

RAISE YOUR VOICE: EXPERIENCES OF SILENT STUDENTS IN THE
CLASSROOM

A THESIS

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By

Alessandra F Moss

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Alessandra F Moss

Signatures:

Tabitha Holmes (Adviser)
Insert Adviser's Name

Alison Nash
Insert Reader's Name

Doug Maynard
Insert Reader's Name

May 8, 2020
Date Approved

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York at New Paltz in Partial Fulfillment of the Requirements for the
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ABSTRACT

Class participation may be an important part of students' learning process, but many students remain silent in college classrooms. This study was a qualitative inductive inquiry exploring the classroom experiences of students who rarely participate in class. Fourteen semi-structured interviews were analyzed using coding methods adapted from grounded theory to gain insight into students' opinions about class participation, their class participation habits, and beliefs about knowledge in general. Primary themes that emerged were wanting to avoid being wrong and experiencing anxiety, nervousness, or related physical symptoms as reasons not to participate. Students also articulated mostly engaging in low stakes participation, when the risk of being wrong was minimal, primarily when they felt prepared to answer correctly. A variety of beliefs about knowledge were articulated, including, knowledge comes from external authority, and knowledge comes from scientific research, evidence, replication, and consistency. No strong connections were found between beliefs about knowledge and class participation habits. Practical implications for educators and future directions are discussed.

INTRODUCTION

This project was inspired by my increasing suspicion that there is a disconnect between the way educators and some students, the quiet ones in particular, understand and experience the classroom setting. As a graduate teaching assistant at SUNY New Paltz, I encountered numerous occasions where students' classroom behavior was so counter to my expectations that I could only revel in the mystery of what motivated their actions.

There was one particular class period in which I was continuing a previous lesson: explanation of the independent samples t-test. I explained the formula, wrote down the values we had calculated for the standard deviations from the last meeting, and the class spent about twenty minutes calculating the t-statistic by hand. After I went over the answer on the board, a student sheepishly raised her hand and said, "Isn't the standard deviation for group one supposed to have 5 digits in it instead of 4?" I had written down the incorrect number. This student had likely realized this fact as soon as I had written the number down, but she had waited until the end of the lesson to question me. What was it about that situation that she felt she could not ask immediately? What kind of thinking processes had motivated her to wait until the lesson was over to correct my mistake?

These and other questions were the driving force behind this inquiry. In my undergraduate psychological statistics and research methods classes, I had some students in class who regularly participated, and I often felt that I had a pretty clear understanding of how they were absorbing and interacting with the material in the course. But there were others who sat silently and spoke only a few times during the semester. These students remained a mystery to me. My goals in this thesis were to explore the

experiences and beliefs of students who sit quietly, listening, but who might not say a word all semester. Why did these students fail to answer questions or contribute their own opinions? What were their experiences of the classroom setting? And how were they thinking about the knowledge they were gaining and the professors lecturing in the classroom? These questions are important because, in our western academic paradigm, participation is often encouraged and valued, and students who are not speaking up may be at a disadvantage. Asking quiet students directly about their experiences may offer novel information for instructors to explore how to better support their learning.

Class Participation

Class participation is an important part of a student's academic experience throughout his or her collegiate career. Carstens, Ciancio, Crabtree, Hart, Best, Trant, Jaquett, Adair, & Williams (2016) define class participation as "any content-related comment, including questions, responses to questions, and expressed views regarding discussion topics" (Carstens et al., 2016, p. 181). They argue that participating in class can help students develop communication skills that will likely remain beneficial to them throughout their careers (Carstens, et al., 2016).

In fact, research has shown that higher quantity and quality of class participation are linked to better academic performance in both online (Duncan, Kenworthy, & McNamara, 2012) and in person classes (Carstens, Wright, Coles, McCleary, & Williams, 2013; Carstens et al., 2016). And indeed, many college syllabi factor class participation into students' final grades.

Despite its potential benefits, and educators' attempts to foster it, class participation can be low, particularly in larger classes (Ahlfeldt, Mehta, & Sellnow,

2005). And often, it is a small number of students who participate regularly (Karp & Yoels, 1976). Many students at SUNY New Paltz feel hesitant or reluctant to participate in class. In a pilot study I conducted, 43 out of 94 students taking an entry-level undergraduate Psychology course reported that they seldomly spoke in class, while eight students confessed that they *never* participated. In contrast, 25 reported that they participated about half the time and only 18 indicated that they participated in class often.

Researchers have explored a number of possible explanations for lack of participation. Self-reported reasons for non-participation have included inadequate preparation, or not having enough knowledge about the topic under discussion (Karp & Yoels, 1976). Additionally, low participation can be explained by lack of confidence or being afraid of the disapproval of their peers (Weaver & Qi, 2005).

The behavior of the professor may also influence a student's propensity to participate. Researchers found that aspects of professor-student rapport such as professor's friendliness or flexibility are predictors of students' academic motivation and achievement (Wilson, Ryan, & Pugh, 2010). Carstens et al. (2016) argue that if teachers use a "collaborative style" (Carstens et al., 2016, p. 181) and show they value class participation by encouraging students to speak and giving positive feedback, students will be more likely to participate (Carstens et al., 2016). Interestingly, Weaver and Qi (2005) found that a predictor of class participation was a student's interaction with faculty outside of the classroom, including email communications and discussions about the course (Weaver & Qi, 2005).

Researchers also found a significant negative relationship between students' views of the "*professor as the authority of knowledge*" and class participation (Weaver &

Qi, 2005). Their measurement of this student attitude included two items, which were rated on a 5 point Likert-type scale: “In the teaching and learning process I ... 1) view the professor as the authority and my role is to absorb the knowledge he/she provides. 2) won’t openly question the professor’s views in regard to course material” (Weaver & Qi, 2005, p. 598). These particular questions are targeted at understanding how students relate to professors as sources of knowledge in the classroom and are reminiscent of some of the inquiries conducted in the field of epistemological development. The above findings suggest that how students think about those who are imparting knowledge to them may be linked to their amount of class participation. Part of the current study was an attempt to explore more broadly possible patterns between students’ beliefs about knowledge and the authorities who profess it, and their class participation habits. To gain an understanding of the ways in which researchers have explored how people think about knowledge, I turned to the field of epistemological development.

Epistemological Development

Epistemological development explores topics such as the theories (or assumptions) people have about knowledge, how they arrive to believe something is true, and how these kinds of knowledge attaining strategies influence the way they reason or think (Hofer & Pintrich, 1997). Many models of epistemological development are described as stage theories that articulate a series of epistemic positions that one progresses through over time and with experience (Greene, Cartiff & Duke, 2018). These models describe people’s orientation towards knowledge along one dimension (Greene Cartiff & Duke, 2018), which means they assume that people will experience having one dominant attitude towards knowledge as a whole throughout a particular stage; this is

sometimes referred to as a unidimensional approach (Duell & Schommer-Aikins, 2001). An example of a unidimensional stage theory is Perry's (1968) model where college males progressed through nine stages of development. Perry posited that students start at an initial position where they believe knowledge is absolute and consists of correct and incorrect answers. Eventually they develop the understanding that they can take their own stances on issues based on their own personal experiences and beliefs (Perry, 1968).

On the other hand, multidimensional models determine one's epistemic position as a set of beliefs that differ across distinct dimensions or aspects of knowledge and truth (Greene Cartiff & Duke, 2018). A person's beliefs in one dimension can change independently of beliefs about the other dimensions (Greene Cartiff & Duke, 2018). Examples of such dimensions are: "simple and certain knowledge, justification by authority, and personal justification" (Greene Torney-Purta & Azevedo, 2010, p. 237). In a model like this, one might be classified as a dogmatist if he or she has a strong belief in "justification by authority" and weak beliefs in both "simple and certain knowledge" and "personal justification." Another would be considered a rationalist if he or she has a weak belief in "simple and certain knowledge" and moderate beliefs in both "justification by authority" and "personal justification" (Greene, Torney-Purta, & Azevedo, 2010, p. 238).

Furthermore, models can vary in the way that they address the problem of domain generality or domain specificity (Greene, Cartiff & Duke 2018). That is, some models propose that students may have different epistemic orientations towards different kinds of knowledge, or in different contexts (Greene, Cartiff & Duke 2018). For example, someone might believe strongly in justification by authority for the topic of history, while

believing strongly in justification through logic for the topic of science (Greene, Cartiff & Duke, 2018). Some models do not discuss this explicitly and are considered domain-general (Greene, Cartiff & Duke 2018). Greene, Azevedo and Torney-Purta (2008) argue that the evidence shows that epistemological thinking includes both domain-specific and domain-general factors. Indeed, both domain-specific and domain-general measures of epistemology have been linked to meaningful academic outcomes (Greene, Cartiff & Duke, 2018). Although theories of epistemological development differ in the above ways, they seem to follow a pattern of development from a more simple and black and white orientation towards knowledge (for example, the belief that knowledge comes from outside authority) to an understanding that assessing knowledge is a complex process (for example the knower plays a role in constructing the information from evidence while taking into account the context within which it was presented (Belenky et al., 1986).

