

Incorporating Students' Voices in the Accommodations Debate: A Discourse Analysis of Students' Interactions with Traditional and Multisemiotic Test Items

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Presentation Overview

- ONPAR description
- Research design
- Student interview data
 - Traditional item
 - ONPAR item
- Implications

ONPAR: Access-based framework

- Modifications such as using “plain language, plain formatting, reduced reading load, [and] visuals” (Carr, Kopriva & Rex, 2007: 8)



What will happen to the water level?

Estimate

The graphic shows three identical beakers on a light purple background. Each beaker contains a certain amount of blue water. Above each beaker is a celestial body: the first has a grey sphere (Moon), the second has a grey sphere (Moon), and the third has a brown sphere (Earth). A dashed horizontal line across each beaker indicates the current water level. To the left of each dashed line is a vertical double-headed arrow with a question mark, indicating the task is to estimate the change in water level.

Navigation bar: Question: 3 of 11

Graphic: conveys primary semantic information of item

Text prompt: contains task demand in simple English

Speaker button: provides text prompt read aloud or translated (optional)

Green Help button: demonstrates action needed to complete task (optional)

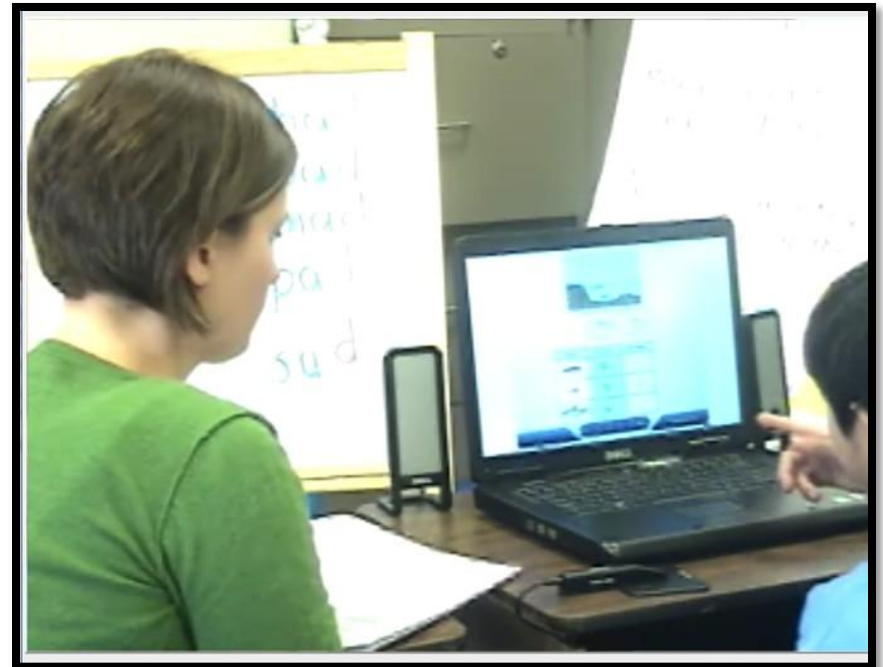
Navigation bar: allows students to navigate the assessment at their own pace and replay animations as desired

Cognitive Interviews

- Problem-solving and reasoning, problematic aspects of test items, bias and content issues, sources of DIF (Kopriva, 2008; Paulsen & Levin, 1999)

ONPAR format

- Semi-retrospective interview
- Translation in Spanish, if requested
- 45-60 minute duration
- Video taped and observation notes taken



Research Question

- What *trouble sources* do traditional items present vs. ONPAR items?

