiling; James nods>
55		That's solid.	<looks over left shoulder>

James's delivery of the punchline is greeted by a full two seconds of silence, rather than laughter (lines 35–37). Zoe laughs in her next turn (line 39), but only after negatively evaluating James, an indication that her laughter is more playfully mocking than genuinely appreciative. Meanwhile, Morrissse, in overlap with Zoe, initiates other-repair using an echo question (line 38); the strong emphasis that he places on *what?* appears to display a lack of understanding, rather than indicating difficulty hearing the punchline. After James repeats the punchline without further explanation (lines 40, 42), Morrissse and Harry look at each other and nod, Harry vigorously, but Morrissse only slightly, first with his lips pressed together and then with a slight grimace. His embodied stance may index understanding—or perhaps resignation toward James's joke telling—but it visibly does not index appreciation. Further, the stand-alone change-of-topic marker *Anyways* (line 45)

that Morrisse uses to set up his departure from the group often functions as a stance marker that dismisses the current topic as undeserving of further comment; Zoe's amused reaction in line 47 indicates that she interprets the form in this way.

As in Example 2, Harry and Zoe take very different stances toward the joke. Simultaneously with Morrisse, Zoe mock-negatively evaluates James, positioning him and not the joke as the stance object (line 46), while Harry first appears to comment jocularly on the implausibility of the joke's underlying mathematics (line 44) and then repeats his positive evaluation of its humor (line 50). Finally, he approvingly notes that the joke has been captured by the videocamera (lines 52–55). Thus, Harry continues to signal epistemically, affectively, and evaluatively both his familiarity with the joke and his understanding and appreciation of it, despite the other students' persistent lack of alignment with his stance.

The students' different orientations to science humor continue in the next part of the interaction. In Example 3c, the discussion shifts from the joke that has just been told to one that James told over two months earlier (Example 2 above):

Example 3c. "Noah's Ark" (Inquiry-Based Calculus, April 27, 2007)

56	James:	Didn't butcher it as badly as I did the la:mbda joke,	<turns to Harry, smiling; opens left palm; flips pen with right hand>
57		s:o [s:he:y. s]	<strikes table with left palm, shaking head>
58	Harry:	[s:A:h,	<turns head to right>
59		thes] lambda.=	
60	Zoe:	=Tha@t (is/was) so—	<leans over table; James looks at Zoe>
61	Harry:	What do you call a;:=	<thumb-points at James>
62	Zoe:	=^h h::	<sits up; tosses head and leans head on left hand>
63	Harry:	I don't remember what it is.	<bounces right hand twice>
64	Lorie:	What if I think [9(six point f) 9]	<looks at Harry>
65	Zoe:	[9^@@ 9]	<strokes hair>
66	Harry:	[9What do you call a baby9] v- <u>vector</u> sheep,	<glances at Lorie, then looks at James>
67		or an eigensheep,	<chin-point, eyebrow flash; James taps notebook>
68		ri:ght?	
69	James:	Yeah.=	
70	Harry:	=Baby ei[10gensheep (or—)10]	
71	James:	[10What do you call an ei10]gensheep?	<flips pen in right hand; Lorie turns head to James>
72		[11A la:mb,	<drops pen on notebook; rolls eyes; smiles>
73		du:h.11]	<lifts right hand, palm up>
74	Harry:	[11A la:mb,	<rubs right cheek; smiles>
75		du:h.11]	
76	Zoe:	@@	
77	Lorie:	^U:::h!	<Lorie smiles widely at Zoe with eyebrows raised; opens mouth; all look at Lorie>
78	Harry:	Go on.	<extends palm to Lorie>

In light of the less than complete success of his telling of the Noah's ark joke, James's invocation of the lambda joke may again be a face-saving move. Moreover, his reactivation of the previous joke in the current context together with Harry's display of recognition indexes these two students' shared engagement with science jokes. James and Harry align with each other and collaborate in the joke telling, but they also produce somewhat different and perhaps competing entextualizations of the earlier joke. James initially mentions "the la:mbda joke" by its punchline in line 56 to evaluate his current joke-telling performance, rather self-deprecatingly, as superior to his previous performance. Harry in turn signals his recognition of the joke that James is referring to and then tries to recall its wording. After aborting his initial attempt (line 61), he produces a possible entextualiza-

tion, for which he seeks and receives confirmation from James, and then offers a reformulation (lines 66–70). Yet the wording that he proposes and James confirms is different both from James's original entextualization and the one that James goes on to produce: *What do you call an eigensheep?* (line 71). Harry's version, *What do you call a baby eigensheep?* conforms with the more typical text of this joke. Because James's original telling did not include the same formulation, Harry must have either encountered the joke elsewhere or devised this phrasing on his own; in either case, he displays independent knowledge of the joke. Thus, even as Harry's stances yield epistemic authority to James (Heritage and Raymond 2005), he also repeatedly offers his own alternative text, thereby indexing his own claim to insider knowledge of a widespread entextualized joke within science culture.

