

To Act or Not to Act: That is the Attribution

Purpose

Bertrand and Marsh (“B&M”) (2015)¹ observed that educators attribute student data to factors both within and outside their control. The purpose of this activity is to help teachers reflect on how they make sense of data. It might feel a bit heady. To simplify, imagine you are looking at a data point. It could be a single student’s exit ticket; or Fountas and Pinnell reading level; it could be state assessment data disaggregated by race; or a high school physics test. Imagine that this data is disappointing in some way. To what do you attribute that data? To your teaching? To the test? To your student(s)? To organizational factors? A little bit of this, a little bit of that? Use the framework developed by B&M (modified here) to help you answer these types of questions.

Proponents of attribution theory (used by B&M) suggest that motivation to act, “persistence in a task, and intensity in tackling a task (Dweck & Leggett, 1988); Nicholls, 1984” (B&M, 2015, p. 865) are dependent on the following three characteristics of attribution: locus of causality, stability, and controllability. To simplify, the manner in which an individual makes sense of an outcome influences how they react to that outcome. As explained in the newsletter, attributions matter. Table 1 describes each of the three characteristics of attributions in a school setting.

[Use this link](#) to access a video explaining how to work through the activity.

¹ Bertrand, M., & Marsh, J. A. (2015). Teachers' sensemaking of data and implications for equity. *American Educational Research Journal*, 52(5), 861-893. <https://doi.org/10.3102/0002831215599251>



Table 1*Three Characteristics of Teacher Attributions*

Attribution	Designation	Teacher Belief	Examples (from B&M 2015)
<p><u>Locus of causality (LC)</u></p> <p>Who is responsible for student data – Teacher (T) or not T?</p>	Internal	T believes instruction causes student outcomes.	Ms. Castañeda: “What ... [one class] had a hard time [with] was actually taking the story and analyzing it ..., and I think that was because I maybe didn’t get them specific examples. With my other group, I went into more detail. ... So maybe that’s ... why my student did, one group did better than the other” (p. 875).
	External	T does not believe instruction causes student outcomes.	Mr. Johnson: “[On the benchmark] there was stuff for the kids ... that was hard reading. For me, personally, how they ask the questions, the words they used to ask questions, tend to be difficult. So I use that as kind of test-taking skills rather than standards” (p. 876).
<p><u>Stability (S)</u></p> <p>Can students improve, or are outcomes fixed based on external factors?</p>	Instability	Outcomes can change.	Ms. Castañeda suggests that her pedagogy changed from one class to the next, impacting student outcomes.
	Stability	Outcomes are fixed due to external factors.	Ms. Hightower: “It’s not surprising because I have some low boys in there, and I have some resource kids [students in special education]. So these two resource kids are below basic. I have some low kids in there, even the fact that there is only four below basic is good” (p. 879).
<p><u>Controllability (C)</u></p> <p>Does T have the perceived agency to change student outcomes?</p>	Controllability	T believes that self-imposed pedagogical changes can impact student outcomes.	Ms. Castañeda: “[The other teachers and I] just talked about what we were going to do for the following week ... and how we’re going to help them with analyzing the story” (p. 876)
	Uncontrollability	T believes that outcomes are outside of their control regardless of what pedagogical changes they might make.	Mr. Schneider: “I know she has kids that ... came in a little bit higher than mine, and it’s always fun for my kids to try to get as close to them as they can. They get blown out every time, but it’s still fun to try to get there” (p. 879).



B&M identify “Four Mental Models of Sensemaking”— categories that teachers fall into when analyzing student data. These four models can be found Table 2. Categories are defined by how teachers attribute student data. Table 1 and Table 2 are provided to help you reflect on how you analyze student data. I recommend you read through the entire resource before starting Part 1.

Table 2

The Four Mental Models of Sensemaking

	Model 1	Model 2	Model 3	Model 4
Attribution to . . .	Instruction	Student Understanding	Nature of Test	Student Characteristics
Locus of causality	Internal	External	Internal or external ^a	External
Stability	Instability	Instability	Stability or instability ^a	Stability
Controllability	Controllability	Controllability	Controllability or uncontrollability ^a	Uncontrollability

^aDepends on whether the teacher has a role in test creation.