This field offers an important contribution to my inquiry because individuals' epistemological beliefs may influence the ways in which they learn as they form the context in which they approach gaining knowledge in general. For example, a student who views knowledge as coming from external authority may believe that one learns best by ingesting (and regurgitating) knowledge that is dispensed from professors. On the other hand, those students who view knowledge as resulting from analyzing evidence from multiple sources of information could be likely to value discussion and debate. This very idea was advanced by Socrates who believed that students learn best when they actively generate self-knowledge, develop questions, and share and debate knowledge (Tweed & Lehman, 2002). Consequently, students' epistemological beliefs may

influence their attitudes toward education in general, and in particular, whether or not they value participating in class.

Additionally, like class participation, epistemological stance has also been linked to academic performance. Greene, Torney-Purta and Azevedo (2010) found that students in the later positions of the Epistemic and Ontological Cognitive Development Model (EOCD) typically had higher grades and more educational experience (Greene, Torney-Purta & Azevedo, 2010). Further support for these findings came out of research by Lee and Chan (2018) who found that students who held more advanced epistemological beliefs also tended to perform better academically (Lee & Chan, 2018). The relationship between epistemic beliefs and academic performance was not mediated by other variables in their analysis, such as the students' perception of their learning environment or study approaches (Lee & Chan, 2018). In 2018, Greene, Cartiff, and Duke conducted a meta-analytic review of 151 samples from research on epistemic cognition and academic achievement. They found an overall correlation of .162 ($d = .328$) between epistemological beliefs and academic achievement. In other words, if one accepts a stage theory model of epistemological development, then an advancement from the lowest or most naive stage to the highest or most complex stage may be associated with an increase of .328 standard deviations in academic achievement.

In short, both class participation and epistemological thinking have been linked to higher grades. These two constructs also seem to play important roles in the academic careers of young adults as they attend college, as they spend most of their time during these formative years in the classroom. How they choose to engage in class by participating (or not), and how they think about the knowledge they are receiving (and

those who are professing it), are worth exploring because they are key aspects of the college experiences for millions of people (D. Maynard, personal communication, May 5, 2020).

As of yet, there is little exploration in the literature of whether class participation and epistemological thinking are connected. However, Weaver and Qi's (2005) work exploring the relationship between views of professor as the authority of knowledge and class participation leaves open the possibility that how students think about knowledge and authority may influence their class participation habits. Therefore, it seems logical to include some questions about epistemological thinking in my exploratory inquiry into how students who seldomly, rarely, or never participate experience the classroom setting. How these students think about sources of knowledge may form the basis for the ways in which they approach learning in general. It is not a big stretch to propose that one's beliefs about knowledge might play a role in behavioral outcomes in the classroom, such as choosing whether or not to participate.

For the purpose of this study, I chose to focus on a unidimensional and domain general approach to epistemological development. A portion of my interview was inspired by the work of Belenky, Clinchy, Goldberger and Tarule, (1986). As a response to Perry's (1968) work which was only done on males, these researchers conducted 135 interviews with women from diverse educational and socioeconomic backgrounds. Belenky et al. (1986), postulated five categories of epistemological thinkers. These were silenced knowers, receive knowers, subjective knowers, procedural knowers (categorized as separate and connected) and constructed knowers (Belenky et al., 1986).

Silenced knowers feel voiceless and disconnected, blindly obey authorities, and do not have faith in their own ability to make decisions (Belenky et al., 1986). According to Belenky et al. (1986), *receive knowers* “learn by listening” (Belenky et al., 1986, p. 37); they believe that truth and knowledge comes from authorities, who have the correct answers (Belenky et al., 1986). *Subjective knowers*, on the other hand, think of truth as something that comes from intuition and see it as very private and personal (Belenky et al., 1986). To them, truth is subjective, and they may mistrust logical analysis. These knowers rely on “intuitive knowledge” (Belenky et al. 1986, p. 71), believing that the source of truth is inside. Unlike subjective knowers, *procedural knowers* do not believe that you can “just know” (Belenky et al., 1986, p. 94). They hold that “knowing requires careful observation and analysis” (Belenky et al., 1986, p. 94). This way of knowing is characterized by engagement in learning the tools, skills, and processes necessary for acquiring knowledge (Belenky et al., 1986). *Procedural knowers* can be further divided into two categories: *separate* and *connected knowers*. *Separate procedural knowers* might take a critical or adversarial viewpoint towards knowledge, seeking to be convinced, whereas *connected procedural knowers* try to empathize and deeply understand another’s ideas before they critically evaluate them (Belenky et al., 1986). Finally, *constructed knowers* understand that they are responsible for their assumptions and beliefs and continually reevaluate them. To them building knowledge is a constructive and complex process where the knower plays an active role (Belenky et al., 1986). Belenky et al. (1986) state that “the attention and respect that they might once have awarded to the expert is transformed. They appreciate expertise but back away

from designating anyone an ‘expert’ without qualifying themselves” (Belenky et al., 1986, p. 139).

I chose to explore the epistemological thinking of my participants using questions inspired by Belenky et al.’s (1986) framework because the Ways of Knowing Portion of their interview adapted very well to the context within which I aimed to pursue my inquiry. That is, it offered a unidimensional model of how people decide what they think is true, which is particularly relevant to the context of sitting in the classroom and silently listening to information. The questions used in Belenky et al.’s (1986) interview captured perfectly my research questions of how these silent students are evaluating the knowledge they take in and how they think about the source of authority that knowledge is coming from (i.e., the professors). One criticism of my choice may be the fact that Belenky et al. (1986) created their model using interviews with women only. My response to this is that the questions I used from their interview are non-gendered and applicable to anyone. Also, there is evidence that their model is applicable to all genders as a portion of their inquiry exploring separate and connected procedural knowers was adapted to a quantitative measure and studied using mixed gender samples (Marrs & Benton, 2009; Galotti, Drebus & Reimer, 2001).

Purpose of Study

This was an exploratory qualitative inquiry that aimed to understand how students who seldomly, rarely or never participate in the classroom think about class participation and experience the classroom setting. In order to understand the experiences of these students within a broader context, I wanted to learn a bit about who they were, how they felt about academics, their class participation habits (or lack thereof) and ask some

exploratory questions about their epistemological beliefs (Belenky, Clinchy, Goldberger, & Tarule, 1986).

The bulk of my inquiry focused on the central questions driving this project, which fell into three categories: class participation habits, epistemological development and connections between the two. My primary aim was to explore how these students thought about their class participation habits. Why did they think they did not participate? What aspects of their classroom environment or personal circumstances actually motivated them to participate? And how did they think not participating affected their classroom experience. A secondary aim was to get a sense of how these students were thinking about knowledge in the classroom. How did they discern whether information they were receiving was true? How did they determine whether their professors were experts or decide to trust what they were saying? And finally, I sought to understand whether there would be patterns between how students thought about knowledge and their views on their class participation habits.

Method

This study was HREB approved. I conducted an inductive inquiry that utilized a thematic analysis adapted from Grounded Theory (Braun & Clarke, 2006; Charmaz, 2008). Thematic analysis is a term generally ascribed to methods for “identifying, analyzing, and reporting patterns (themes) within data” (Braun & Clarke, 2006, p. 6). As my aims were to inductively look for themes and patterns in how students who seldomly or never speak in class described their classroom experiences and thought about knowledge, my project falls under this category. A grounded theory approach (Charmaz, 2008) is a systematic set of coding practices that are generally used to make meaning

from or generate a theory from a set of data. My aims were not to generate a theory in this project. However, aspects of the grounded theory coding process, such as open coding, axial coding, and memo writing (please refer to data analysis section for a description of how I engaged in these coding processes) were the right tools for my project as the themes and patterns in my data were emergent and no a priori hypotheses guided my analysis. As such, I wanted an approach that would enable me to analyze the data in a systematic way that allowed patterns to emerge without any pre-conceived codes. Grounded theory provided the appropriate framework.

Researcher's Background

I am a Psychology MA candidate at the State University of New York at New Paltz. Having been a Teaching Assistant for Undergraduate Psychological Statistics and Research Methods classes the past two years, I have had many students who seldomly or almost never participated in class. My curiosity about these students was heightened by the fact that, while there were some who did not pay attention and did not care about the courses, there were some who did care about the material and remained engaged in throughout the semester. When I attended university from 2007 to 2012, I found it incredibly difficult to speak up in my classes as well. Anecdotally, I've spoken to other graduate students who express having had the same difficulty in their college days. So, I came to this project with my own experience of feeling inhibited in the classroom and a view that it is a feeling that is widespread among students. I aimed to be as unbiased as possible in an open-ended exploration of the experiences that silent college students are having now. Through memo-ing and field notes I recorded my opinions and biases throughout the process of data collection and analysis and I took careful note of them

throughout my coding process in order to avoid projecting my own experiences onto my interpretation of the data.

Instrument

A semi-structured interview was created for this study which included questions addressing the following topics: Introduction and background information (e.g., “What year are you in school?”) , getting to know the student and his or her relationship to academics (e.g., “What do you spend the most time thinking about these days?”), experiences in class and class participation habits (e.g., “Why do you think you don’t participate or don’t like participating in class?”), and epistemological thinking (e.g., “How do you know something is right or true?”). Please see Appendix for full version of the interview.

