'Let Me Learn' or 'Just the Answer'?
Research Consultations and Dweck's Theories of Intelligence

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Introduction

Reference interactions, particularly research consultations, are informal teaching and learning opportunities, in which librarians not only help students to locate the information they need but also strive to help students improve their information literacy skills.[1] However, we've probably all noticed that some students are invested in the research process, whereas others are primarily interested in the end result (i.e. getting a good grade). Psychologist Carol S. Dweck identified the entity and incremental theories of intelligence,[2] also referred to as the fixed and growth mindsets,[3] which could affect how students navigate the research process—including whether they will seek help from a librarian and what they intend to take away from that interaction. These mindsets, combined with their connection to mastery- and performance-oriented responses to challenging activities, can help us to better understand the intrinsic motivations of students seeking assistance. The performance-oriented student could be focused on finding the "right" information and might not realize that the skills, attitudes, and habits of mind used to conduct research in one course could be applied to a variety of academic and personal information-seeking situations. The mastery-oriented student, while desiring to do well in the class, could be more interested in developing the skills and practices needed to seek information in a variety of contexts.

Few studies attempt to understand students seeking reference assistance beyond categorizing their questions and assessing overall satisfaction with the experience. While these findings are important, they do not reveal, in general, students' intrinsic motivations for seeking assistance and their expectations for that assistance. In addition, Devin Savage notes the inattention given to the research consultation in the literature.[4] Using Savage's (2015) definition of research consultations, this study intends to address these gaps by exploring whether students who made research consultation appointments with librarians at an undergraduate-serving regional campus of a Mid-Atlantic research university exhibited a particular mindset identified by Dweck, as well as examining their goal orientations. We hope the findings will serve as evidence to inform and potentially even transform reference practice and informal information literacy instruction.

Literature Review
Mindsets

Those who have a fixed mindset are also referred to as "entity theorists." A fundamental characteristic of a fixed

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mindset is the belief that intelligence is static and is not changeable. These individuals are typically focused on performance and reluctant to reveal when they are struggling. Those with a fixed mindset fear that asking questions may make them appear less intelligent and that the exertion of effort is an indictment of their innate intelligence. On the other hand, individuals with a growth mindset, known as "incremental theorists," believe intelligence is a dynamic quality; therefore, they believe it is possible to increase one's intelligence as they learn. Incremental theorists are less interested in others' opinions of their acumen and more concerned about learning and improving. Therefore, effort and failure are not an indictment of intelligence, but an opportunity to learn and grow. For this reason, growth mindset-oriented individuals approach difficult or challenging tasks with a mastery orientation. As may be evident, primary to the differences between individuals who exhibit growth or fixed mindsets is how they confront a challenging situation in which they could potentially fail.

Researchers have found evidence of a connection between mindsets and students' willingness to face challenges or ask for help, which also informs their goal orientations. David Scott Yeager and Dweck reviewed research on mindsets and found that students' abilities to face challenges are related to the mindset traits they've adopted, writing "if students can be redirected to see intellectual ability as something that can be developed over time with effort, good strategies, and help from others, then they are more resilient when they encounter the rigorous learning opportunities presented to them."[5] One factor contributing to a need for redirection is a reluctance to seek help because of low self-esteem or feelings of inadequacy, which may carry over from childhood or adolescence.[6] Seeking help typically involves sharing details of a perceived weakness with others, which is a behavior that individuals with fixed mindsets generally avoid. They tend to be insecure about revealing areas of weakness or struggle because doing so may go against the identity the fixed mindset has given them, such as smart, skilled, or high-performing. They strive to preserve this identity because they believe it results in receiving love and respect from other people.[7]

While much of the research on mindsets has focused on K-12 students, there have been studies that examine mindsets and their implications within the higher education context. In their work with college students, Richard Robins and Jennifer Pals found that those with a fixed mindset reported a tendency to give up when faced with a challenge. By giving up, they did not experience opportunities to persist and overcome challenges. Not surprisingly, their self-esteem was generally lower than that of their growth mindset-oriented peers, and this gap widened over the course of four years of college.[8] These students continued to have insecurities about seeking help, resulting in repetition of the same behaviors.