Note. This table was published with permission from Melanie Bertrand and Julie Marsh. Model 3 teachers can show both *stability* and *instability* and *controllability* and *uncontrollability* when viewing student data. This depended on the teacher’s role (or lack thereof) in test creation. If a teacher assisted in assessment design, they were more likely to believe that (a) outcomes could be changed (*instability*) and (b) they had the agency to support that change (*controllability*).



Part 1A: Scenario Practice, Option 1

Directions: Imagine you are a researcher replicating Bertrand and Marsh’s study. You are observing a group of teachers analyzing student data. Use attribution theory to predict how they might respond to that data. How would a teacher demonstrating an *internal locus of causality* respond to example(s) provided below? Feel free to complete whichever example resonates most with you. The first is from a third grade classroom, the second from a sixth grade classroom.

Example 1: A third grade teacher is conducting running records with their students. They find that Janie’s reading level has stayed the same over the last two months. Use Table 3 to describe how a teacher might make sense of Janie’s lack of progress (as observed using Fountas and Pinnel reading levels).

Table 3

<i>Attribution</i>	<i>Designation</i>	<i>Teacher Belief</i>	<i>What would the conversation sound like? How might the teacher(s) respond to the data from Example 1.</i>	<i>What action(s) might a teacher make or not make based on this attribution?</i>
<u>Locus of causality</u> Who is responsible for student data – Teacher (T) or not T?	Internal	T believes instruction causes student outcomes.		
	External	T does not believe instruction causes student outcomes.		
<u>Stability</u> Can students improve, or are outcomes fixed based on external factors?	Stability	Outcomes are fixed due to external factors.		
	Instability	Outcomes can change.		



<p><u>Controllability</u></p> <p>Does T have the perceived agency to change student outcomes?</p>	Controllability	T believes that self-imposed pedagogical changes can impact student outcomes.		
	Uncontrollability	T believes that outcomes are outside of their control regardless of what pedagogical changes they might make.		



Part 1B: Scenario Practice, Option 2

Example 2: A sixth grade math grade teacher teaches a lesson on using tables to identify equivalent fractions. They administer an exit ticket at the end of class. Hector's response is shown below. Use Table 4 the exit ticket to show how a teacher might make sense of Hector's work.

Original Exit Ticket		
Ratio = 3:5	Ratio = 1:4	Ratio = 2:3
3:5		
		8:12
	4:16	

Hector's Exit Ticket		
Ratio = 3:5	Ratio = 1:4	Ratio = 2:3
3:5	2:6 (I)	4:8 (I)
6:10 (C)	3:8 (I)	8:12
9:15 (C)	4:16	12:18 (C)

Correct Answers		
Ratio = 3:5	Ratio = 1:4	Ratio = 2:3
3:5	2:8	4:6
6:10	3:12	8:12
9:15	4:16	12:18

Table 4

Attribution	Designation	Teacher Belief	What would the conversation sound like? How might the teacher(s) respond to the data from Example 2.	What action(s) might a teacher make or not make based on this attribution?
<u>Locus of causality</u> Who is responsible for student data – Teacher (T) or not T?	Internal	T believes instruction causes student outcomes.		
	External	T does not believe instruction causes student outcomes.		
<u>Stability</u> Can students improve, or are	Stability	Outcomes are fixed due to external factors.		



<p>outcomes fixed based on external factors?</p>	<p>Instability</p>	<p>Outcomes can change.</p>		
<p><u>Controllability</u> Does T have the perceived agency to change student outcomes?</p>	<p>Controllability</p>	<p>T believes that self-imposed pedagogical changes can impact student outcomes.</p>		
	<p>Uncontrollability</p>	<p>T believes that outcomes are outside of their control regardless of what pedagogical changes they might make.</p>		



Part 2: Data Analysis

Directions: Find a recent piece of student data that you can use for this activity. Examples include a unit assessment, exit ticket, or culture survey. It can be a data point from a single student or aggregated data from a larger population (Ex. ELL, SPED, Black students). Use that data to complete Table 5. If you're looking to begin to address issues of inequity, you might select disaggregated data from a historically marginalized population. If you find the activity valuable, you might try it twice—once for an individual student and once for a larger population.