Procedure

Participants were recruited via an email sent to Psychology undergraduates asking them to participate in the study for SONA credit. Participants were asked to sign up for the study directly on the New Paltz SONA systems website. Each participant met the interviewer in person in a quiet and private research lab on the SUNY New Paltz campus. The study started with a verbal informed consent process in which the participants were asked again if they met the criteria for the study and then the interview was described to them. After this, the participants were asked if they had any questions and whether they still wanted to participate in the study. After participants gave verbal consent, I started recording and interviewed them using the semi-structured interview described above. I asked additional clarifying questions where necessary. The interviews lasted between 20 minutes and 47 minutes. After the interviews were conducted, the recordings were

transcribed verbatim and promptly deleted. Participants were given pseudonyms and any identifying information, such as geographical places, or mentions of certain professors were changed in the interview transcripts to maintain anonymity.

Participants

Participants ($N = 14$) were psychology majors (or double majors) from SUNY New Paltz who reported that they seldomly, rarely, or never participated in class. Overall, 16 participants signed up to be interviewed for the study. Two participants were excluded from the study as they stated in their interviews that they participated often in some classes and they, therefore, were not part of my target population of silent students. All participants were proficient in English and over the age of 18.

Data Analysis

After the interviews were transcribed, I read each one a minimum of two times. I next selected the questions that offered information that were most relevant to my central research questions described above, leaving the questions that offered less relevant information out of my final analyses. From the questions that I chose to analyze, I first selected certain questions that could be coded in simple categorical ways. An example of this is the question: "Imagine that a professor has made a simple mathematical error in his or her calculations when explaining something on the board. What would you do? And why?" Participant responses were coded for either: a) they would correct the professor in front of the class, b) they would not correct the professor in front of the class and c) they might correct the professor depending on the circumstances.

The questions from the interview that elicited rich and pertinent information from participants were selected for an in-depth qualitative analysis and these were uploaded to

the Dedoose (www.dedoose.com), an online platform for analyzing qualitative and mixed methods data.

I began by engaging in line by line open coding, assigning meaning units to the data. This process involved creating a few words to summarize the main idea in each phrase of text stated in the interviews. After this, I read my open codes over and over, looking for duplicate phrases and merging the ones that conveyed the same ideas. After this, I started axial coding by looking for similarities between the open codes and grouped them together to create categories. For example an interview statement like “I feel kind of like, nervous” was assigned an open code of “fearful, anxious or nervous” while another interview statement of “like my heart goes and then, yea” was given an open code of “increased heartrate”. Later, these two open codes, along with many other similar ones were grouped together during the axial coding process to create the category “experiencing anxiety, nervousness, or related unpleasant physical symptoms.”

Once I had my initial set of categories, I used a selective coding process to draw connections between them to create themes. Throughout this process I wrote memos and field notes recording the process of my thinking and how I saw the meaning developing from the chunks of data. The field note and memo writing process allowed me to record my interpretations of the data as I was working with it in real time, and some of those ideas were pertinent to my coding scheme. For example, after I interviewed participants, I would often write down my thoughts and note whether I had noticed participants mentioning similar ideas. I referenced these notes during my coding process, and occasionally, they proved helpful in defining my categories and themes.

Once my codebook was complete, and I felt that the themes and categories (or axial codes) I had created thoroughly captured the meaning of the data, I sought assistance from an outside coder and inter-rater reliability was calculated. The coder was given 3 interviews, which were randomly selected to represent 20% of my data, and a codebook with my themes, axial codes, and their definitions. The coder started line by line coding and asked a few clarifying questions about my coding scheme after which, he continued to code the 20% sample independently. After this, we met and compared our codes. Incorrect and missed codes were discussed to make sure there were not discrepancies or oversights in my coding scheme. A tally of correct, incorrect (6.7%), and missed (9.3%) codes was calculated for a total of 84% code agreement.

Results

Getting to know participants

All my participants stated that they seldomly, rarely or never participated in their classes. Thirteen participants were female and 1 was male. All participants requested to be addressed with gender normative pronouns. Although all participants identified as rarely or never participating in class, only 2 of them reported disliking or being uncomfortable participating in small groups. See Table 1 for their self-reported amount of participation.

Table 1

Participants and self-reported class participation

Participant	How often Participates	Ways Participates
Angela Senior Age 30	“Twice a semester per class”	“I’ll answer a question. I don’t ask a question”
Barb Junior Age 22	“Rarely. If I participate in class, I’m probably reading something off of a handed-	Reading off hand-outs. Short answers. Offering something experienced outside classroom

	out sheet of paper.”	or learned previously.
Carl Sophomore Age 19	Not often. Maybe 20 times a semester or less.	Asking questions. Short answers.
Diane Junior Age 29	“Not at all if I can get away with it.”	Group work. Once in a while will raise hand if knowledgeable or confident, or has a better explanation than professor
Ellie Senior Age 21	Never	If a teacher asks something related to life. When it's opinion based and can't be wrong. Or if teacher makes atmosphere comfortable and open
Finlay Freshman Age 18	Once every 2 or 3 weeks	"Sometimes if I'm like 110% confident on my answer, then I'll raise my hand" Would never shout out answers.
Gabby Junior Age 19	Can probably count the times. Not very much. Maybe 10 times a semester.	Raising hand. Going to office hours. Talking to peers
Hannah Senior Age 21	Maybe once per class week	Group work. Answering questions if comfortable with teacher. Sometimes asking questions after class.
Isabelle Sophomore Age 19	Very rarely. Close to never.	Non-verbal participation such as Facial expressions. Ex: eye roles, eye contact, nodding, smiling. Might talk to peers.
Kelly Junior Age 20	Once a week in all classes all together.	Raising a hand for a class poll. Talking to classmates during group work.
Layla Junior 20	Maybe once every 3 or 4 classes	Asking questions. Giving personal examples.
Madeline Freshman Age 18	Barely participate. Only when called on.	Answering questions. Gives opinion.
Nadia Senior Age 22	“When I absolutely have to. when the teacher calls on me.”	Answering when called on. Asking questions after class.
Olivia Sophomore 19	“I can count on my hands how many times I have this semester. And it's very rarely, like, me willing to do it.”	Answering questions. Giving example when answer is known.

Note. Included answers are this author's summaries of the participants statements unless excerpt is in quotations.

Although each participant had his or her own definition of what it meant to seldomly, rarely or never participate in class, all of them participated less than once per class period. Seven participants referenced giving answers to questions. Three participants mentioned group work. Two participants said they would ask questions in class and 2 participants reported only asking questions after class.

Class Participation

When participants were asked why they did not participate, what actually fueled them to participate, and how they felt while participating in class, several themes emerged from their answers.

To Avoid Being wrong

A primary theme that emerged in the data was wanting to avoid being wrong, which was mentioned by 11 participants in total. Eight participants referenced generally wanting to avoid being wrong (often to avoid the fear or embarrassment of being wrong) as a primary motivation for not participating. Nine participants also spoke of two kinds of consequences of being wrong.

Self-judgment if wrong

Three participants said that being wrong would often lead them to self-judgement. Examples included references to lowered self-esteem and feeling less intelligent than others, like Gabby who, when responding to the question: “what happens in your mind if you get it wrong?” who stated, “I feel like my self-esteem kinda goes down in a sense. Like I’m just like oh wow, that was an obvious one that I could have gotten right but everyone else got right and I didn’t. you know, and it’s like, oh well. Oops! It kinda just

seems like I'm like, on the dumber side than everyone else is." These sentiments were echoed by Madeline who said, "in my head I judge myself like really bad."

Speculated judgments of others if wrong

Another consequence of being wrong cited by seven participants was the speculation about how others in the classroom, such as their professors and peers, might judge or perceive them. An example of this came from Olivia's interview in which she said, "it's just like, you think if you do something wrong, people are going to look at you differently because you weren't able to grasp a certain concept or something. Not just the professor but like, fellow classmates." Angela also speculated about specific possible judgements her professor and peers might make. She said, "you're wrong and everyone knows it. They're like you don't know. It's like you don't know the material and the teacher's like oh you weren't studying. Like, that's not the right answer. That's what goes through my head."

Actual consequences not as bad as perceived

It is interesting to note that although participants often referenced elaborate storylines about the consequences of being wrong, when asked if this actually happened to them, five participants articulated that the consequences were not as bad as they thought they would be. When some participants were asked what happened when they were wrong, they found this rather humorous, like Finlay, who said laughing, "literally nothing hahaha nothing happens..."

Not Participating

Most of the other reasons offered for not participating were organized into two general themes. One was external context which included aspects of the classroom

environment, situational circumstances, or behavior of others. The second was internal context which included aspects of subjective personal experience or personal preferences and tendencies. See Table 2.

