Quality Talk
Coding Manual

Analyzing the Talk in Quality Talk Discussions
ANALYZING THE TALK IN QUALITY TALK DISCUSSIONS:
A CODING MANUAL

June 29, 2017
PSU Studiocode Version 3.2


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Acknowledgements: This coding manual was primarily developed through support by the Institute of Education Sciences, U.S. Department of Education, through Grant R305A130031 and the National Science Foundation, through Grant No. 1316347 to the Pennsylvania State University, as well as a former grant from the Institute of Education Sciences, to the Ohio State University, Grant R305G020075. Any opinions, findings, and conclusions or recommendations expressed are those of the author(s) and do not represent the views of the Institute, U.S. Department of Education, or the National Science Foundation.

Note: Construct definitions included in this coding manual were adapted from: Soter, A., Wilkinson, I. A. G., Murphy, P. K., Rudge, L., & Reninger, K. B. (2006). Analyzing the discourse of discussion coding manual (version 19). The former manual was designed primarily for coding discourse transcripts in Nvivo and limited to discussions in language arts classrooms whereas the present manual is designed for coding videorecordinos of discourse from language arts and science in Studiocode. While our conceptualization of the constructs is consistent with the 2006 version of the coding manual, aspects of coding have evolved due to the nature of coding transcripts compared to videos, and we have also refined our understandings of some discourse elements, particularly as they unfold in science classrooms. Thus, a new coding manual was developed to address these differences.
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KEY FOR CODING TIPS IN STUDIOCODE

![An exclamation point next to a coding tip indicates an explicit instruction or rule that must be followed when coding.]

![A star next to a coding tip indicates an important explanation that may aid in deciding if a particular code is appropriate.]

![A pencil next to the text indicates additional helpful information about a question or response type.]
Coding Question Events

The core of our coding scheme is centered on coding question events based on questions and the responses that they elicit. After question events are identified, they are given a primary code based on whether they are authentic questions or test questions. Once the events are assigned a primary code, they may also be given a secondary code. We also code whether questions are teacher-initiated or student-initiated and certain response types. Questions that do not elicit responses about, around, and with the text are not coded.

Question Events

Definition
A question event is a talk episode that begins with an initiating question (i.e., stated or implied) and includes all responses to the question.

Rather than coding questions in isolation, entire question events or “interactions surrounding the questions” (Nystrand et al., 2003, p. 144) are examined, allowing for a more comprehensive understanding.

When coding a question and determining the nature of the question, the cardinal rule is to look at the entire question event—the question and the responses that the question actually elicits.

Primary Questions
Question events are given a primary code based on whether they are authentic questions or test questions.

Secondary Questions
Once the events are given a primary code, they may also be given a secondary code (e.g., uptake or high-level thinking).

Question Types

Primary Questions
- Authentic Questions
- Test Questions

Secondary Questions
- High-Level Thinking Questions
- Uptake Questions
- Connection Questions

Speculation  Generalization  Analysis  Personal Experience / Affective  Shared Knowledge  Inter-textual

doi.org/10.18113/S1XW64
Start the event at the beginning of the question, and end the event at the end of the last response to that question. Events often end just prior to the next question, topic shift, or interruption.

A question event must have at least two unique participants.

When an individual asks multiple questions within the same turn, this is called a **compound question**. Code as a single question event beginning at the first question.

When an individual asks and revises a question before giving anyone an opportunity to respond, this is called a **repaired question** (Nystrand, 2002). Code as a single question event beginning at the initiation of the first question.

When a question event is identical to one already asked and coded, the **repeated question** is not coded unless it elicits unique responses, different from the previous question event. If the responses are unique, code according to the new responses.

When a question event is initiated in the form of a declarative statement, this is called an **implied question**. Certain phrases (e.g., “Compare these characters,” or “I’m wondering if...”) often serve as signals for implied questions.

Responses within a question event may be in the form of a question or a series of questions. The coder needs to decide whether the question or questions are **responses** within that same question event (e.g., they build on the same question) or if they initiate a new/different question event (e.g., shift the flow).

Not all questions elicit question events. Some questions are not informative of high-level comprehension or may be better captured by other codes (e.g., teacher moves).

The below question types are not coded.

- When a question is asked and answered by only one participant, the question is not coded.
- When a question is asked and no one responds, the question is **aborted**. This includes questions that are responded to by only verbalized non-responses such as, “I don’t know” or “I’m not sure.”
- When a participant interjects a non-content question, the question is a **procedural question**. This often happens when the teacher is trying to manage the flow of the discussion (e.g., “Can you repeat the question?”).
- When a question is asked without an expectation/opportunity for others to respond, the question is rhetorical. This may include questions that are answered by a choral response (e.g., “Yes!” in unison). They are often heard when an individual has a verbal pattern of speech such that their verbalizations end with questions (e.g., “ok?” or “right?”).

All question events should be identified as either teacher- or student-initiated in Studiocode using the label feature. Coders must label all teacher-initiated questions, as unlabeled events are, by default, implied to be initiated by students during Studiocode exporting.
Question Event: Primary Codes

All coded question events are given a primary code based on whether they are authentic questions or test questions.

Authentic Questions

An authentic question is an open-ended question that requires thinking about, around, and with the text or content. An authentic question does not have one correct answer.

Test Questions

A test question presupposes one or a set of correct answers. The answer to a test question usually can be found in the book or textbook.

Authentic questions and test questions are, by definition, mutually exclusive.