Zoe and Lorie, unlike their peers, here display little interest in joke telling. Although both were present at the earlier telling, they do not join in the collaborative activity of recalling and recontextualizing the joke. Zoe reacts to James's initial mention of the lambda joke with an amused outburst (line 60), and she laughs again after James and Harry deliver the punchline (lines 72–75), but because her back is to the camera, it is not clear that her laughter indicates appreciation for the joke. Indeed, her stance seems gently mocking, as in previous examples, given her truncated but emphatic evaluation (line 60: *Tha@t (is/was) so—*) and her laughter as Harry attempts and fails to retell the joke (lines 62, 65). Moreover, she and Lorie build an alignment against the others' joke telling. At one point, Lorie starts to ask Harry a math-related question (line 64), but he is talking to James and does not respond. After the two men chorally recite the joke's punchline, Lorie turns to Zoe with a look of mock horror and groans (line 77).

This stance differential continues after the interaction in Example 3c. Following an exchange between Lorie and Harry about her question, James reopens the topic of joking, mentioning a math journal he has seen in Allen's office that has "a collection of all the like, bad math jokes in it"⁵ Harry displays interest, saying, "Oh yeah?" and Zoe laughingly replies, "Oh god. . . . No one should have ever given that to you." Lorie turns briefly to James but soon returns to her classwork, which she works on for the rest of the interaction. Thus, in multiple ways, James and Harry display deep and sustained engagement in joke telling as an informal scientific activity, while the others show far less commitment to and interest in this cultural practice.

Discussion

As the preceding examples illustrate, throughout the calculus course, the students in this study group had sharply contrastive habits of stance toward science humor. James was the primary teller of science-related jokes, and among the recipients only Harry showed great appreciation for such humor. Moreover, while both James and Harry were highly engaged with science jokes, they played complementary roles, with James telling the jokes and Harry evaluating them. Likewise, Lorie and Zoe took up similarly distanced stances in relation to these jokes, but they did so in different ways: Zoe contributed to the interaction extensively through laughter and discussion, but she did not display straightforward appreciation for the jokes themselves, while Lorie participated minimally, focusing mainly on her math homework. Morrisse did not display a consistent stance toward science jokes throughout the course; although he initiated one joke, he participated only minimally or mockingly in most instances of science humor.⁶

These habits of stance built up over time into heterogeneous identities regarding science. Through their repeated displays of knowledge of both scientific content and scientific cultures via entextualized humor, James and Harry habitually positioned themselves as scientists in the making while Zoe, Lorie, and Morrisse generally positioned themselves as science students. It would be a mistake, however, to conclude that these

three students were less concerned with science. At various points (line 36 in Example 1; lines 48 and 64 in Example 3), each displayed a focus on what might be called “the serious side of science education”—getting their homework done—rather than joke telling. Meanwhile, James and Harry’s orientation to science humor led to a less consistent focus on work tasks, even as they displayed scientific expertise and insider status. And although the others sometimes framed joke telling as a distraction, such exchanges were licensed by the student-centered nature of the classroom, as indicated by the participation of the professor and the teaching assistant in some joke-telling sequences.

In addition to students’ displays of their identities as either scientists in the making or science students through their habitual interactional practices, our ethnographic interviews with individual students provide further insight into their orientation to science. Harry, for example, reported that he read math books for fun and enjoyed designing computer games, and James indicated a strong orientation toward professional science, announcing that he had decided to switch his major from physics to biology to pursue a career as a biomedical researcher. Meanwhile, both Lorie and Zoe said that they did not seek out mathematical or scientific experiences beyond what was required for their coursework. Lorie remarked that she did not like any science other than math, and Zoe complained that although “being politically active is very important” to her, her chosen major, mathematics, “doesn’t relate to the outside world.” These different priorities were also borne out by these students’ later trajectories: Zoe ultimately switched to an environmental science major, and Lorie left SPUR to become a philosophy major in the College of Letters and Science.