Table 2
Reasons for not participating

<i>Themes Categories and # of Participants</i>	<i>Example quotes</i>
<i>External Context</i>	
Not responsible for participating (3) (references to not seeing a need or opportunity to participate in class. References to thinking peers will participate instead)	“I really don’t see the need to.” – Carl “Sometimes I feel like, there’s like, not an opportunity to participate. Like a lot of my classes are lectures.” – Kelly “I just don’t feel a need for me to do that. I’m sure there’s other people who have got it under control. That know what they’re talking about for sure.” – Nadia
Not wanting to talk in front of others (5) (references to presence of others deterring one from speaking, feeling watched or in the spotlight.)	“I think it’s like a social thing. I don’t like having, like, other people looking at me and hearing my answer.” - Hannah
Avoiding or fearing continued participation (3) (references to not liking when a professor continues to engage after participating, or being caught needing to answer more questions)	“I hate it when the teachers ask a question and you answer it and then they follow up with another question and it’s like oh my god I don’t know!” - Ellie
<i>Internal Context</i>	
Preferences for sitting and listening (3) (references to preferring to sit and listening or wanting to hear the right answer)	“I’d rather just observe and like be able to pay attention and take the notes that I want rather than like focusing on if I’m going to have to say something or like if I’m going to be asked a question.” – Nadia
Reliance on solitary self-engagement (4) (references to looking for answers or engaging with material on one’s own. References to keeping to oneself or not knowing others in class. Not needing to share own answers with others)	“If I do a reading, like I’ll discuss it on my own. Like, I’ll have my own thoughts about it.” – Madeline “If the teacher asks a question to the class, and I know it, I already know that I know it. Nobody else needs to know that I know it.” – Carl “I just kind of keep to myself for that.” - Diane
Experiencing anxiety, nervousness or related unpleasant physical symptoms (11)	“I feel kind of like, nervous.” – Hannah “Nervous, like really just like anxiety” –

(references to participating inducing anxiety fear or nervousness. References to physical symptoms such as sweating, hands shaking, or turning red etc.)	Isabelle “My heart rate goes up, I feel like my face turns red... all of a sudden I feel like I’m dripping sweat.” - Angela
Personal Monitoring (4) (references to analyzing one’s speech habits or behavior in front of the class. References to having standards for one’s comments such as wanting them to be unique or of high quality)	“My thoughts will get like messed up. And then like I might stutter or mess up what I am going to say.” – Finlay “I want it to be of the best quality and relevance to the conversation, instead of something that just mildly sounds like what everyone else is talking about so I spew it out.” – Layla
Missed opportunities while overthinking (2) (references to missed opportunities to participate in class because of hesitating or overthinking)	“I’ll just like want to sit there and like thoroughly make sure that I can say what I’m about to say. And then by the time I’m like done thinking about it, it’s like, it’s gone, the opportunity is gone.” – Isabelle
Lack of understanding of the material (2) (references to not understanding what is happening in class)	“You just either don’t understand it enough to ask a question, or, like, I dunno.” - Kelly
<i>Miscellaneous</i> Other (3) (general references to disliking participating in class. Miscellaneous situational preferences that did not have enough references to be considered categories)	“I hate it.” – Finlay “I don’t like that feeling.” – Angela “I don’t want to waste the teacher’s time” – Ellie “I’m definitely not an in-class question asker.” - Kelly

Participating

When asked what kinds of things actually influenced them to participate, participants cited engaging in two kinds of participation. One I titled low stakes participation, because it involved circumstances which presented minimal risk of being wrong. Some students engaged in low stakes participation when they felt prepared to answer correctly. Responses that fell under this theme included references to subthemes (or categories), such as having or building confidence, deliberating or rehearsing answers, and knowing the answer or being sure they were right. Some students engaged in

participation that was low stakes because it required little thought such as spontaneous or spur of the moment comments or reading off of text in class. Finally, other motivating circumstances were referenced, which I chose to call regular stakes participation, because these did not necessarily involve minimizing the risk of being wrong, such as feeling comfortable in the classroom (environmental context), and being interested, passionate or excited about the topic. See Table 3.

Table 3
Reasons for participating

<i>Themes and Categories</i>	<i>Example quote</i>
<i>Low Stakes – Participating when one is ‘correct’</i>	
Having or building confidence (7) (references to building up confidence to answer or being confident in the subject or what one is saying)	“With subjects I’m more confident with, I’ll speak more.” – Barb “I do like to be very confident before I speak. I wanna make sure that either I’m confident in the question I’m asking, or in the answer I’m giving.” – Diane
Deliberating or rehearsing comments in one’s head (3) (references to deciding whether to participate in one’s head. References to practicing one’s comment internally before one says it)	“If we’re going along in a lecture and I have a sudden question, I might even just wait a few minutes before I ask so I can make sure the question makes sense, make sure I can’t answer it on my own first.” – Carl “Like I repeat what I’m going to say in my head like five times before I say it. Haha like ok I have this down and I know what I’m going to say.” – Nadia
Knowing the answer or material (11) (references to only participating when one knows the material or is sure they are right or know the right answer)	“Usually I have to know that what I’m about to say is correct.” – Carl “I think it’s just like when I <i>know</i> the answer” - Angela
<i>Low Stakes– Participation requiring little thought</i>	
Engaging in low risk participation (3) (references to reading off text or giving very short answers)	“I usually try to at least participate by reading things off of the textbook or the paper we’ve been handed out just so I can claim I’ve participated even if it’s in a very small way.” – Barb
Spontaneous participation (3)	“It’s very spur of the moment.” – Barb

(references to not thinking before speaking or participating spontaneously)	“I don’t always think before I speak.” - Diane
<i>Regular stakes - Motivating Circumstances</i>	
Environmental context (5) (references to being comfortable in the classroom or participating due to professors’ or peers’ demeanor or behavior)	“It’s kind of like, when a professor asks something and I sort of know the answer and it’s like dead silence and I feel like a little bad for them, I’ll like maybe raise my hand if I’m feeling it.” – Olivia
Being interested, passionate or excited about the topic (4) (references to relating to topic, interest, passionate, excited, or when topic is personal etc.)	“Especially if it’s a topic I’m interested in, if it’s something I’m passionate about, then I’ll participate.” - Hannah

It is interesting to note that every single participant mentioned engaging in some kind of low stakes participation but only 4 stated that they were motivated to speak up when interested or passionate about the topic. It seems that the majority of these students thought there might be a lot at stake when speaking up in class. Indeed, 11 participants recounted that, when they participated, they felt anxiety, fear, nervousness or other related physical symptoms as if they were deeply scared of something. But what consequences were they worried about? One assumption that might be made is that these students did not participate out of a straightforward fear of speaking in a group, but it seems that the answer might not be so simple. Although this theme did come up in their interviews, only five participants referenced simply not wanting to talk in front of others. And out of a total of 12 participants who were asked how they felt about public speaking, only 6 participants said they disliked or hated it. Two participants said how they felt depended on things like their own preparation and comfortability with the topic or the classroom atmosphere. Two participants reported that they had taken public speaking classes, which had helped them feel more comfortable or less nervous doing it. And two participants reported loving it or feeling very comfortable with it. The fact that all

participants seldomly, rarely, or never participated in class but had mixed opinions about public speaking suggests that assuming students do not participate because of shyness or fear of speaking in front of others oversimplifies the answer. While this may be the case for some students, overall, there is a deeper motivation for classroom silence at stake. Why might public speaking be different? One is prepared for what one is about to say. One *knows* the answers.

This idea is consistent with the primary theme of wanting to avoid being wrong that emerged in the data. A majority of participants (11) discussed wanting to avoid being wrong and speculated about the negative consequences of it happening. Nine of the 11 participants who spoke about being anxious or fearful also mentioned this theme of being wrong. When participants engaged in low stakes participation, they were less at risk of being wrong in the classroom. Indeed, the overwhelming majority (11) of my participants reported participating when they knew the answer or material, in other words, they were fairly certain they were not going to be wrong.

Called on or forced participation

Unsurprisingly, when asked how they felt about being called on or forced to participate most participants stated that they hated or did not like it. They spoke of similar reactions to those they had about general participation such as feeling embarrassed, or feeling negative emotions such as anxiety, fear or anger, or physical symptoms such as shaking, turning red or sweating. Some unique challenges of forced participation were discussed. One was being unable to answer in a satisfactory way. Students spoke about forcing answers, stumbling over words, or saying something mistaken or wrong despite knowing the answer. Some participants recounted being

called on when the answer was unknown and how they handled the situation. A few participants referenced feeling worse when failing to answer because others assumed they had not been listening. Inevitably, there were some references to being caught off guard zoning out, or not listening. A final category that emerged in their answers was references to lacking time. Sometimes lack of time was positive as in, they lacked the time to build up anxiety, or second guess themselves. Other times, they lacked time to think or build courage to speak.

Syllabus requires participation

When asked how they felt when the syllabus required class participation 7 participants stated that they disliked or hated the requirement. Two participants stated that they had no opinion or liked it. Three participants stated that in some cases they understood why the requirement was necessary or useful. And two participants said that they thought requiring participation on the syllabus was unfair. There were a number of responses which were oriented around the theme of not fulfilling the participation requirement. Some participants stated that the requirement was difficult and referenced barriers to fulfilling it, like Ellie, who said, “how am I ever going to get this percentage because they don’t make it easy to participate.” Others mentioned that they would not participate despite the grading incentive. Isabelle said, “I’ll have an incentive like for my grade I have to participate in the class, but I still won’t do it.” Finally, a few participants also spoke about creating strategies to make up their grade in other ways, like Finlay who said, “I’ll know that if I don’t participate, then I’ll have to study more to do better on tests, quizzes, and essays to make up for the lost participation grade.”