Participants

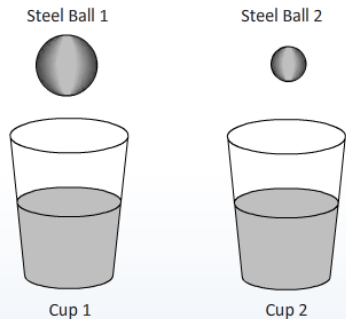
Student Pseudonym	Interview Language	Item
Isabel	English	Traditional
Maria	Spanish	Traditional
Pepe	Spanish/ English	Traditional
Jose	English	Traditional
Cecelia	English	ONPAR
Luisa	English	ONPAR
Ines	English	ONPAR
Beatriz	Spanish	ONPAR

Analysis

- Discourse analysis of student interview data
- Interviews coded for interactional trouble
 - Repair
 - Clarification
 - Contingent queries
- Trouble considered an indicator of difficulty with speaking, hearing or understanding
- Comparison of apparent interactional breakdowns with traditional vs. ONPAR test item
 - Buoyancy traditional (released NAEP item)
 - Buoyancy ONPAR

Traditional item

As shown in the picture below, Christina has two identical cups that are filled to the same level with water. She also has two solid steel balls.



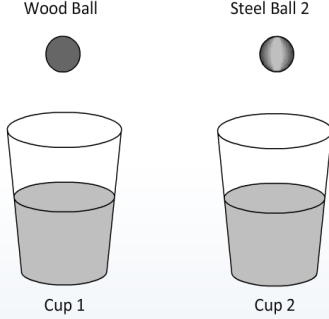
Christina puts ball 1 in cup 1 and ball 2 in cup 2. In which cup will the water level rise the most?

Cup 1

Cup 2

Tell why you think so:

Christina has another ball that is the same size as ball 2, but this ball is made of wood and is hollow.



If she put this hollow ball in one of the cups, do you think the water level would rise more or less than it would if ball 2 were put in the cup?

More

Less

Tell why you think so:

Released 4th grade NAEP science item, 2005

Item rating: Part 1 easy/ Part 2 hard

62% of students answered part 1 correctly; 60% of students answered part 2 incorrectly

Correct: Student response states that the water level goes up more in Cup 1 and gives a correct explanation.

Partially correct: Student response states that the water level goes up more in Cup 1, but no explanation or an incomplete explanation is provided.

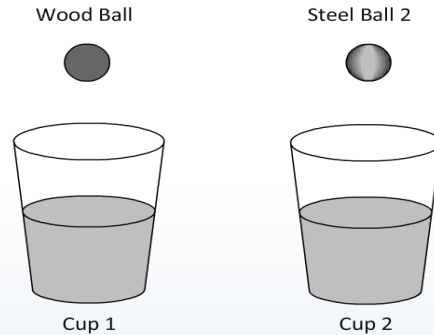
Unsatisfactory/Incorrect: Student response states that the water level goes up more in Cup 2, or that Ball 2 pushes the water level higher in Cup 2.

<http://nces.ed.gov/nationsreportcard/itmrlsx/detail.aspx?subject=science>

Difficulties with Traditional Item

- Three common trouble sources for ELs with traditional items
 - Comprehension of key vocabulary (hollow, rise)
 - Comprehension of task demand; sentence and discourse level aspects (subjunctive, compound noun, reference)
 - Production of answer

Christina has another ball that is the same size as ball 2, but this ball is made of wood and is hollow.



If she put this hollow ball in one of the cups, do you think the water level would rise more or less than it would if ball 2 were put in the cup?