To be sure, formulaic science humor is only one resource for constructing a scientist identity, and professional humor is not unique to the sciences. But telling entextualized science jokes of the kind analyzed above was an important opportunity for both tellers and recipients to align or disalign with scientist identities, both because it was an unusual practice among California University undergraduates and because it drew on knowledge of scientific content as well as scientific culture. Indeed, the use of science humor for cultural membership also arose in an interview with a Letters and Science math student in the larger study, who stated that students who major in math must appreciate “some really weird math jokes” and find “humor in some of the most nerdiest things.” Telling entextualized science jokes oriented to both the formal and informal practices of professional science cultures, to which students gained access via websites, peers and instructors in science classes, and even academic journals that publish entextualized science jokes. As such students rehearsed, reproduced, and relished science jokes, they also positioned themselves as relative insiders in scientific cultures.

Conclusion

The preceding analysis has shown that the performance of entextualized science humor in interaction is an important resource for identity formation and peer socialization among scientific novices. Although this study has focused on scientific newcomers’ adoption of a particular discourse genre, the central role that entextualization plays in preparing novices to take up fuller cultural membership is not restricted to formulaic joking within science but, rather, is a much more general process for socialization into the practices, both official and unofficial, of all institutional cultures that are centrally oriented to text and inscription.

In the specific case of entextualization and socialization that has been analyzed here, telling science jokes functions as a way for novices to display knowledge of scientific content and scientific cultures and to invite (or compel) others to reciprocate by taking epistemic and evaluative stances toward the joke, thus achieving intersubjective alignment. Particularly among scientific novices, then, a science-themed joke is quite literally a “short intelligence test”—but perhaps more importantly, as Norrick (2003) points out, it is

also a test of shared values and interests. Furthermore, the act of telling or enjoying such a joke constructs a stance toward science as a pleasurable, rather than a burdensome or daunting, activity. Far from being a distraction from the serious work of doing and learning about science, telling science-related jokes is itself part of becoming socialized and socializing others into scientific cultures.

The interactional stances that students in our study took toward science humor involved a wide array of positionings, evaluations, and alignments. Over multiple joke-telling events across several months, these habits of stance accrued into more enduring identities either as scientists in the making—knowledgeable and engaged members of a scientific culture—or as science students, who sought to do well in their classes but did not see themselves as deeply invested in science more generally. These identities did not reflect students' scientific knowledge or academic performance in any straightforward way. Rather, it was students' orientation to the informal practices of professional scientific cultures, not their scientific expertise, that was most strongly associated with the formation of an identity as a scientist in the making.

The task of identity construction may be especially important for novices in science, but it does not end when members of scientific communities achieve the status of experts. Humor remains an important resource for displaying scientific identities throughout scientists' professional careers. Although largely unaddressed in studies focusing on the official business of science, scientific humor, no less than hypothesis formation and testing, measurement, proof, and other normatively core scientific practices, promotes the goals and values of science and helps constitute novices and experts as part of a shared undertaking. For students just embarking on the study of science at the undergraduate level, humor is an interactional resource for stance taking that allows them to claim—and sometimes to refuse—fuller cultural membership.

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1. For the purposes of this article, we define *science* as encompassing the biological, physical, and mathematical sciences.

2. Transcription conventions (each line represents one intonation unit): period . end of intonation unit, falling intonation; comma , end of intonation unit, fall-rise intonation; question mark ? end of

intonation unit, rising intonation; exclamation point ! raised pitch and volume; caret ^ pitch accent; **underline** emphatic stress, increased amplitude, careful articulation of a segment; colon : length; equals sign = latching; dash — self-interruption, break in intonation unit; hyphen - self-interruption, break in word, sound abruptly cut off; numbers in parentheses (n.n) measured pause; "at" sign @ laughter, each token marks one pulse; lowercase H h outbreath (e.g., sigh); period and lowercase H h inbreath; square brackets [] overlapping speech; parentheses () uncertain transcription; slash mark / alternate hearings; angled brackets < > transcriber comment; curly brackets { } stretch of talk to which transcriber comment applies; combined angled and square brackets < []> phonetic transcription; quotation marks " " reported speech or thought.

3. We encountered the more usual entextualization of this joke as well as of the riddle in Example 2 on science humor websites; we were also told the conventional version by science graduate students and faculty when we shared our research with them.

4. The fact that Zoe was often a primary recipient of the men's formulaic joke telling may suggest that heterosexual flirtation is involved in these interactions in addition to other identity work.

5. James specifies that the journal is the *Notices of the American Mathematical Society*, a publication of a professional math organization. His knowledge and fluid production of this title, which undergraduate students rarely encounter, further displays insider cultural status.

6. These patterns may indicate that gender is a factor in students' orientation to science humor, but it is difficult to make any convincing claims in this regard because of the small number of students and the heterogeneity of their interactional practices and identity positions.

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