Participants who mentioned the theme of fulfilling the participation requirement articulated easy ways to do so such as, references to professors being generous or counting attendance. For example, “it will be like attendance and participation. So, if you show up and you raise your hand once a week, I think that pretty much constitutes an A” (Kelly). They also offered that they felt more pressure to participate. Finally, they also referenced creating strategies to increase their own participation in class such as when Gabby said, “I try to like push myself a little bit more to participate and raise my hands, ask questions, and stuff like that”. Madeline also added, “like for example, in one of my classes, they require participation, so I always like try to at least say something so it counts for the day. So, it doesn’t really affect my grade.”

Listening to peer participation

Participants were also questioned about their experiences while listening to their peers speak in class. While some students stated that it depended on what they were saying but they didn’t mind it or think too much about it, others recounted having stronger opinions. Students who spoke positively of listening to their peers in the classroom often stated that they preferred their peers to talk rather than themselves. They made references to relief, not having to be the one to ask, or feeling happy for peers who participate. Another category that emerged in their answers was that listening to their peers enhanced their learning, which included references to peers’ comments as being interesting, useful, or offering new ways of thinking, and liking peers’ comments. Diane articulated this category very well when she said, “maybe another classmate might have a really good question and I stop to think going, I would have never thought of that.”

A few participants offered negative experiences or opinions about aspects of peer participation. They made references to hating certain types of comments, feeling frustration, or not finding value in peers' words. For example: "I hate when people say something that's like really obvious" (Isabelle). Additionally, many participants spoke of making negative comparisons with their peers. In other words, they referenced wishing they could participate as well as their peers, or feeling less capable or jealous. Madeline articulated this well when she said, "I just feel like kind of bad about myself because I like don't have the courage enough to participate like they are doing. 'Cause they're like more talkative than I am."

Does participating (or not) affect classroom experience?

Participants were asked whether they thought participating affected their experiences in the classroom. Six participants felt that participating had or would have a positive effect on their classroom experience. Their answers fell into two general categories. The first was that participating enhanced their learning in general, which included references to the idea that participating pushes oneself to be more focused, or references to feeling like they were not learning as much when not participating. Some examples include, "there are times I wish I did participate just so I could have that extra ability to learn" (Barb). And, when Gabby said, "I notice when I raise my hand and ask questions, the professor kind of like directly looks at me. So, it's like, you're kinda like, a little more pushed to focus on the exact, like, 'cause he's answering the question I'm asking. So, it's like you're trying to comprehend what he is saying. So, it pushes you to understand it better and grasp the concepts better." The second category revolved around the idea that not participating meant that questions would go unanswered. This included

references to having unanswered questions or missing out on opportunities to learn from questions. Diane stated, “I think by not participating and just sitting back, there might be a question that goes unsaid that everyone wants to ask but no one wants to ask it.”

Another six participants stated that participating or not participating had no effect on their classroom experience. Their answers included learning the same amount or doing just as well academically. As Carl articulated, “I think I would say no actually because on days where I might answer a quick question or ask one of my own, I still learn the same way as I would on a day where I remain completely silent.” Another category that emerged in their answers was learning from others’ comments. Finlay stated, “no because if I’m not the one participating, then other students will and then, like, I can learn from their answers and responses.”

Finally, two participants recounted that participating distracted them from what they were learning in the classroom. Their accounts involved being distracted by the behavior of others, like when Ellie said, “distracted by everyone dead staring at you, and the teacher staring at you.” In addition, Angela mentioned being distracted by one’s anxiety or physical symptoms and trying to calm down. She said, “it distracts me from like whatever the teacher says after ‘cause I’m like sitting there and trying to like calm myself down. So, I’m focused on trying to breathe and just like relax.” She also recounted being distracted by her own internal monologue. “If I get the answer wrong like I don’t even know what would happen after that. It’d be a whole ‘nother, it’d be like a 15 minute ordeal trying to like talk to myself like ‘this is why we don’t participate in class, this is why we just sit here...’ [pause] And then I’m like why am I talking to myself in the middle of class? I should be focusing! Now I gotta go and print out the

PowerPoint because I don't have this slide and I'm like oh my god this is terrible, I should just go home. Very nice internal monologue I have with myself" (Angela).

It was interesting to note that all three of the students who cited the idea of not feeling responsible for participating as a reason not to participate, also felt that participating had no effect on their in-class experience. Yet three out of the 4 participants who engaged in regular stakes participating when being interested, passionate, or excited about the topic also felt that participating in class had no effect on their experience.

Correcting others in front of the classroom

Participants were presented with two scenarios similar to the story that sparked the idea for this project. They were asked, "Imagine that a professor has made a simple mathematical error in his or her calculations when explaining something on the board. What would you do? And why?" And then they were asked, "And would you feel the same way if it was another student?" I coded their answers for three behaviors: They would correct the professor or student in front of the class. Maybe, they might correct the professor or student in front of the class depending on the circumstances. Or, they would definitely not correct the professor or student in front of the class. See Table 4 for their answers and summaries of their reasons for choosing them.

Table 4

Would you correct a professor or student in front of the class?

Participant and Answers	Correct Professor in class?	Correct Student in class?
Angela Correct Professor: No Correct Student: Yes	"I would wait till after class to say something" attention on me. Don't like calling people out.	"I feel like it's easier to tell a fellow student that they're wrong 'cause then you can kind of like go back and forth and like figure out the right answer."
Barb Correct Professor:	Happened before. I waited until	"I kind of expect the teacher to

Maybe Correct Student: No	after class to approach professor. "If I was really confident about it, I might say something in class."	say something." Less tempted to say something than if professor's mistake.
Carl Correct Professor: No Correct Student: No	Somebody else will point it out.	That's the professor's job. Even more inappropriate to say something.
Diane Correct Professor: Maybe Correct Student: Maybe	I would probably wait until end of class. Unless it's really significant and relates to what we're learning. Not confident. Professor might take it the wrong way.	I would ask how or why things changed and if they realized it. Would also double check with professor after class. Person might be shy like I am. Wouldn't want to be corrected in front of others.
Ellie Correct Professor: Maybe Correct Student: Yes	If I understand problem, will do it on own paper. If I don't understand how they got it, I will raise my hand and ask.	"More easy to speak to someone like around your age than it is to someone that's more authority to you and who always thinks they should be right and stuff like that."
Finlay Correct Professor: No Correct Student: No	I would talk to the person next to me. They would raise their hand so I wouldn't have to. Professor is supposed to be smart. Might feel weird about me if I correct them.	I might say something once they sat down. Not in front of everyone. Don't want the rest of the class thinking that student is dumb.
Gabby Correct Professor: Yes Correct Student: Yes	I would raise my hand and tell him because it's something I know for sure.	"It would actually be easier cause it's like - it's your peers, it's your similar age group."
Hannah Correct Professor: Maybe Correct Student: Yes	Depends on how big the error is. Ask a peer first if it's wrong. Then I might say something if feeling comfortable and know the professor well. If not will ask the peer to tell them.	"I'd be more comfortable telling the student. I think, especially I have experience in like tutoring, so I am used to like telling people, like students, hey this is not right let's fix it a little bit."
Isabelle Correct Professor: No Correct Student: No	I will wait for somebody else to say something. Don't really care whether the particular question was done correctly.	Less likely to tell them because I would care even less. Lower expectation for them to do it right.
Kelly Correct Professor: Yes	"I would probably just raise my	"Yes."

Correct Student: Yes	hand and be like I think a couple steps back you wrote a 3 instead of a 1 or something.”	[No explanation offered]
Layla Correct Professor: No Correct Student: Maybe	"I'm not usually one to correct the professor on a mistake specifically, so I'd probably just assume that at least one person in the class is comfortable doing that." They are authority, in charge. Don't want to interrupt flow of teaching.	I might correct another student. "I could assume maybe they were just more nervous to be in front of the class, like I'd feel for them a little more than I'd feel for the professor."
Madeline Correct Professor: No Correct Student: No	"I would stay quiet and wait until somebody else points it out." Feel bad pointing out someone else's mistakes.	Would feel the same way.
Nadia Correct Professor: No Correct Student: No	I would ignore it and write it in my notes. Also write what I think the correct answer is. I would ask a different professor after class. Don't like telling people they made a mistake.	"I would super never correct a student doing it on the board". Would just feel awkward. "That's like the teacher's job anyway."
Olivia Correct Professor: No Correct Student: No	In an ideal world I would point it out. [i: In the real world?] - "I would wait for someone else to point it out" "I don't like to participate so I know someone else would pick it up."	"I would feel even less comfortable like telling them that they're wrong because they don't know the information yet fully, as much as the professor is supposed to."

Note: Blurbs are author's summaries of participants' statements unless in quotations.

Out of the 14 participants, only 2 stated that they would correct the professor's mistake in front of the class. Four stated that they might say something depending on the circumstances and 8 admitted that they would definitely not correct the professor. By contrast, 5 students said that they would correct another student, 2 answered maybe, and 7 stated that they would not say anything in front of the class. Although the number of participants who would not point out mistakes to professors and students differed, it

seems there was a general reluctance to tell someone that they were wrong in front of others. Some participants articulated that they expected that someone else would point out the mistake and others said they would feel more comfortable saying something after class, in private.