Table 5

<i>What is the data point?</i>		Ex. Fountas and Pinnell reading score. Math unit assessment. Culture survey. Exit ticket. (delete this and insert your response)		
<i>What <u>information</u> does the data provide?</i>		Ex. The student is reading at a Level K and has not grown in two months. The student missed three ratio problems on the exit ticket. (delete this and insert your response)		
<i>Attribution</i>	<i>Designation</i>	<i>Teacher Belief</i>	<i>What would the conversation sound like? How might the teacher(s) respond to the data from Example 1.</i>	<i>What action(s) might a teacher make or not make based on this attribution?</i>
<u>Locus of causality</u> Who is responsible for student data – Teacher (T) or not T?	Internal	T believes instruction causes student outcomes.		
	External	T does not believe instruction causes student outcomes.		
<u>Stability</u> Can students improve, or are outcomes fixed	Stability	Outcomes are fixed due to external factors.		



based on external factors?	Instability	Outcomes can change.		
<i>Controllability</i> Does T have the perceived agency to change student outcomes?	Controllability	T believes that self-imposed pedagogical changes can impact student outcomes.		
	Uncontrollability	T believes that outcomes are outside of their control regardless of what pedagogical changes they might make.		
<i>To what do <u>you</u> attribute this student data?</i>	Locus of causality			
	Stability			
	Controllability			



Part 3: Reflection

Directions: B&M show how teachers interact with ELL and SPED data. Complete Table 6. Consider how you approach data from historically marginalized populations. What might you do to modify or transform your pedagogical approach to these students?

Table 6

<p><i>Which model do you generally fall into? Does your data use practice show characteristics of multiple models?</i></p>	<p>(insert response here)</p>
<p><i>How does this model/approach to attribution influence your motivation to act when observing student data? Do you feel compelled to modify your practice? To reteach content? Do you think that pedagogical changes will not impact student outcomes?</i></p>	
<p><i>Is there a model that you aspire to? If yes, what can you do to move toward it? What can you do to disrupt some habits or routines that might inhibit a desired change?</i></p>	
<p><i>What support(s) do you need to make a change (if a change is desired)? Who can help you do this?</i></p>	
<p><i>Finally, this article and the activities above are useful for both classroom teachers as well as school and district leaders. If you are a classroom teacher and want to change practices at the organizational level (school or district), how could you use this model to advocate for new routines and data use practices?</i></p>	



Version 2

Purpose

Bertrand and Marsh (“B&M”) (2015)² observed that educators attribute student data to factors both within and outside their control. The purpose of this activity is to explore the concept of attribution and help teachers reflect on how they make sense of data. It might feel a bit heady. To simplify, imagine you are looking at a data point. It could be an individual student’s exit ticket; or Fountas and Pinnell reading level; it could be state assessment data disaggregated by race; or a high school science test. Imagine that this data is disappointing in some way. To what do you attribute that data? To your teaching? To the test? To your student(s)? To organizational factors? A little bit of this, a little bit of that? Use the framework developed by B&M (modified here) to help you answer these types of questions. We recommend you read through the entire resource before working through one of the exercises.

Proponents of attribution theory (used by B&M) suggest that motivation to act, “persistence in a task, and intensity in tackling a task (Dweck & Leggett, 1988); Nicholls, 1984” (B&M, 2015, p. 865) are dependent on the following three characteristics of attribution: locus of causality, stability, and controllability. The manner in which an individual makes sense of an outcome influences how they react to that outcome. As explained in the newsletter, attributions matter. Table 1 describes each of the three characteristics of attributions in a school setting.

² Bertrand, M., & Marsh, J. A. (2015). Teachers' sensemaking of data and implications for equity. *American Educational Research Journal*, 52(5), 861-893. <https://doi.org/10.3102/0002831215599251>