Authentic Questions (AQ)

Definition

An authentic question is one in which the person asking the question does not know the answer or is genuinely interested in knowing how others will answer; in other words, the answer is not pre-specified. According to Nystrand (personal communication, March 12, 2004), almost all student questions can be assumed to be authentic by default. Quite frequently (but not always) an authentic question allows for a range of responses and generates several responses before another question is asked.

(Soter, Wilkinson, Murphy, Rudge, & Reninger, 2006, p. 15)
While common, it is not a required condition that authentic questions elicit multiple, varied responses.

Authentic question events can be regarded as analogous to continuous data.

**Discourse Examples of Authentic Questions**

Q: “Why doesn’t a neon light always glow as brightly?”

R₁: “The amount of electricity going through it could be different.”

R₂: “It could just get worn out like a light bulb.”

Q: “What did you think was worse: the Titanic or the Edmund Fitzgerald?”

R: “I thought the Edmund Fitzgerald was worse because they went sailing when they were not supposed to. It was only a couple of years ago, so it should have been more advanced and prepared.”

**Coding Authentic Question Events in Studiocode**

⭐ By default, most student-initiated questions are coded as authentic.

❗ Only one authentic question event can be coded at any given time; it is not possible to have two overlapping or simultaneous authentic question events in Studiocode.

✔ If a question elicits at least one authentic response from a student, the event is coded as an authentic question.

✔ Authentic question events may have multiple secondary codes, including uptake, HLT/speculation, personal experience/affective, and connection/inter-textual or shared knowledge.
Test Questions (TQ)

Definition

A test question is an inauthentic question in that it presupposes a particular answer.

(Soter et al., 2006, p. 16)

Test questions do not allow students “control over the flow of the discussion” (Nystromand, 2002, p. 23).

Test questions often elicit recall or restatement of specific information.

In contrast to authentic questions, test questions are analogous to “discrete” data.

Discourse Examples of Test Questions

Q: “What is the definition of nuclear fission?”
R: “It's the breaking down of the nucleus.”

Q: “What was their initial goal for inventing the machine?”
R: “That they would get first place in the science fair.”
Coding Test Question Events in Studiocode

🌟 Test questions often occur when the teacher is thinking of an answer and wants the students to provide this answer. One way to discern that this is the case is if the teacher subsequently evaluates or affirms the answer(s) to the question.

☒ Students can ask test questions if the question has a factual or text-based answer. However, if other students respond by giving multiple answers, even short or simple ones, with more than one being acceptable, it is not coded as a test question.

❗ Like authentic question events, only one test question event can be coded at any given time. However, in Studiocode a test question event can be subsumed within an authentic question event.

☒ Test question events are not given any additional codes (i.e., secondary codes or response codes).
As stated in the previous section, authentic question events may also be given secondary
codes in any combination, except when noted otherwise in the coding manual. Use caution
in assigning secondary codes based on follow-up responses by the teacher or student who
initiated the question. This section includes information on the following secondary
codes:

- Uptake (UT)
- High-Level Thinking (HLT)
  - Speculation (SQ)
  - Generalization
  - Analysis
- Connection (CQ)
  - Personal Experience (PE) / Affective (AF)
  - Shared Knowledge
  - Inter-textual
Uptake occurs where the person asking the question asks about something that someone else said previously (Nystrand, 2002). To qualify as uptake, the person must ask about something that someone else said, not what he or she said previously (a person cannot uptake themselves).

(Soter et al., 2006, p. 17)

Uptake questions must be content related and can be directed to a group or an individual.

A key feature of uptake is that it dialogically opens the floor for additional ideas and comments by discussion group members.

**Discourse Examples of Uptake Questions**

R: “Every airbag increases the time it takes for you to hit the steering wheel.”

Q: “But how does it increase the time to impact?”

Q1: “What if Paul Revere failed his mission?”

R1: “That would be really bad. Maybe...the British would take over...”

Q2: “Would he be as popular?” (Uptake)

R2: “No. I think we would be overruled by the British today though. It would not be too bad, like Britain today is not that bad. No one would like, tell us what to do. We just would not be as strong as a country.”

doi.org/10.18113/SiXW64
Authentic Question Event: Secondary Codes

Coding Uptake Question Events in Studiocode

Because uptake is when a teacher or student asks a question about something someone else said previously, pronouns can often serve as signals to coders that individuals are referring to previous questions or responses (e.g., “Why do you think that?”).

Uptake often occurs immediately following the response/statement/question that is being taken-up by the speaker. However, when this is not the case, an uptake question still can be coded if the reference to the previous statement is explicit (e.g., using a participant’s name or quoting a participant’s comment).

If a participant follows up on something someone else read (e.g., reading may occur during discussion when students use excerpts from the readings for evidence), it is not considered an instance of uptake because the speaker is not building on something someone else said or asked. According to Nystrand (2002), it's only uptake if the speaker is building on something a participant initiated.

Procedural and clarifying questions are not uptake because they do not address the content of what someone said previously.

doi.org/10.18113/S1XW64
A high-level thinking question... generates generalization, analysis, or speculation. A question can be judged to be a high-level thinking question if it elicits new information, rather than old information, and if it cannot be answered through routine application of prior knowledge (Nystrand et al., 2003).
(Soter et al., 2006, p. 19)
Speculation Questions (SQ)

A speculation question requires student[s] to consider alternative possibilities and perhaps, though not necessarily, weigh them. It is for the most part open-ended in the sense that it can lead anywhere. A speculation is a thinking stratagem in which the speaker proposes a potentially valid analogic utterance without feeling that s/he must push toward a firm conclusion or relate the response to a closed logical system. The speculation might have a theoretical orientation, one that uses a formulation as a basis for a subsequent prediction and/or extrapolation (Britton et al., 1975). The question thus elicits a proposition that needs to be tested against other propositions, potentially yielding hypotheses, and ultimately generating new assertions (Britton et al., 1975).