Mindsets are not the only influence on or indicator of students' academic behavior. Environmental factors are also involved. The value students place on their school, assignments or classes can affect their goal orientation. Caroline Dupeyrat and Claudette Mariné found that even when students display traits of a growth mindset, they may also value their grades or have aspirations depending on them, such as graduate school. In these cases, their priorities may weigh in favor of a high GPA, rather than learning and exploring a concept.[9]

Eissa Al-Ansari also observed how variables outside of mindsets contributed to college students' priorities. "...task value plays an important role for some students, helping them with some levels of self-regulation (metacognitive and effort management). Students can be skilled in cognitive and self-regulating strategies, but motivational beliefs can influence the way these strategies are used for different tasks."[10] This is similar to what we informally observe on our campuses: classes that do not weigh heavily on graduation or future plans may get less attention from those with a growth mindset, even if they believe they could learn and even succeed in these courses. They will instead focus their efforts on courses they consider important to their majors or careers.

Based on the literature, we have seen how mindsets play important roles in shaping students' academic behavior. Angela Duckworth notes that in her own research with Dweck, they found that high-school seniors

with a growth mindset were "significantly grittier than students with a fixed mindset...more likely to enroll in and persist through college."[11] As academic librarians, we work with students who may not have the level of "grit" explained by Duckworth. What is our role in helping them build upon—or even develop—this persistence?

Intersection of Mindsets and Research Consultations

While the authors of the present study do not privilege one type of mindset over the other, the reality of higher education is that academic culture tends to favor the growth mindset and encourages students to develop the traits that would be associated with this mindset. Our own profession's new *Framework for Information Literacy for Higher Education* shows a similar preference, encouraging us to foster inquiry in our students, encouraging them to learn for learning's sake.[12] Indeed, several of the dispositions that address the affective or attitudinal nature of the threshold concepts indicate that students developing their information literacy skills understand and perhaps embraces the iterative, challenging, and sometimes frustrating nature of doing research. Dweck herself, however, cautions that we should not get caught up in an all-consuming quest to achieve growth mindedness, and that even the most growth-oriented person might still have a fixed mindset when it comes to certain things. She writes:

> ...nobody has a growth mindset in everything all the time. Everyone is a mixture of fixed and growth mindsets. You could have a predominant growth mindset in an area but there can still be things that trigger you into a fixed mindset trait. Something really challenging and outside your comfort zone can trigger it, or, if you encounter someone who is much better than you at something you pride yourself on, you can think "Oh, that person has ability, not me." So I think we all, students and adults, have to look for our fixed-mindset triggers and understand when we are falling into that mindset.[13]

It is precisely in these challenging zones, areas where students may falter regardless of their default predominant mindset, that librarians can intervene, giving the extra support needed at a crucial point in the student's learning. In a time where it seems that standardized testing is emphasized and critical thinking forced to take a backseat in secondary education, students entering the world of higher education with its inherent challenges may need more help to push through those challenges and identify strategies they can use to succeed in their coursework. Supporting this higher level of thinking dovetails nicely with efforts to utilize the *Framework* to help students along their journey toward information literacy and illustrates perfectly why consideration of student mindsets should be of interest to academic librarians.

One-on-one reference interactions, and especially the in-depth interactions that take place during research consultations, are a perfect forum for this type of support. Perhaps the students who need this interaction most of all are those least likely to seek it out: students who subscribe to a predominantly fixed mindset, who may believe that because their intelligence is a fixed quantity, might believe that seeking out help—from librarians or anyone else—wouldn't do anything to improve their grades or their understanding of their coursework. Angela Duckworth states that "with a fixed mindset, you're likely to interpret these setbacks as evidence that, after all... you're not good enough. With a growth mindset, you believe you can learn to do better".[14] By emphasizing what exactly we can do to help them through challenges they may be facing in their coursework, librarians become an important ally in overcoming barriers that students subscribing to a predominantly fixed mindset may not have the grit to break through on their own.