Table 1*Three Characteristics of Teacher Attributions*

Attribution	Designation	Teacher Belief	Description
<u>Locus of causality</u>	Internal	Teacher (T) believes instruction causes student outcomes.	Who is responsible for student data – T or not T? If T believes their instruction can impact observed student data, locus of causality is <u>Internal</u> . If T does not believe their instructional decisions contribute to student outcomes, locus of causality is <u>External</u> .
	External	T does not believe instruction causes student outcomes.	
<u>Stability</u>	Instability	Outcomes can change.	Can students improve, or are outcomes fixed? If T believes observed student data can improve, you have <u>Instability</u> . If outcomes for the observed data (not all forms of student data ³) are fixed, you have <u>Stability</u> .
	Stability	Outcomes are fixed due to external factors.	
<u>Controllability</u>	Controllability	T believes that self-imposed pedagogical changes can impact student outcomes.	Does T have the perceived agency to change student outcomes? If T believes their actions can influence student outcomes, you have <u>Controllability</u> . If T believes that outcomes are outside of their control regardless of what pedagogical changes they might make, or if T believes that they lack the agency to change instruction (often due to organizational constraints), you have <u>Uncontrollability</u> .
	Uncontrollability	T believes that outcomes are outside of their control regardless of what pedagogical changes they might make.	

³ This is important because attribution is fluid...



B&M use the three characteristics of attributions to identify “Four Mental Models of Sensemaking”— categories that teachers fall into when analyzing student data. These four models can be found in Table 2 (published and modified with permission from the authors). Categories are defined by how teachers attribute student data.

Table 2

Model	Attribution Characteristics		Attribution To...	Attribution Meaning	Example
1	LC	Internal	Instruction	“Classroom instruction influences student learning, which is reflected in the data” (p. 874).	Ms. Castañeda: “What ... [one class] had a hard time [with] was actually taking the story and analyzing it ..., and I think that was because I maybe didn’t get them specific examples. With my other group, I went into more detail. ... So maybe that’s ... why my student did, one group did better than the other. [...] [The other teachers and I] just talked about what we were going to do for the following week ... and how we’re going to help them with analyzing the story” (pp. 875-876)” (p. 875).
	S	Instability			
	C	Controllability			
2	LC	External	Student Understanding ⁴	“Student understanding affects outcomes” (p. 876)	Mr. Johnson: “[On the benchmark] there was stuff for the kids ... that was hard reading. For me, personally, how they ask the questions, the words they used to ask questions, tend to be difficult. So I use that as kind of test-taking skills rather than standards” (p. 876).
	S	Instability			
	C	Controllability			
3	LC	Internal or External	Nature of the Test	“The nature of the test affects student outcomes” (p. 877).	“There was a question that 100 percent of the students got right, every single one. We looked at it . . . and we asked ourselves, “How was that useful? If everybody got it right, was it a good question? I mean, could we have done, how can [we] tweak it so it would be more useful and more information could be derived from it? Was it framed in . . . such a way that it was too easy?” (p. 877).
	S	Stability or Instability ⁵			
	C	Controllability or uncontrollability ⁶			
4	LC	External	Student Characteristics	“Students in this group have inherent abilities and attributes, which affect their learning and outcomes” (p. 878)	Ms. Hightower: “It’s not surprising because I have some low boys in there, and I have some resource kids [students in special education]. So these two resource kids are below basic. I have some low kids in there, even the fact that there is only four below basic is good” (p. 879).
	S	Stability			
	C	Uncontrollability			

⁴ Student understanding and nature of the test can be similar...They differ in that...

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Part 1A: Scenario Practice, Option 1

Directions: Imagine you are a researcher replicating Bertrand and Marsh’s study. You are observing a group of teachers analyzing student data. Use attribution theory to predict how a teacher in each model might respond to that data. Feel free to complete whichever example resonates most with you. You can also do both. The first is from a third grade classroom, the second from a sixth grade classroom.

Example 1: A third grade teacher is conducting running records with their students. They find that Janie’s reading level has stayed the same over the last two months. Use Table 3 to describe how a teacher might make sense of Janie’s lack of progress (as observed using Fountas and Pinnel reading levels).

Table 3

<i>Model</i>	<i>Attribution Characteristics</i>		<i>Attribution To...</i>	<i>What would the conversation sound like? How might the teacher(s) respond to the data from Example 1. Be as specific as possible.</i>	<i>What action(s) might this teacher take based on the way they make sense of this data?</i>
1	LC	Internal	Instruction		
	S	Instability			
	C	Controllability			
2	LC	External	Student Understanding		
	S	Instability			
	C	Controllability			
3	LC	Internal or External	Nature of the Test		
	S	Stability or Instability			
	C	Controllability or uncontrollability			
4	LC	External	Student		



	S	Stability	Characteristics		
	C	Uncontrollability			



Part 1B: Scenario Practice, Option 2

Example 2: A sixth grade math grade teacher teaches a lesson on using tables to identify equivalent fractions. They administer an exit ticket at the end of class. Hector's response is shown below. Use Table 4 the exit ticket to show how a teacher might make sense of Hector's work.