(Soter et al., 2006, p. 20)

A common example of a speculation question is, “What if?”

Speculation questions require students to generate more than one plausible possibility to address the question.

Discourse Examples of Speculation Questions

**Q:** “What if there was no disk in the hot pack? Do you think a different type of energy could start the reaction?”

**R₁:** “Maybe you could use an electric spark.”

**R₂:** “Maybe you could throw it really hard against something.”

**Q:** “What if the big horse did not get destroyed?”

**R₁:** “Then I think he would have been a lot happier.”

**R₂:** “He still may be depressed because he used all that metal and would not be able to finish for a really long time.”

doi.org/10.18113/S1XW64
A generalization question requires students to engage in inductive reasoning, to build up ideas rather than to break them down. It encourages students to tie things together rather than simply to restate information. A generalization is a derivation of a general conception or principle from particulars, typically in response to an open-ended question: What’s the point? (without setting conditions). (Nystrand, Class 4.0 Coding Manual, 2002). A generalization question in effect asks “What happens?,” or “What do I make of what happens?” (Soter et al., 2006, p. 19)

In language arts, generalization questions are often about the main idea, the characters’ personalities, or the relationship between characters.

In science, generalization questions are often about how students apply a concept or phenomenon to a broader setting.

Discourse Examples of Generalization Questions

Q: “How much energy goes into creating the loud ‘boom’ from the explosion?”
R: “Well, if you have a bomb made of gas, it has a large fireball. If the bomb is C-4, it has a big shockwave. And the thing about the nuclear ones is that they have all of them. It’s a fireball, it’s loud, and it has a shockwave.”

Q: “How would you describe the Queen of the Sea?”
R: “I think I would describe her as a nice, humble lady because her daughter was suffering, and she gave her what she needed to stay with her husband.”

doi.org/10.18113/S1XW64
An analysis question requires students to engage in deductive reasoning, to break down concepts, ideas, or arguments rather than to build up ideas. It requires more than the restatement of known information (Nystrand, et al., 2003). Analysis is the determination of the nature and relationship of parts in a whole, entailing two or more stipulated particulars: Given what we’ve just said, given a, and b, what’s the author’s point? (Nystrand, Class 4.0 Coding Manual, 2002, p. 25). An analysis question in effects asks “Why does it happen?” (Soter et al., 2006, p. 20)

Analysis questions stimulate students to include analyses in their responses that are evident in their breaking down of ideas or concepts by considering different ideas in the text and talking about how they relate to each other.

**Discourse Examples of Analysis Questions**

Q: “How does the airbag increase the time it takes to move forward?”
R: “When you hit the airbag, since it’s deflating, it’s still technically letting you move forward. So, when you hit it, you’re moving forward still, just slower, because the small holes let the gas escape slowly to cushion your force.”

Q: “Do you think his models were pretty close to the real thing?”
R: “Yes, because they look like the ones in our museums. We have more research now, and some of the ones in here look like the ones from the research and museums.”
Authentic Question Event: Secondary Codes

Coding HLT Question Events in Studiocode

- When coding HLT questions, generalization and analysis questions are collapsed into one secondary code (i.e., HLT); however, speculation questions are coded into a separate category (i.e., SQ).
- An authentic question event can never be double coded with more than one type of HLT secondary code (i.e., you cannot have an AQ that is SQ and HLT) because speculation, generalization, and analysis are all sub-classifications of HLT as a whole.
- If students respond to an authentic question event with evidence of speculation, generalization, and analysis, the coder must determine whether to apply the secondary code of SQ or HLT. If the question elicits many speculation responses but one or two weak generalizations, the question should be coded as a speculation question. However, if responses are fairly equally distributed or most of the responses are generalization or analysis, the default should be the secondary code of HLT.
- Speculation questions must result in responses with more than one possibility to address the question; one or more responses should consider alternative possibilities. It is not appropriate to code a speculation question when only a single possibility is speculated.
- A teacher response that indicates SQ/HLT is not sufficient for a secondary code of SQ/HLT without additional student high-level thinking responses.
A connection question is a type of authentic question event where students generate responses that connect the text with things that they have previously read, seen, heard, or experienced. The connections can be with things that have been produced (i.e., inter-textual), experiences they have shared with each other (i.e., shared knowledge), or individual past experiences (i.e., personal experience or affective).
Personal Experience Questions (PE)
Affective Questions (AF)

Definition

[Personal experience / affective questions elicit] information about students’ feelings or [information] about their lives in relation to the text they have read (cf. Taylor, Pearson, Clark, & Walpole, 1999).
(Soter et al., 2006, p. 21)

Given the variations in the nature of the content domains, the science team uses the term personal experience question, while the language arts team uses the term affective question. However, the rules that govern the coding of these question types remain consistent despite the different labels.

Discourse Examples of Personal Experience Questions / Affective Questions

Q: “Have you ever seen electrical discharge other than in the video demonstration?”
R: “Well last night I was angry because when I was trying to go to bed there were bright flashes of lightning in my window keeping me awake. It got me thinking that maybe what causes us to see the electrical discharge is that those molecules were in an excited state, and therefore released the light.”