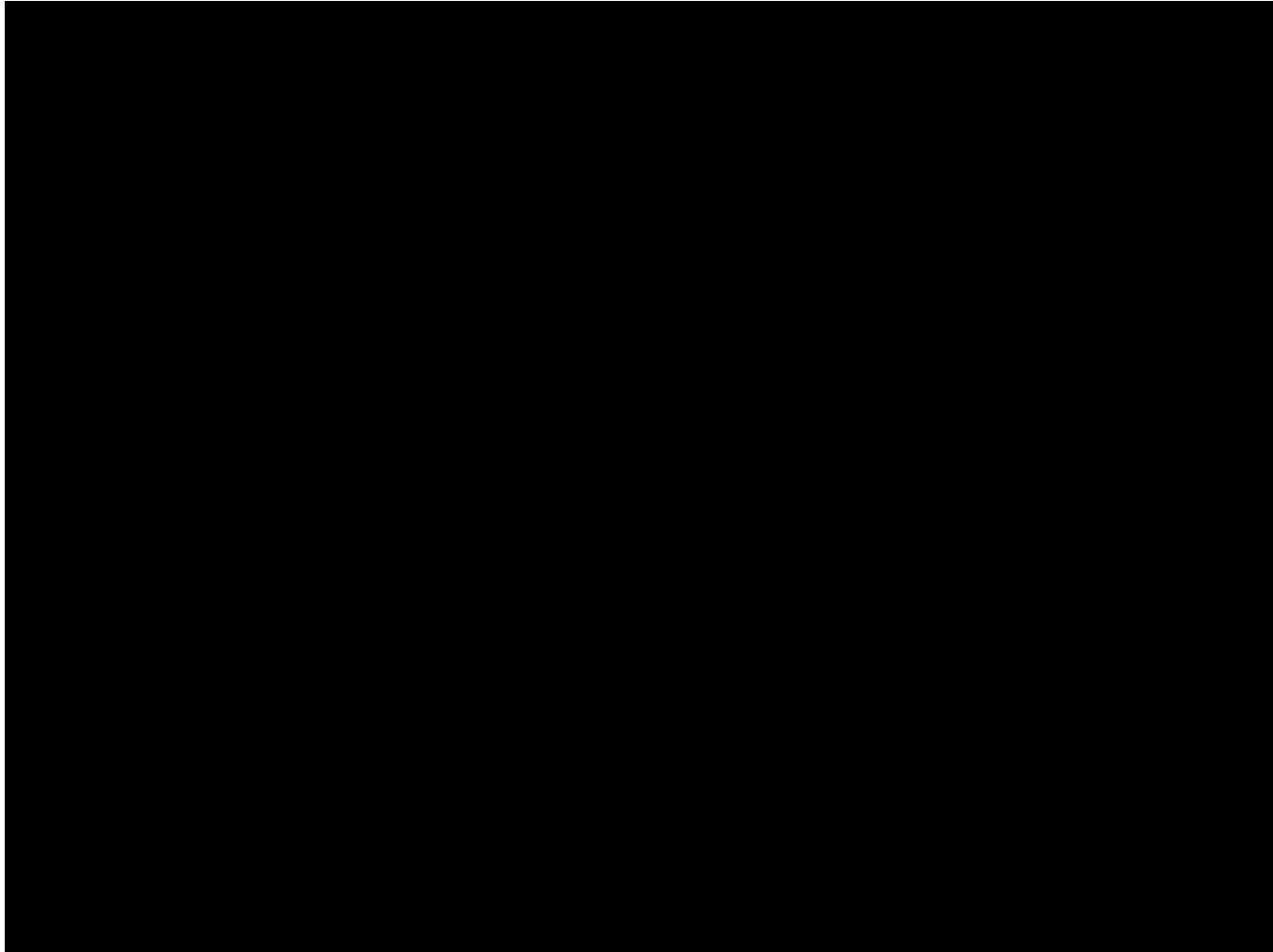
- More
- Less

Tell why you think so:

Pepe's answer, 4th grade, beginning EL

Pepe darkens the "More" option and writes:

"becaues one of the ball it made of wod and the other one it made of steel so if I put tha wood ball in the but it well have the same rise of water"



Pepe: Traditional Item

Interviewer: Can you read this one for me?

Pepe: Christina has another ball that is the same size as ball two, but this ball is made of wood .. and is **hol** (hollow). if she put this **hol** (hollow) .. ball in .. one of the cups, do you think the water level will **riza** (rise) more or less than it would if the ball two were put in the cup?

Interviewer: So what's happening now? What does Christina have?

Pepe: A ball, that is made of wood and the other one is made of steel.

Interviewer: Okay, and are they different size or the same size?

Pepe: The same.

Interviewer: Okay, and then she has two cups. Is one cup bigger than the other?

Pepe: (silence)

Interviewer: Same- same cups? Okay, so what is the question?