Epistemological thinking

As stated above, two of the major themes that emerged were fear or avoidance of being wrong and only participating when prepared to answer correctly. These themes suggest that the idea of ascertaining truth is salient to these students. They also professed some interesting ideas about knowledge when questioned about their epistemological thinking.

How do you know something is true?

Participants were asked “how do you know something is right or true?” Their answers reflected several ways of thinking about sources of knowledge. Some participants initially interpreted the question to be about what was morally right or true. In these cases, I clarified the question for them and their responses about morality were not coded as they were not applicable to my inquiry. See Table 5 for categories and definitions and examples.

Table 5

Participants’ beliefs about knowledge

Belief	Definition	Example quote
Knowledge comes from external authority (5)	References to believing the professor, the textbook or what is said in class. Assuming the school curriculum is true.	“Well you kind of always believe that the professor is telling the truth. ’Cause he’s getting paid to give you that kind of knowledge. So you, kind of, always blindly believe him” - Gabby
Knowledge comes from	References to distinguishing	“It has to come from a

credible sources or trusted people (6)	between kinds of sources. Sources must have credibility (criteria for credibility can vary). Trusted people might have first-hand experience or confidence.	credible source. Someone who has experience in the field.” - Barb
Knowledge comes from internal subjective decision (6)	References to deciding what is true based on personal experiences, gut instinct, or a personal decision-making process. How something sounds to the participant.	“I think you base it on your own experiences and like, what you witnessed.” – Isabelle “If you believe something is true as like a gut instinct, ’cause I’m a big person on gut instincts, and um, so if you think it’s true in that sense, you gotta stick with it.” - Olivia
Knowledge comes from scientific research, evidence, replication and consistency (9)	References to how something is researched, citing specific criteria for reliability and validity. References to facts, replication, and seeing the same findings in multiple sources as evidence.	“I would actually need. Like let’s say I would have to read the article that says that, like word for word. And like the – that has the actual research behind it.” – Madeline “It’s just like being able to find the same thing in multiple sources.” – Angela
Knowledge is contextual and complex (1)	References to truth depending on many factors including context. Acknowledging that even sources of authority can be subjective.	“Psychology subjects can be very subjective. So even something that’s in the textbook is something that different people have different viewpoints on. So, um, this is a tough one.” - Layla

Unlike Belenky et al.’s (1986) framework where participants were categorized as generally having one orientation towards knowledge, the participants in my sample often cited multiple possible sources of knowledge in their answers. For instance, Gabby articulated the belief that knowledge comes from external authority but also that it could come from an internal decision-making process. Only 1 participant’s answers were categorized as knowledge is contextual and complex. Among the quiet students in my

sample, this belief is an outlier but merited including because it was indicative of the beliefs of the constructed knower in Belenky et al.'s. (1986) model. See the following table for participants and themes present.

Table 6

Participants and their cited sources of knowledge

Participant	External Authority	Trusted sources or people	Internal decision	Science and Replication
Angela		X		X
Barb		X		X
Carl		X	X	
Diane				X
Ellie	X	X		X
Finlay	X			X
Gabby	X		X	
Hannah		X	X	X
Isabelle			X	
Kelly				X
*Layla		X	X	
Madeline				X
Nadia	X			
Olivia	X		X	

* Layla is the only participant who also mentioned the theme that knowledge is contextual and complex. The category is not included in this table.

Participant's views on expertise

Participants were asked whether they thought they could rely on experts to learn about something they really wanted to know. Ten participants said they could rely on experts and three participants said that they might be able to rely on experts but not always. And one participant stated that she did not think she could rely on experts. They were also asked how they knew whether their professors were experts and how they

decided whether to trust what they say in class. See Table 7 for a list of themes in their responses.

Table 7

Participants' criteria for trusting what a professor is saying

Criteria	Definition	Example quote
Education level or investment (9)	References to PhD credentials or the time and money spent on education.	"I think it's just like the whole PhD at the end of the name because it shows the dedication and like the time spent." – Angela
Time and experience in the field (4)	References to experience and time spent researching and teaching the subject. References to contributions to the field, such as publications.	"They've taught the same thing for several years, maybe decades... if they were teaching something wrong that whole time and nobody pointed it out, that would be really bad!" – Carl
Expertise is communicated or evident (5)	References to professors communicating their expertise directly by stating their experience with the topic. Or they will communicate indirectly by their ease and comfort in discussing the topic, or passion and excitement for the topic.	"A lot of professors like to talk about what their majors are, where their fields are, what it is that they can tell you what their knowledge is based off." – Diane "If they're like super excited and like, into what they're teaching, and you know they have a true passion for the subject. So then I feel like you can trust them." – Finlay
Comparing professor's claims with other sources (5)	References to comparing professor's claims with other sources such as the textbook or published research. References to determining whether their opinion matches consensus of other experts in their field.	"If there is evidence to back up what they are teaching, like in the textbook or something, then that is for sure." – Ellie "It depends on how different their opinion is to the general populace of other people with, let's say, doctorates." – Barb
Assumed expertise (3)	References to assuming professors are experts because of their position and title.	"Hopefully they do because it's their job!" – Kelly "They're a professor for a reason." – Finlay

The categories above are not mutually exclusive. Participants often cited more than one way of determining whether to trust what the professor was saying. See Table 8 for a breakdown of which participants cited which theme.

Table 8

Participants and their cited criteria for trusting what a professor is saying

Participant	Education level or investment	Time and experience in the field	Professors communicate expertise	Compare with other sources	Assumed expertise
Angela	X			X	
Barb	X	X		X	
Carl	X	X			
Diane			X		
Ellie				X	
Finlay	X		X		X
Gabby				X	
Hannah	X	X			
Isabelle	X	X	X		
*Kelly				X	X
Layla			X		
Madeline	X				
Nadia	X				
Olivia	X		X		X

**Note.* Kelly is double coded here in two categories that may seem mutually exclusive.

The participant, Kelly, is included in both assumed expertise and comparing professor’s claims with other sources because she said “hopefully they do because it’s their job. Like and they’re not teaching you the wrong thing! Haha, but um, I guess I just trust them. I guess I just, yea I never thought of that. I just trust them. And then I, unless there’s something that I’m really not understanding and I’ve looked into it, and I think

that however I answered or whatever is right, then I'll kind of be like I think maybe you're not right. And then just talk to them about it."

Interestingly, two of the three students who cited assumed expertise (other than Kelly) also mentioned the theme of external authority as a source for knowledge.

Connections between epistemological development and class participation habits.

As an exploratory inquiry, I sought to find out whether there were any patterns between students' epistemological thinking and their class participation habits. I focused on the two main epistemological questions in my interview: "how do you know something is right or true?" and "How do you know a professor is an expert? In other words, how do you decide whether to trust what a professor is saying?" I wanted to know how many participants who cited each epistemological category also referenced certain class participation themes. I went back through my data and reviewed the epistemological categories to see which participants cited each one. I then did the same process for the relevant class participation themes. After this, I systematically searched for overlap between participant references to each epistemological theme and each class participation theme. For example, how many of the 5 students who cited external authority as a source for knowledge also cited the theme of avoiding being wrong?

Sources of knowledge and class participation

I compared cited sources of knowledge with mentions of the themes of regular stakes participation, to avoid being wrong, and experiencing anxiety or related physical symptoms when participating. See Table 9 for the number and percentage of participants who mentioned each category of source for knowledge and participation theme.

Table 9

Connections between sources of knowledge and class participation

Class participation themes and % of those who mentioned each knowledge source	Regular stakes – environmental context		Regular stakes – interest, passion or excitement		To avoid being wrong		Experiencing anxiety or related symptoms	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Sources of knowledge								
Knowledge comes from external authority (5)	2	40	0	0	5	100	5	100
Knowledge comes from credible sources or trusted people (6)	3	50	3	50	5	83	4	67
Knowledge comes from internal subjective decision (6)	3	50	3	50	5	83	4	67
Knowledge comes from scientific research, evidence, replication and consistency (9)	3	33	3	33	7	78	7	78
Knowledge is contextual and complex (1)	0	0	1	100	1	100	0	0

Note. Knowledge is contextual and complex is included here even though only one participant mentioned the theme.

There were no major patterns that emerged in this inquiry. It was interesting to note, however, that fewer of the students who believed in external authority as a source for knowledge reported engaging in regular stakes participation than those students who referenced other sources of knowledge. And none of the students who cited authority as a source for knowledge reported participating because of interest, passion or excitement for the topic, whereas at least 3 mentioned this theme from every other category (except knowledge is contextual and complex, which only one participant cited).

Criteria for expertise and class participation

I also compared how many of the students who mentioned each criterion for expertise also referenced regular stakes participation, to avoid being wrong, and

definitely *not* correcting a professor in front of the class. See Table 10 for number and percentage of participants who mentioned each criterion for expertise and the participation themes.

Table 10

Connections between criteria for expertise and class participation

Class participation themes and % of those who mentioned each criteria for expertise	Regular stakes – environmental context		Regular stakes – interest, passion or excitement		To avoid being wrong		Would <i>not</i> correct professor in front of class	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Criteria for expertise								
Education level or investment (9)	4	44	1	11	7	78	7	78
Time and experience in the field (4)	1	25	2	50	2	50	3	75
Professors communicate expertise directly or indirectly (5)	2	40	2	40	4	80	4	80
Compare professor’s claims with other sources (5)	2	40	0	0	3	60	1	20
Assumed expertise (3)	1	33	0	0	2	67	2	67

Note. There is one participant who cited assumed expertise and said she would correct the professor in front of the class. This participant also referenced comparing professor’s claims with other sources in her interview. Her answers make a little more sense in this context.