Q: “How would you feel if you were trying to solve the case in the story?”
R: “I would feel a lot of pressure and stress because everybody would be looking at me, and usually, I do not do very well on stage because I have stage fright.”

doi.org/10.18113/S1XW64
Shared Knowledge Questions (CQ)

**Definition**

A shared knowledge question... elicits reference to information that may be assumed to be common knowledge [among the students in a given discussion] (Edwards & Mercer, 1987).

(Soter et al., 2006, p. 22)

**Discourse Examples of Shared Knowledge Questions**

Q: “What is a colloid?”
R₁: “In our chemistry class last year, Mrs. Butler showed us the experiment with her chalk board erasers – she hit them together and shined the light through to show the colloid.”
R₂: “There was also an example of a colloid in our book last year – you could see if it was when you shone light through it.”

Q: “What did you think of the talent show?”
R₁: “It was good but kind of childish. I think our talent show had a lot more singing and stuff like that in it. We even had someone do baton.”

**doi.org/10.18113/S1XW64**
**Definition**

An inter-textual reference question is a question that elicits reference to other literary or nonliterary works, other works of art, or media, such as billboards, television, newspapers or magazines (Rogers, 1991). Making connections between chapters on discrete topics within a content area text (e.g., social studies) would qualify as an inter-textual reference. In effect, an inter-textual reference question makes connections with other textual material. (Soter et al., 2006, p. 21)

It is helpful to think of a text as something that has been produced (e.g., movie or book).

**Discourse Examples of Inter-textual Questions**

Q: “Do you think that both reflection and retraction are happening?”

R: “Um, I think that in here (pointing to the nail polish card), just like this picture (pointing to the article), it’s showing the light hitting the nail polish and that’s, like, what makes us see color. But, like, with the refraction part, in the picture at least, it looks like it’s going through the glass prism, and then the colors come out. But, on the card, the light is just hitting the card, which makes us see the colors. So, I think it’s more reflection.”

Q: “Does this story remind you of another story you have read?”

R₁: “I said in my question that it reminded me of *Ice Age* because they kind of went deep down under the earth and saw a whole bunch of different creatures.”

R₂: “Yeah, I thought it related to *Ice Age* too because I’m pretty sure there was a monster and a crocodile under the ice, and it sort of looked like the dolphin in the story.”

doi.org/10.18113/S1XW64

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When coding connection questions, inter-textual and shared knowledge questions are collapsed into one secondary code (i.e., CQ); personal experience or affective questions are coded into a separate category (i.e., PE or AF).

An authentic question event can never be double coded with more than one type of connection secondary code (i.e., you cannot have an AQ that is CQ and PE or AF) because these personal experience/affective, shared knowledge, and inter-textual questions are all sub-classifications of connection questions as a whole.

For example, if students respond to an authentic question event with evidence of personal experience and inter-textual connections, the coder must determine whether to apply the secondary code of PE or CQ.

Some questions may appear to be connection questions (e.g., they state a connection between two texts within the question) but do not result in responses in which connections are made (e.g., between two or more texts). As such, these questions are not connection questions.

Likewise, questions may not appear to be connection questions in nature but result in responses that indicate a connection was made (e.g., student gives evidence from a shared experience). In this case, it is still coded as a connection question because the responses indicate a connection was made.

Personal experience and affective questions must contain a reference to an individual student’s feelings or their own lives.

If all responses in an event are solely related to emotions or experiences of a character and not feelings or experiences held by the participants of the discussion, the question event is not coded as PE or AF.

Shared knowledge questions must contain a reference to previous discussions, topics, knowledge, or experiences that the students share with each other.

Shared knowledge is often signaled by students’ use of the pronoun “we” or “our” in describing their previous understandings or experiences.

Inter-textual questions only include references to texts that are tangible; conversations do not count as text. Students must explicitly reference the inter-textual text (e.g., “When my dad and I watch Westerns...” or “I saw a painting that...”).

For science discussions, lesson documents, materials, and media (e.g., videos, individual articles, demonstrations, or the textbook) are each considered a single text. Importantly, data derived or taken from one of the sources are considered part of that text. Thus, an inter-textual response must explicitly make a connection between at least two different texts in science content areas.

A teacher response that makes a connection is not sufficient to code the question event as PE/AF or CQ without additional student responses about the connection.
The coding employed in this manual is loosely based on Toulmin’s (1958) argument framework and rooted in Chinn and colleagues’ work (Chinn & Anderson, 1998; Chinn, O’Donnell, & Jinks, 2000) on argumentation.
Elaborated Explanations (EE)

Definition

[Elaborated explanations are] instances in which students explain their thinking in fairly coherent form to others. Elaborated explanations occur in a single turn where a student explains how he or she arrived at a conclusion or idea by giving a step-by-step description or detailed account of how the conclusion or idea was reached or how a problem might be resolved (cf. Webb, 1991). They are elaborated descriptions of how things work, why some things are the way they are, or how they should be thought about. They include details of how to think about an issue and justification or rationale for thinking that way. Note that elaborated explanations relate to the quality of explanations given by an individual student, not a collective of students, and not the teacher.

(Soter et al., 2006, p. 23)

Discourse Examples of Elaborated Explanations

“I don’t really think that would happen [claim] because of the wavelengths [reason¹] and just how fast light is going [reason²] that light waves could actually hit each other that often.”