Pepe: (silence) Do you think the water level will .. **riz** (rise) more or less than it will if ball two were put in the cup.

Interviewer: What do you think that means?

Pepe: **If they put .. the ball--the both balls together** .. on the same (points to screen) ... on the cup. To see if it will have more water than the other one. Or the same, or less.

Interviewer: Very good, and what do you think your answer is?

Pepe: (silence) .. **more?**

Pepe: Explanation of answer

- Interviewer:** Okay, so, (reading Pepe's answer) *because- because the ball is made of wood and the other is made of steel. So if I put the wood ball it will have the same amount of water will rise? Or more? ...* So your answer is telling me that it's because of the material that it's made out of? But what about the material?
- Pepe:** The wood does not it will stay- it doesn't not have **pressure**.
- Interviewer:** Okay.
- Pepe:** **And if you put the wood ball in the water, it will stay floating.**
- Interviewer:** Oh, okay, the wood will stay floating. How about the steel ball?
- Pepe:** **It will go down and the water will go up.**

Difficulties with ONPAR item

- Common trouble sources
 - Indeterminacy of visuals
 - 3 of 4 students had difficulty with the interpretation of some aspect of the visuals
 - Objects break in half in water

ONPAR Buoyancy

ONPAR: Assessment for English Language Learners - Windows Internet Explorer
http://onpar.us/assessmentTasks/sampleTasks/buoyancy/buoyancy.html

Close Window

What will happen to the balls?

Estimate

Question: 1 of 1

Done Internet 100%

ONPAR: Assessment for English Language Learners - Windows Internet Explorer
http://onpar.us/assessmentTasks/sampleTasks/buoyancy/buoyancy.html

Close Window

What will happen to the balls?

Estimate

Question: 1 of 1

Done Internet 100%

Ines: ONPAR

Interviewer: OK. Did you see (points toward the screen) those little things pop up when you went over the over the balls? Can you do that again for me?

Ines: Yeah. (scrolls over one of the ball icons)

Interviewer: OK, actually go (points at one location on the screen) ahead and look at (points at another location on the screen) all three of them and tell me if you see anything or if that tells you anything.