Once again, my inquiry into the connection between mentions of criteria for expertise and references to class participation themes did not prove fruitful. There was, however, one interesting pattern in that only one participant who referenced comparing professors’ claims with other sources was unwilling to correct a professor’s simple mistake in front of the class, which was less than any of the other criteria for expertise categories. This is not surprising given that a student who believes in the fallibility of

professors and the utility of cross referencing their information would likely be more willing to point out an error than a student who does not question the expertise of his or her professors.

It is also interesting to note that both the students who said they would compare professor's claims with other sources and the students who spoke about assumed expertise did not mention participating out of interest, passion, or excitement for the topic.

Discussion

This study was an investigation of the classroom experiences of students who seldomly, rarely, or never participate in class. I attempted to get a sense of how these students thought about why they did not participate, what actually prompted them to participate, and how they felt about participating in class. In addition, the study sought to understand how these participants were thinking about knowledge and how they decided to trust the expertise of their professors. Finally, an exploratory portion of the study was dedicated to finding out whether there were any connections between how students thought about knowledge and expertise and their class participation habits.

Class participation

When asked why they did not participate, participants brought up the several themes. A major theme was wanting to avoid being wrong. The majority of participants in my sample speculated about consequences of being wrong, which included self-judgment and judgment of their peers and teachers. To avoid being wrong and experiencing anxiety nervousness or related physical symptoms seemed to be the primary motivations for not participating in class as they were both cited by 11 of the 14 students

in my sample, over twice as many times as any other reason for not participating. It seemed as if the two went hand in hand, as students often articulated the looming nervousness or fear of anticipated consequences of being wrong when they spoke up in class. Although not present in previous literature, the desire to avoid being wrong was so prevalent among my sample that it merits attention and further investigation.

Participants also discussed reasons for not participating that were part of their external context, such as, not feeling responsible for participating, not wanting to talk in front of others, and avoiding or fearing continued participation. They also cited other ideas that were part of their internal context, such as preferences for sitting and listening, reliance on solitary self-engagement, personal monitoring, missed opportunities while overthinking, and lack of understanding of the material. Some of these themes aligned well with past literature on class participation. Lack of understanding of the material is consistent with Karp and Yoels's (1976) finding of not having enough knowledge of the topic under discussion as a self-reported reason for non-participation. Similarly, the speculated consequence of being judged by peers when one is wrong is consistent with Weaver and Qi's (2005) findings that non-participators were afraid of the disapproval of their peers.

Participants also offered some novel reasons as to why they did not participate that had not been articulated in previous literature. Two of these were not feeling responsible for participating, and avoiding or fearing continued participation, both of which were part of the theme of external context. Another three themes were reliance on solitary self-engagement, personal monitoring, and missed opportunities while overthinking, which were part of the theme of internal context.

On the one hand, personal monitoring, missed opportunities while overthinking, and avoiding or fearing continued participation are all subthemes that create an image of a student who would like to participate but may feel self-conscious about his or her abilities to engage competently in class. On the other hand, the subthemes of not feeling responsible for participating and reliance on solitary self-engagement paint a very different picture than that of the silent student who would like to participate but feels inadequate. Rather, they suggest that some students may not feel that class participation is a valuable part of their educational experience. Indeed, over half of the participants in my sample (including all three participants who cited not feeling responsible for participating) felt that participating in class had no effect or, indeed, a negative effect on their classroom experience. As the scope of my study was small and many students in my sample cited multiple themes and subthemes, further investigation with larger sample sizes would be necessary to determine whether there exist multiple unique student profiles of those who do not participate and whether their attitudes might be fundamentally and qualitatively different.

When participants were actually motivated to participate, they recounted various circumstances that encouraged them to do so. One was when participation was low stakes because they were likely to be ‘correct.’ This theme included having or building confidence, deliberating or rehearsing comments in one’s head, and, a major subtheme cited by 11 of my participants, knowing the answer or material. Additionally, participants would speak in class when participation was low stakes because their contribution required little thought; the categories that fell into this theme were, low risk participation such as reading off text, and spontaneous participation. And finally, there

were also mentions of other motivating circumstances, that I described as regular stakes participation, which involved being motivated by environmental context or being interested, passionate or excited about the topic. Participants' references to building confidence in order to participate is consistent with Weaver and Qi's (2005) finding that low participation can be explained by lack of confidence. Interestingly, although the professor's demeanor or behavior was brought up by participants in environmental context as a motivator for participating, professor-student rapport did not emerge as a major theme in the data as might have been expected based on Wilson, Ryan, & Pugh's (2010) findings. Additionally, no participant mentioned interaction with faculty outside the classroom as a motivator for participating more in class, which is inconsistent with Weaver and Qi's (2005) finding that a predictor of class participation was this outside interaction with a professor.

What was particularly striking was the emerging connection between participants' emphasis on the theme of wanting to avoid being wrong and low-stakes participation. That is, almost all of the low-stakes participation that students described (other than spontaneous participation where they spoke without thinking) seemed to be in situations where their risk of being 'wrong' was low. It seems like students who are silent in the classroom may feel they have a lot at stake in giving a correct or appropriate answer and that the consequences of being wrong are not worth the risk of putting themselves out there.

Along a similar vein, most of the participants in my sample were reluctant to correct a professor or other student's mistake in front of the class. It may be that their discomfort with being wrong extended to an empathetic desire to spare others of the

‘consequences’ of making a mistake in front of the class as well. An alternative explanation may be that this reluctance to correct the professor is in accordance with Weaver and Qi’s (2005) data showing a negative correlation between views of “professor as the authority of knowledge” and class participation. One of the items in their two-item measure involved not “openly question[ing] the professor’s views in regard to course material” (Weaver & Qi, 2005, p. 598). Perhaps it was to be expected that, among a sample of infrequently participating students, very few of them would feel comfortable questioning a professor’s authority in front of the class, even if the mistake was simple and straightforward. Perhaps their respect for authority was more powerful than their confidence in the infallibility of basic math.

Epistemological development

Part of the epistemological development portion of the interview was an attempt to investigate how these students thought about knowledge; in other words, how they decided something was right or true. They cited the following sources of knowledge: external authority, credible sources or trusted people, internal subjective decision, scientific research, evidence replication and consistency, and one participant articulated that she thought knowledge was contextual and complex. Although the epistemology portion of the interview was not coded for the women’s ways of knowing categories, certain themes emerged that did seem similar to the categories that Belenky et al. (1986) proposed. In particular, the belief that knowledge comes from external authority mirrors those of the receive knower in Belenky et al.’s (1986) model. The belief that knowledge comes from an internal subjective decision bears resemblance to the subjective knower in Belenky et al.’s (1986) model. The belief that knowledge comes from scientific research,

evidence replication and consistency might be typical of the procedural knower in Belenky et al.'s (1986) model. This category had by far the most mentions of any other epistemological belief. This is not surprising given that my participants were all psychology majors where the curriculum emphasizes scientific evidence through rigorous research and replication. Whether the students who spoke about this theme did so because of what they had been taught in their classes or because they had a general orientation towards knowledge that would fit the model of Belenky et al.'s (1986) procedural knower was beyond the scope of this study. Finally, it is fitting that only one participant in my sample articulated views that would be held by a constructed knower as this is a relatively rare epistemological perspective according to the Ways of Knowing Model. It seems that Belenky et al.'s (1986) theory still has a lot of relevance in today's student population. It is important to note, however, that one category emerged that did not fit cleanly into this model: knowledge comes from credible sources or trusted people. This belief seems to be in its own category as students articulated that once they deemed a source (or person) trustworthy, they usually believed the information that came from it. My findings also deviated from Belenky et al.'s (1986) model in that my participants often held multiple beliefs at once as there was overlap in who mentioned which ones. So, the categories in my study do not fit the unidimensional stage theory proposed by Belenky et al. (1986) because believing in one source of knowledge did not necessarily entail disbelieving another. Although I did not collect enough data to create an epistemological model for the students in my study, my rudimentary findings would be a better fit for a multidimensional theory (Greene, Cartiff, & Duke, 2018) where

participants may believe more or less strongly in multiple sources of knowledge at one time.

When asked how they decided to trust the expertise of their professors, participants mentioned education level or investment, time and experience in the field, expertise is communicated or evident, comparing professor's claims with other sources, and assumed expertise. Some of the themes mentioned here again bear some resemblance to what might be typical of the knowers in Belenky et al.'s (1986) model. Assumed expertise and education level would likely be articulated by receive knowers who give credence to authority. Expertise is communicated or evident could be something said by a subjective knower who is not using logic to determine expertise but rather making a judgement based on the professor's statements or behavior. Additionally, time and experience in the field and comparing professor's claims with other sources are ideas that would be characteristic of a procedural knower in Belenky et al.'s (1986) model who is trying to gather evidence to determine the credibility of the teacher.