“I would probably feel pretty fortunate [claim] because my family was given the opportunity to go out west and start this new life [reason¹]. I would not think of the chores as boring. I would think of them as fun because of the space I had to do them in [reason²].”
Elaborated Explanations in Studiocode

- Elaborated Explanations can only occur within authentic question events; responses to test questions cannot be coded as EEs.
- Elaborated explanations begin at the start of the claim and continue through the end of the speaker’s turn, unless the topic shifts away from that claim (e.g., the speaker initiates an alternative claim), in which case the EE should end after at the last piece of support for the claim.

🌟 Elaborated explanations may take various forms (see Soter et al., 2006):
- Claim + 2 or more independent reasons
- Claim + 2 or more conjunctive reasons
- Claim + 2 or more causally connected reasons
- Claim + reason(s) + evidence
- Claim + reason(s) + warrant
- Claim + evidence + evidence

- In the case in which a student reads from the text in support of a claim with a corresponding reason, this is considered an EE in the following form: claim + reason(s) + evidence.
- In the case in which a student explicitly states a warrant in support of their claim, this may be considered as a piece that contributes to the EE. Such an explicit statement offers a greater articulation of the students’ thinking than an unstated warrant and is considered an EE in the following form: claim + reason(s) + warrant.

⚠️ Elaborated explanations must include all components within a single “turn.” If this way, if an interruption occurs during what might be an EE, it is not considered an EE. Commonly, a student may start an explanation and provide a claim or a reason without producing a full EE. If the teacher verbally prompts the student for more before the full EE is produced, this is not an EE because of the teacher’s influence on the talk, even if the student continues by adding evidence to the explanation.

- In discourse, there is a significant amount of give and take and “holding the floor.” If a speaker “holds the floor” while others in the discussion make utterances this may not be not considered an interruption as long as others’ utterances do not affect the flow of the student’s response.
- If the student is interrupted by something (e.g., bells ringing, teacher managing the classroom), but then continues immediately after the interruption, count the two utterances as one turn for that speaker.

🌟 A claim may be implied in verbal discourse when it immediately follows a question. In the case in which a student responds to an understood claim (i.e., the question) by giving evidence and reasons without explicitly making the claim, it is considered to be implied. However, the response must directly respond to, or follow from, a question within the same question event.

- Listening for various reasoning words during coding may help coders identify the components of an EE (see Appendix A).

doi.org/10.18113/S1XW64
We also want to code episodes of ‘exploratory talk,’ instances in which students co-construct knowledge together. Mercer (2002) defines exploratory talk as talk “in which partners engage critically but constructively with each other’s ideas. Relevant information is offered for joint consideration. Proposals may be challenged and counter-challenged but, if so, reasons are given and alternatives offered. Agreement is sought as a basis for joint progress. Knowledge is made publicly accountable and reasoning is visible in the talk” (p. 150). So exploratory talk “embodies a kind of ‘co-reasoning,’ with speakers following ground rules which help them to share knowledge, evaluate evidence, and consider options in a reasonable and equitable way” (Mercer, 2000, p. 153). In essence, it is a way of using language to think collectively—to ‘interthink.’

Mercer and colleagues (e.g., Mercer, Wegerif, Dawes, Sams, & Fernandez, [2012], p. 7) describe exploratory talk as having six features. He uses these features to establish ground rules for talk in problem-solving contexts. We have adapted these features to reflect the exploratory talk that occurs in text-based discussions. The following six features should be apparent in episodes of exploratory talk:

1. Students share relevant information;
2. Students consider each other’s ideas and collectively explore a topic, theme, or issue;
3. Students give reasons for their ideas or opinions;
4. Students challenge each other’s ideas or opinions;
5. Alternatives are discussed;
6. Students encourage each other to speak and to put forward their views.

(Soter et al., 2006, pp. 28-30)

doi.org/10.18113/S1XW64
Exploratory talk occurs when students share, evaluate, and build knowledge over at least three turns. Students reason collectively by challenging each other and responding to challenges with reasons and evidence.

**Discourse Examples of Exploratory Talk**

**R1:** “I don’t think light bounces off each other because of the wavelengths and the fast speed of light.”

**R2:** “I think it would though, because I thought it said something about how light bounces off and that’s what causes us to see color.”

**R3:** “Well, it kind of shows here in the model that the arrows of light would go toward each other, but none of the diagrams in the articles show the light going toward each other. They show the light going toward a particle or something.”

**Q:** “Does Seeker of Knowledge remind you of Navajo Code Talkers?”

**R1:** “This story does remind me of Navajo Code Talkers because they are both codes. I mean, this one is on paper and it was hard for them to figure it out, and the Navajo code talkers had to figure it out and stuff.”

**R2:** “I disagree, because in Navajo Code Talkers it’s all about 29 men trying to figure out one code, and in this story, it is one man trying to make his dream come true about discovery. And in Code Talkers it’s about 29 men trying to figure a code out, so other people would not know what they are saying, and this is about one man trying to break the code, so people would know who he was.”

**R1:** “But it says in the story that there were many other people... like, scholars and Napoleon were also trying to figure it out.”
Exploratory talk episodes consist of instances where students co-construct understanding over at least three consecutive, uninterrupted turns about the same topic.

The key component of exploratory talk is the element of challenge. Only one challenge statement is necessary for an episode to be classified as exploratory talk. Without the challenge, the episode may be better classified as cumulative talk or disputational talk.

Begin coding episodes of exploratory talk with the utterance that elicits the challenge (i.e., the turn immediately before the challenge).

Exploratory talk episodes end when the topic shifts, someone asks a different question, a statement is made that deviates from the trajectory, or the students arrive at consensus.