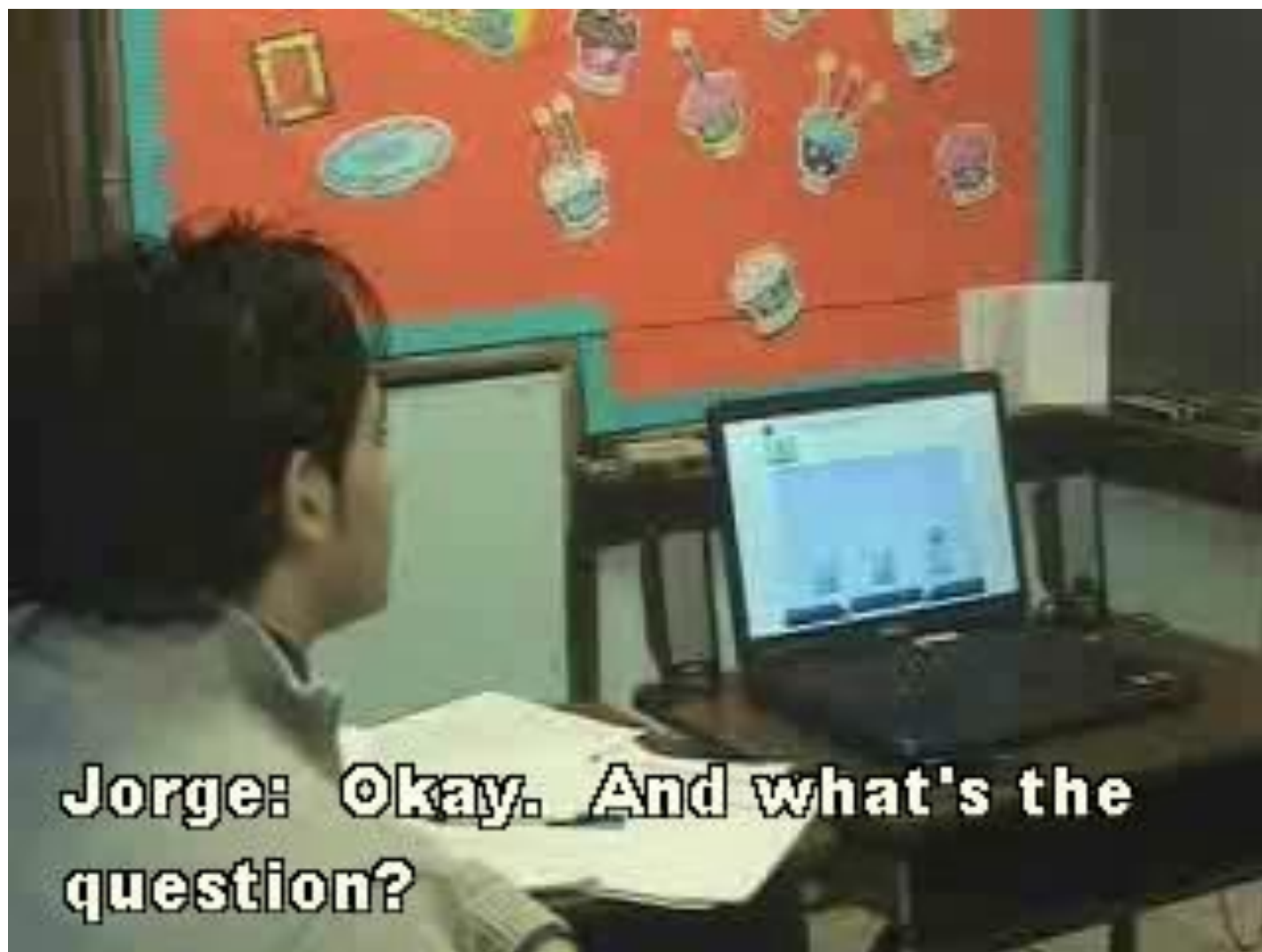
Ines: That they're going to break in half.

Interviewer: OK, why do you think that?

Ines: Because they're (points toward the screen) in half.

Interviewer: OK, and WHEN do you think they're going to break in half?

Ines: Um...(2). If he stays too long in the..water.



Jorge: Okay. And what's the question?

Cecelia: ONPAR

Interviewer: Okay, and what's the question?
Cecelia: "What will happen to the water level?"
Interviewer: And what's it asking you, in your own words?
Cecelia: Will the water will go down..or up.
Interviewer: Very good. You want to try to answer the question?
Cecelia: Um (uses the mouse and adjusts the water levels for 7 seconds) Like that. Stay the same.
Interviewer: That one will stay the same line?
Cecelia: The water's not that heavy.
Interviewer: Right, and the other--ones, one went up high and one went up...higher. I mean, (points at the screen) it went up, but it didn't go up as high. And w--why did you answer that?
Cecelia: Um, this-one is little, so it goes a little up.
Interviewer: Um-hum.
Cecelia: And this one's bigger, and it goes a lot higher.

Student did not use language in an academic way in her explanation, but it is clear that she partly understands the construct and is able to demonstrate understanding with the ONPAR interface.

Discussion

- Cognitive interviewing and discourse analysis provides insight into potentially difficult aspects of items.
- ELs struggle with the *language* of traditional items, which is construct irrelevant.
- ONPAR's multisemiotic features provide multiple routes of access and function in complementary ways.
- ELs misinterpreted some visual aspects of ONPAR.
- Indeterminacy of visuals needs to be addressed in a systematic, thoughtful way:
 - Grammar of visual design (Kress & van Leeuwen, 2001)
 - Intercultural understandings of visuals
 - Complementary roles of modalities (visuals and language)

ONPAR investigates how to demonstrate the validity of dynamic, interactive, computer-based math & science assessment items.

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Thank you

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ONPAR

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