Connections between epistemological development and class participation

The exploratory aim of this study was to investigate whether there were any connections between the way students thought about knowledge and expertise and their class participation habits. There were very few interesting patterns that emerged, but there were some findings worth mentioning. Fewer participants who cited external authority as a source of knowledge engaged in regular-stakes participation than those who spoke about other sources (and none of the students who spoke about external authority as a source for knowledge participated because of interest, passion or

excitement for the topic). Similarly, none of the students who said they just assumed their professors were experts reported participating because of interest, passion, or excitement about the topic. These results fit well with Weaver and Qi's (2005) research showing a negative correlation with views of professor as authority of knowledge and class participation. Additionally, they could suggest that students who assume expertise and give credence to external authority, might be very reluctant to be wrong, or not confident in their ability to discern and offer correct answers, and therefore, extremely unlikely to engage in regular stakes participation.

Interestingly, a large percentage of students who said they would compare professors' claims with other sources also said they would probably be willing to correct a professor's mistake in front of the class. But none of these students also reported participating out of interest, passion or excitement for the topic. These findings seem contradictory to what one might expect. An investigation as to why these students did not engage in regular stakes participation was beyond the scope of this study and is a possible avenue for future inquiry.

Limitations

This study had a number of limitations. The first is that the criteria for participating in the study - seldomly, rarely or never participating in class - were based on self-reports of the participants. As seen above, assessing the amount of one's class participation is a subjective judgment and it is likely that the participants varied widely in how much they actually participated. It may also be that some who participated in the study would not qualify as students who seldomly participate in other's eyes. Therefore, it was difficult to determine whether the amount of class participation was similar in

every subject. Perhaps a more rigid and quantitative criteria for participation, such as participating less than once a week, would have solved the above issues. Additionally, this was not a heterogeneous sample as 13 participants were female and only 1 was male. Although qualitative studies, due to their small sample size, are not generally assumed to be applicable to larger populations, it was my original aim to have a more equitable gender distribution in the sample. Another limitation was the amount of epistemological data collected in this study. As I only chose to include certain questions from Belenky et al.'s (1986) interview, I did not collect enough data to categorize my participants according to the types of knowers in their model. Being able to categorize participants as different types of knowers might have made a search for patterns between epistemological thinking and class participation behavior more straightforward. As such, the connection between these two fields is still murky.

Future Directions

This study's main contribution to the literature was to open a window into the complex and nuanced experiences of silent students in the classroom. The results of this study portrayed a diverse array of views of participation and classroom experiences that merit further investigation. The next step is to take these ideas and see whether they are applicable to a wider range of quiet students. It would be beneficial to explore reasons for non-participation from a quantitative perspective to gain a sense of how prevalent they are in the population in general. For instance, the themes and subthemes from the reasons for participating or not participating sections are likely adaptable to a questionnaire, which would allow a large sample of students who rarely participate in class to indicate whether they share those ideas or experiences.

Additionally, one could conduct a more in-depth approach to a qualitative epistemological inquiry and make a central aim to determine how students with different ways of knowing differ in their class participation habits. One might carry out a deeper investigation into the differences between students who say they would compare professor's claims with other sources and students who say they simply assume the expertise of their professors. Alternatively, the topic of being wrong could be explored more deeply from an epistemological perspective. What does it mean to be wrong? Why is it important not to be wrong? Finally, other future directions could involve taking a practical approach to the implications of my findings, creating and testing various forms of educational interventions designed around the ideas articulated by my participants.

Practical implications

If it is the case that a sizeable segment of quiet students do not think participating affects their experience in class (as did over half of my sample) and do not feel responsible for participating, professors can amend the way they present their courses at the beginning of the semester to include some information on the importance of participation and how it contributes to everyone's learning. Personal monitoring and missed opportunities while overthinking, on the other hand, might be consequences of students not feeling comfortable. If lack of comfort and self-consciousness are widespread among low-participating students, then professors could focus their efforts on making the classroom a more comfortable and inviting environment.

A particularly notable finding of this study was participants' emphasis on wanting to avoid being wrong even though the reality of the experience was never as bad as they thought. Along this same vein, quiet students participated more when it was low stakes,

either because they were fairly certain they were correct or because their participation required little thought. They participated much less in other circumstances, including when they were interested, passionate, or excited about the topic. To participate when the stakes are low means there's little risk of being wrong. This finding may be important from an educational context because, if professors can find a way to shift these student's perspective on being wrong to viewing mistakes or occasional inaccuracy as useful parts of the learning process, this might enable more quiet students to speak up in the classroom when they are interested or passionate about the topic without catastrophizing possible negative outcomes in their minds. An intervention might focus on dismantling the mythical and drastic speculated consequences of being wrong by explaining how important being wrong can be to learning, or, perhaps, by facilitating situations where students will be forced to make mistakes and frequently demonstrating that the consequences are not as bad as they anticipated.

Similarly, most of my quiet participants were also reluctant to correct others' mistakes in front of the class, which could imply that some amount of simple mistakes and misinformation go uncorrected in college classrooms, leaving students confused later. Faculty might consider inviting students to speak up if they see an error and rewarding them in some way by offering praise or gratitude when they do. This type of intervention could create a feeling of collaboration in the learning process where students understand that their contributions are of value and take responsibility for helping everyone in the class receive the 'correct' information, which, in turn, might foster more class participation in general.

Alternatively, professors might simply offer more opportunities for low-stakes participation allowing these quiet students to participate while remaining more in their comfort zones (T. Holmes, personal communication, April 17, 2020). Educators could ask students to free-write responses to questions before they are called on so they can be prepared to answer. Or they might also offer more opportunities for short answers or taking a poll of raised hands in class so students can express their opinions without having to worry about how to articulate them.

In sum, this study offers some novel insight into how students who seldomly, rarely or never participate in class experience the classroom setting. The above findings offer diverse avenues for further inquiry. And, pending their applicability to the broader population of students who are silent in the classroom, these results may have many practical implications for educators. It is my hope that researchers will be inspired to investigate how better to support quiet students in the classroom, and that more and more students will be encouraged to find their academic voices.

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Appendix

Semi-Structured Interview

Introduction and Background Information:

How old are you?

What gender do you identify with?

Do you have a preferred pronoun you would like me to use?

Where did you grow up?

What year are you in school?

What is your major?

Why did you sign up for this study?

Getting to know the student and his or her relationship to academics

Now we are going to move on from general questions and I'd like to try to get to know who you are a little better.

What do you spend the most time thinking about these days? [Prompt: are there things you find are on your mind a lot?]

How would you describe yourself to yourself? [Prompt: If you were to tell yourself who you really are, how would you do that?]

Is the way you see yourself now different from the way you saw yourself in the past?

[If yes] What do you think lead to the changes?

Now I'd like to know a little more about how you like to learn and how you feel about your classes.

How do you think you learn best in the classroom [prompt: class structure, professor's style etc.] And why is this the case?

When do you feel the most competent or smart in the classroom?

What was the best [whatever that means to you] class you ever took at New Paltz, and why?

Can you tell me about an in-school learning experience that has had a significant impact on your life? [prompt: is there something you learned that made you see or think about things differently]

Class Participation

Now I'd like to learn about your class participation habits.

Tell me about how often you usually participate in class?

Why do you think you don't participate (or don't like participating) in class?

What are the different ways that you participate in class? Feel free to simply list them

I want you to think about the classes you're taking right now: would you say that your participation level is the same across all of these classes? And why or why not? [Prompt: is there a type of classroom environment in which you're more likely to participate? Do you participate differently depending on the topic?]

In general, I want to learn more about what is it like for you when you do participate in class

How do you decide when you want to participate - what gets you to cross that line?

How do you feel while you are participating? [prompt: is it the same for all kinds of participation?]

How do you feel when the syllabus requires class participation as part of your grade?

How do you feel when you are called on or forced to participate?

Have you always felt this way [these ways] about participating in class?

[If no]: was there a moment when things changed for you (how you felt/how often you participated?)

Do you think participating [or not participating] affects your experience in class?

How do you feel when you're listening to your peers contribute in class?

How do you feel when you're asked to participate in a small group in class?

Is there anything you'd like to add about your experiences participating in class that we have not touched on?

Epistemological Development:

Now I want to know a little more about how you feel about truth and knowledge.

In the following scenarios I am going to present I may sometimes use the word expert or I may use professors as examples. If it sounds confusing or you can't think of anything with the example I've given, you can think of examples with professors or experts interchangeably.

How do you know something is right or true?

Imagine that a professor has made a simple mathematical error in his or her calculations when explaining something on the board. What would you do? And why?

And would you feel the same way if it was another student?

Imagine that a professor is describing research findings that contradict your personal experience. What would you do? And why?

In learning about something you really want to know, can you rely on experts?

How do you know [a professor] is an expert? [Prompt: How do you decide whether to trust what a professor is saying?]

What do you do when professors or experts disagree with each other?

When a student gives an opinion in class, how do you decide whether it is true?

Closing Questions:

The interview is almost over, I just want to make sure there isn't anything I am forgetting to ask you about.

Is there anything more about your beliefs around your academic experiences or the world in general that you would like to share with me today to give a picture of who you are?

Is there anything that we did not discuss today that you would like to add?