Exploratory talk is characterized by students actively constructing knowledge. Students are primarily interacting with, and talking to, each other. While the teacher is often present, she is not influencing the discourse or episode of talk. When the teacher does interject in an ET, the coder needs to make a decision about whether the teacher’s comment disrupts, and consequently ends, the episode.

If the students’ talk is not altered by the teacher’s interjection (e.g., the students ignore the teacher) or if the teacher is genuinely contributing as an equal participant rather than authority, the episode should not be terminated at the teacher’s interjection.

Alternatively, if the teacher’s interjection redirects or alters the direction or content of the episode, then the event should be ended.

Student encouragement is possible, but it may not always be present in exploratory talk in text-based discussions. This feature is more germane to the problem-solving contexts studied by Mercer (2000), thus it is not a required component for coding ET in this coding manual.

A student must initiate the challenge. Thus, there is no use of the teacher label in identifying instances of ET when coding.
Coding Responses

Cumulative Talk (CT)

Definition

[As noted previously,] cumulative talk is characterized by speakers building positively but uncritically on what the other has said. Participants use talk to construct ‘common knowledge’ by accumulation. Cumulative talk has a lot of repetitions, confirmations, and elaborations.

(Soter et al., 2006, p. 29)

An important distinction between cumulative talk and exploratory talk is that cumulative talk lacks the element of challenge inherent in exploratory talk.

Referring back to Mercer and colleagues’ description of exploratory talk (noted on p. 27), cumulative talk is typified by the first three characteristics.

Discourse Examples of Cumulative Talk

R₁: “I think the neutrons would be released and then go to another atom. They would break that atom up and just keep going.”

R₂: “Yeah, like in a chain reaction.”

R₃: “Oh yeah, because if they went to go hit another atom, then it could create an even bigger explosion.”

R₄: “Exactly. So, with the ping-pong balls, you start with one, and then that splits and you have three separate ones and then those go to other atoms and they split as well – it just keeps going and going.”

Q: “Why did Tony buy back his grandma’s bracelet?”

R₁: “Because he knew that his grandma was feeling really sick and that she missed her bracelet. He wanted to get it back for her so that she would not be as sad about being sick.”

R₂: “Because she had had the bracelet for a long time.”

R₁: “She had a lot of good memories of it, so it would help her not be so sad.”

doi.org/10.18113/S1XW64
Cumulative talk episodes consist of instances where students co-construct understanding over at least three consecutive, uninterrupted turns about the same topic.

The key component of cumulative talk is the element of building *without* challenge.

Cumulative talk episodes end when the topic shifts, someone asks a new question, a statement is made that deviates from the trajectory, or the students arrive at consensus.

Cumulative talk is characterized by students actively constructing knowledge. Students are primarily interacting with, and talking to, each other. While the teacher is often present, she is not influencing the discourse or episode of talk. When the teacher does interject in a CT, the coder needs to make a decision about whether the teacher’s comment disrupts, and consequently ends, the episode.

- If the students’ talk is not altered by the teacher’s interjection (e.g., the students ignore the teacher) or if the teacher is genuinely contributing as an equal participant rather than authority, the episode should not be terminated at the teacher’s interjection.
- Alternatively, if the teacher’s interjection redirects or alters the direction or content of the episode, then the event should be ended.

Like EEs and ETs, there is no use of the teacher label in identifying instances of CT when coding.
<table>
<thead>
<tr>
<th>Teacher Moves (TM)</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Summarizing</strong></td>
<td>is used when the teacher tries to slow the group down and overviews a part of the discussion to help build coherence.</td>
<td>“Let’s pause and summarize what we’ve said...”</td>
</tr>
<tr>
<td><strong>Modeling</strong></td>
<td>is used when the teacher explicitly models a discourse behavior for the students. Generally, the teacher must make the intention of modeling clear.</td>
<td>“I’m going to ask an uptake question...”</td>
</tr>
<tr>
<td><strong>Marking</strong></td>
<td>is used when the teacher reinforces specific aspects of a student’s discourse by explicitly pointing it out.</td>
<td>“That was great use of evidence from the articles, Ruth!”</td>
</tr>
<tr>
<td><strong>Prompting</strong></td>
<td>is used when the teacher helps a student construct a longer response or a response that includes evidence from the text/data, thereby supporting more sophisticated talk.</td>
<td>“Why do you think that?”</td>
</tr>
<tr>
<td><strong>Challenging</strong></td>
<td>asks a student or group to consider another point of view.</td>
<td>“I’m not sure I quite agree with you. Have you considered...”</td>
</tr>
</tbody>
</table>

Only code teacher moves promote higher-level thinking and productive conversations. However, since little research has addressed the teacher’s role in the discussion, we believe the following moves address this goal.

[doi.org/10.18113/S1XW64](doi.org/10.18113/S1XW64)
Coding Teacher Moves

Coding Teacher Moves in Studiocode

- Teacher moves are not coded by sub-type. Only the teacher move code is used in Studiocode. However, the different teacher moves are described in detail to provide assistance in identifying the teacher moves to code in the discourse.
- Prompting as a teacher move is different from uptake—uptake questions are content based and open the dialogic floor whereas prompting elicits a continuation or elaboration.
- When teachers prompt an individual student or the group using specific Quality Talk discourse management tools (i.e., “Why do you think that?” and “How do you know that?”), the move is coded as a teacher move.
- Procedural teacher moves are not coded. These moves manage classroom behavior or the discussion, and they do not necessarily enhance and promote higher-level thinking.
- Teacher moves are, by definition, initiated by the teacher, and so it is unnecessary to label the events as teacher initiated.
- Teacher moves can be present within question events.
References


doi.org/10.18113/S1XW64
References


APPENDIX A: Reasoning Words

Reasoning Words that may signal EEs

- I think
- I agree
- I would / could / might
- Like
- So
- But
- If
- How
- Because
- Why

Elaborated Explanation
APPENDIX B: Coded Transcript Example Excerpt from Quality Talk Science Teacher Coding Workbook

Transcript #6 (Topic: What causes the appearance of multiple colors in a layer of colorless nail polish when it is observed under white light?)