Original Exit Ticket		
Ratio = 3:5	Ratio = 1:4	Ratio = 2:3
3:5		
		8:12
	4:16	

Hector's Exit Ticket		
Ratio = 3:5	Ratio = 1:4	Ratio = 2:3
3:5	2:6 (I)	4:8 (I)
6:10 (C)	3:8 (I)	8:12
9:15 (C)	4:16	12:18 (C)

Correct Answers		
Ratio = 3:5	Ratio = 1:4	Ratio = 2:3
3:5	2:8	4:6
6:10	3:12	8:12
9:15	4:16	12:18

Table 4

Model	Attribution Characteristics		Attribution To...	What would the conversation sound like? How might the teacher(s) respond to the data from Example 1. Be as specific as possible.	What action(s) might they take based on the way they make sense of this data?
1	LC	Internal	Instruction		
	S	Instability			
	C	Controllability			
2	LC	External	Student Understanding		
	S	Instability			
	C	Controllability			
3	LC	Internal or External	Nature of the Test		
	S	Stability or Instability			



	C	Controllability or uncontrollability			
4	LC	External	Student Characteristics		
	S	Stability			
	C	Uncontrollability			



Part 2: Data Analysis

Directions: Find a recent piece of student data that you can use for this activity. Examples include a unit assessment, exit ticket, or culture survey. It can be a data point from a single student or aggregated data from a larger population (Ex. ELL, SPED, Black students). Use that data to complete Table 5. If you're looking to begin to address issues of inequity, you might select disaggregated data from a historically marginalized population. If you find the activity valuable, you might try it twice—once for an individual student and once for a larger population.

Table 5

<i>What is the data point?</i>		Ex. Fountas and Pinnell reading score. Math unit assessment. Culture survey. Exit ticket. (delete this and insert your response)			
<i>What <u>information</u> does the data provide?</i>		Ex. The student is reading at a Level K and has not grown in two months. The student missed three ratio problems on the exit ticket. (delete this and insert your response)			
<i>Model</i>	<i>Attribution Characteristics</i>		<i>Attribution To...</i>	<i>How might a teacher in each model respond to <u>your</u> data? Be as specific as possible.</i>	<i>What action(s) might they take based on the way they make sense of this data?</i>
1	LC	Internal	Instruction		
	S	Instability			
	C	Controllability			
2	LC	External	Student Understanding		
	S	Instability			
	C	Controllability			
3	LC	Internal or External	Nature of the Test		
	S	Stability or Instability			
	C	Controllability or			



		uncontrollability		
4	LC	External	Student Characteristics	
	S	Stability		
	C	Uncontrollability		



Part 3: Reflection

Directions: B&M show how teachers interact with ELL and SPED data. Complete Table 6. Consider how you approach data from historically marginalized populations. What might you do to modify or transform your pedagogical approach to these students?

Table 6

<p><i>To what do <u>you</u> attribute this student data? Identify the three attribution characteristics that align with the analysis of your data. Explain why you made those choices.</i></p>	<p><i>Locus of Causality:</i> <i>Stability:</i> <i>Controllability:</i> <i>Explanation:</i></p>
<p><i>Which model do you fall into? Does your data use practice show characteristics of multiple models?</i></p>	<p>(insert response here)</p>
<p><i>How does the model you fall into influence your motivation to act? Do you feel compelled to modify your practice? To reteach content? Do you think that pedagogical changes will not impact student outcomes?</i></p>	
<p><i>Is there a model that you aspire to? If yes, what can you do to move toward it? What can you do to disrupt some habits or routines that might inhibit a desired change?</i></p>	
<p><i>What support(s) do you need to make a change (if a change is desired)? Who can help you do this?</i></p>	



Finally, this article and the activities above are useful for both classroom teachers as well as school and district leaders. If you are a classroom teacher and want to change practices at the organizational level (school or district), how could you use this model to advocate for new routines and data use practices?