<table>
<thead>
<tr>
<th>Turn</th>
<th>Speaker</th>
<th>Notes</th>
<th>Codes/Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Teacher</td>
<td>Okay so your, just to kind of restate what you said, your issue is that you think there's reflection happening and the model talks about refraction.</td>
<td>TM</td>
</tr>
<tr>
<td>2.</td>
<td>Student 3</td>
<td>Mmhmm.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Teacher</td>
<td>Do you think both are happening, or just reflection or what?</td>
<td>AQ/HLT/CQ/UT</td>
</tr>
<tr>
<td>4.</td>
<td>Student 3</td>
<td>I mean I think that... I think that both are kind of happening because we see, like, the full spectrum here, which is kind of like refraction. But even in her picture, like, you can tell that that looks like it's, like, reflecting. Like, the white light comes and, like, reflects the different colors off of the foil.</td>
<td>EE</td>
</tr>
<tr>
<td>5.</td>
<td>Student 2</td>
<td>I feel like it's both because it's, like, in the picture under refraction it shows, like, a clear prism and the light's going through it and causing different colors, like a rainbow. But it's also bouncing off of the construction paper on the bottom, and that's what was giving it a reflection bouncing off.</td>
<td>EE</td>
</tr>
<tr>
<td>6.</td>
<td>Student 4</td>
<td>Yeah, I definitely think it's both too, because with reflection it says it's hitting an object and bouncing off, which is what's happening in the picture, definitely. And then refraction is when it hits, it passes from one medium to another and it's, like, the light is going through the air and then it bounces off of the, like, nail polish and then it, like, refracts, so I think it is both.</td>
<td>EE/ET</td>
</tr>
<tr>
<td>7.</td>
<td>Student 1</td>
<td>Um, okay, I think that, like, in (the article), just like this picture, it's showing the light hitting the nail polish and that's, like, what makes us see the colors. But, like, with the refraction part, like, in the picture at least, it looks like it's going, like, through the glass...</td>
<td>EE</td>
</tr>
<tr>
<td>8.</td>
<td>Student 2</td>
<td>Prism?</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Student 1</td>
<td>Yeah, prism. And then, like, the colors come out. But, like, on the card the light is just hitting the card, which makes us see the color. So, I think it's just more reflection because of that.</td>
<td>EE</td>
</tr>
<tr>
<td>10.</td>
<td>Student 3</td>
<td>I mean I think it's refraction just because — I mean, like, both — but, like, it is refraction too, because we're going from white light into the oil, and then that causes the color. And so, I think because it's going from the white light to the different colors, that's why it's refraction. But then it's reflection as well because they're reflecting back, and that's why we can see them.</td>
<td>EE</td>
</tr>
<tr>
<td>11.</td>
<td>Student 4</td>
<td>Yeah, and then (the reading) says, like, for refraction also, whenever it goes through, like they use the glass example again, when it goes through the light it is separated into the colors of the rainbow because it's changing direction. And that's, like we see the rainbow (in the model), so I think that's what's happening.</td>
<td>EE</td>
</tr>
</tbody>
</table>
## APPENDIX C: Coded Transcript Example Excerpt from Quality Talk Language Arts Teacher Coding Workbook

**Transcript #4 (Text: Titanic)**

<table>
<thead>
<tr>
<th>Turn</th>
<th>Speaker</th>
<th>Notes</th>
<th>Codes/Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Student 3</td>
<td>Um, I have a question. Would you have wanted to go on the <em>Titanic</em> not knowing it would sink?</td>
<td>AQ/AF</td>
</tr>
<tr>
<td>2.</td>
<td>Student 4</td>
<td>Um, yeece...</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Student 3</td>
<td>I would because, like, like you hear it is called the unsinkable. It’s super fancy, and there is, like stuff, fancy stuff, so I would really like to. My dream is to go on a cruise; so, if it was unsinkable then it is like the best kind of cruise in the world. I would love that.</td>
<td>EE</td>
</tr>
<tr>
<td>4.</td>
<td>Student 1</td>
<td>Yeah, I think it is kind of hard to say what you would have done if you did not know it was going to sink. Cause you always have that knowledge, even though you’re supposed to say what you would have wanted to do if I would not have known if it was built strong enough, but I think if you really, if someone gave you that chance you would say, “oh, it is going to be awesome!” but now that you know what happened, it is just kind of, like, hard to tell.</td>
<td>EE</td>
</tr>
<tr>
<td>5.</td>
<td>Student 4</td>
<td>I would not have wanted to go on it. It seems unsafe to me, like, three of the steam thingies, I don’t remember the name, three of them were real and one of them was fake, so, that would just be a lot of extra weight, so, if something bad was going to occur, like, a storm or something, it could have easily been a disaster even without that iceberg.</td>
<td>EE</td>
</tr>
<tr>
<td>6.</td>
<td>Student 1</td>
<td>Yeah... Even... I would have wanted to go, but at the same time I have, like, a grudge cause I would still feel kind of unsafe being on the water for a week without, like, land being close by.</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Student 3</td>
<td>(5) do you have anything to say?</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Student 5</td>
<td>I... Even though it would sound fun with all that stuff on it, like, all those restaurants or something on it, um, I don’t like boats, so, I would not go on it.</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Student 3</td>
<td>What about you? (Turns to (2))</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Student 2</td>
<td>I have gone on a Disney Cruise before, and I know when we get on I do get a little scared about sinking. I don’t know why, but it goes through my mind, like, the sinking stuff, but, um, I don’t know if I would go on the <em>Titanic</em> cause um, maybe... Maybe...</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Student 5</td>
<td>You could also get lost because there is a ton of people there.</td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Student 2</td>
<td>Yeah, but one thing that my... When we were on the Disney Cruise a person said, like, um, if they get lost there is nowhere else they could because they could really only be on the boat.</td>
<td>ET</td>
</tr>
<tr>
<td>13.</td>
<td>Student 3</td>
<td>Yeah.</td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>Student 1</td>
<td>There is nowhere else to go.</td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>Student 3</td>
<td>You can’t just run off and say, ‘I’m just going to go swim in the ocean now.”</td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>Student 1</td>
<td>Yeah, but there is some...</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>Student 3</td>
<td>If there is a pool on the cruise, why would you want to go swim in the ocean?</td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>Student 4</td>
<td>To see the fish!!</td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td>Student 2</td>
<td>Yeah, there are stinkrays and stuff.</td>
<td></td>
</tr>
<tr>
<td>20.</td>
<td>Student 3</td>
<td>Stinkrays?</td>
<td></td>
</tr>
<tr>
<td>21.</td>
<td>Student 2</td>
<td>Yeah, there are Stingrays that you can touch and stuff.</td>
<td></td>
</tr>
<tr>
<td>22.</td>
<td>Teacher</td>
<td>Let's stay on topic guys.</td>
<td></td>
</tr>
<tr>
<td>23.</td>
<td>Student 5</td>
<td>I have a question. Do you think the <em>Titanic</em> would be remembered if it did not wreck?</td>
<td></td>
</tr>
<tr>
<td>24.</td>
<td>All</td>
<td>Yes...Yeah...Yep</td>
<td></td>
</tr>
<tr>
<td>25.</td>
<td>Student 3</td>
<td>Yeah, because it's, like, I have said multiple times, it's called the unsinkable, so, a huge boat made a long time ago I don't know when...</td>
<td></td>
</tr>
<tr>
<td>26.</td>
<td>Student 5</td>
<td>1912</td>
<td></td>
</tr>
<tr>
<td>27.</td>
<td>Student 3</td>
<td>...Yeah, 1912. Back then they did not have too good of technology, so, if they got, like, a huge ginormous boat I think it would be remembered even if it did not sink.</td>
<td></td>
</tr>
<tr>
<td>28.</td>
<td>Student 5</td>
<td>I don't think it would be remembered because most famous things are remembered because they were wrecked in some way.</td>
<td></td>
</tr>
<tr>
<td>29.</td>
<td>Student 1</td>
<td>I think...</td>
<td></td>
</tr>
<tr>
<td>30.</td>
<td>Teacher</td>
<td>Let's let (s) finish.</td>
<td></td>
</tr>
<tr>
<td>31.</td>
<td>Student 5</td>
<td>Like the <em>Hindenburg</em>. It was like a giant bus thing and it blew up.</td>
<td></td>
</tr>
<tr>
<td>32.</td>
<td>Student 3</td>
<td>And the <em>Edmond Fitzgerald</em>.</td>
<td></td>
</tr>
<tr>
<td>33.</td>
<td>Student 1</td>
<td>I think it would still be remembered, just, in a different way. I think the other ones are remembered more because something different happened to it, but it would be remembered as one of those great ships. Kind of like, just thinking like, Walt Disney World. Nothing bad happened to it, and everyone loves it because it is so big.</td>
<td></td>
</tr>
<tr>
<td>34.</td>
<td>Student 2</td>
<td>And I was going to say, the person who built it, how do you think they felt when they heard that the <em>Titanic</em> sunk?</td>
<td></td>
</tr>
<tr>
<td>35.</td>
<td>Student 1</td>
<td>I think that they would feel very, very, very, bad, like, I...</td>
<td></td>
</tr>
<tr>
<td>36.</td>
<td>Student 3</td>
<td>Especially when you are hearing that more then 1,000 people died because you built it wrong.</td>
<td></td>
</tr>
<tr>
<td>37.</td>
<td>Student 1</td>
<td>Well, I don't think you can really go blame it on the person who built it. There's so many, a lot of conducting things where people just kind of blame it on one person which they shouldn't because there are so many people in this, like, the person who was steering should have saw the iceberg and should have turned ahead or, like, should have seen it before then. The person who built it should have had to make it, like, better radar.</td>
<td></td>
</tr>
<tr>
<td>38.</td>
<td>Student 3</td>
<td>And, um, this huge, ginormous boat could not be built by just one person. Way more people should have worked on it, so, they can't just blame it on one person.</td>
<td></td>
</tr>
<tr>
<td>39.</td>
<td>Student 1</td>
<td>They all could have built something wrong. And, the person who decided, &quot;oh, it's so amazing! Let's not have enough lifeboats for everyone.&quot;</td>
<td></td>
</tr>
</tbody>
</table>