Method

After receiving approval from the university's Institutional Review Board, the authors asked students who made appointments for research consultations if they would be willing to take a brief survey before beginning the consultation. The survey, which was created in Qualtrics, took about three to five minutes to complete. In addition to a few demographic questions, the survey included five statements related to mindsets and four statements related to goal orientation (see Table 1), which were taken or adapted from Dweck's previous research.[15] Because of this, information related to the reliability and validity of these statements can be found in previously published literature.[16] For each of these statements, participants were asked to respond with either strongly agree, agree, disagree, or strongly disagree. With the exception of age, demographic questions were placed at the end of the survey to avoid inducing stereotype threat. Almost all of these questions asked students to choose from pre-selected options except for gender; gender was left open-ended so participants could respond in a way that they felt best fit them.

TABLE 1 Survey Statements
Mindsets
You have a certain amount of intelligence, and you can't really do much to change it
You can always substantially change how intelligent you are.
You can learn new things, but you can't really change your basic intelligence.
No matter how much intelligence you have, you can always change it quite a bit.
You can change your basic intelligence level considerably.
Goal Orientation
It's much more important for me to learn things in my classes than it is to get the best grades.
Although I hate to admit it, I sometimes would rather do well in a class than learn a lot.
If I knew I wasn't going to do well at a task, I probably wouldn't do it even if I might learn a lot from it.
If I had to choose between getting a good grade and being challenged in class, I would choose… • getting a good grade. • being challenged in class.

Participants

Participants in this study were students enrolled at an undergraduate-serving regional campus of a Mid-Atlantic research university who made an appointment with a librarian for a research consultation between September 2015 and December 2016. Participation in the study was both voluntary and anonymous, and participants who were interested in participating took the survey immediately before the research consultation began. One hundred and three students participated in the survey, which is roughly an 84% participation rate. Two responses were removed from the sample prior to data analysis. One participant was not 18 years of age or older and another indicated that they had taken the survey before. Thus the sample size used for data analysis was 101.

Table 2 provides most of the participants' demographic information. The majority of the participants were female, and seniors comprised the largest percentage of the participants (42%). The top three majors for participants were communication (34%), biological science (18%), and psychology (14%). The majority of the partici-

pants were required to make an appointment for their course. For the overwhelming majority of the participants (90%), this was their first research consultation appointment with a librarian. Interestingly, no participants reported hearing about research consultations from friends or classmates; they majority heard about this service from their professors or from librarians (presumably during instruction sessions).

			TABLE 2 Participants' Demographic Information (N = 101)	
			Required to make appointment?	*n (%)*
			Yes	60 (59.4%)
Class standing	*n (%)*		No	41 (40.6%)
Freshman	26 (25.7%)			
Sophomore	18 (17.8%)		*First consultation appointment?*	
Junior	15 (14.9%)		Yes	90 (89.1%)
Senior	42 (41.6%)		No	11 (10.9%)
Gender			*How did you hear about consultations?*	
Female	62 (61.4%)		Professor	20 (19.8%)
Male	27 (26.7%)		Friend or classmate	0 (0.0%)
No answer	12 (11.9%)		Librarian	32 (31.7%)
			Other	3 (3.0%)

Limitations

Before reporting the results of the study, it is important to acknowledge that these results are only representative of the present study's sample. While it is possible to use the results to think about our practice or reflect on our own experiences, we cannot make inferences about the entire population of students who make appointments for research consultations.

Results[17]

Table 3 reports the distribution of the mindsets among the participants. Because the majority of the participants were required to make an appointment with a librarian for a research consultation, we further analyzed the data to determine if this distinction was important for this sample. The mean mindset score for all three groups—total sample, participants required to make an appointment, and participants not required to make an appointment— was 2.78, which indicates that the majority of the sample subscribes to a growth mindset. Although the mean score was the same, there was some variation between the required and not required participants. The proportion of growth mindset participants in the required group was 10 percentage points higher than that of the not required group. A t-test determined that this difference is not statistically significant, perhaps due to the small sample sizes or the fact that the proportion of strong growth and strong fixed mindset participants is similar for both groups.

Table 4 reports the goal orientation—mastery or performance—of the participants. The majority of participants, including both required and not required participants, identified with a performance orientation. There was a slight variation in the mean scores between required and not required participants, though a t-test determined that this difference is also not statistically significant. Just as with the mindsets, the proportion of strong mastery and strong performance oriented students is similar between required and not required participants.

TABLE 3 Distribution of the Mindsets			
	All participants (N=101)	**Required (N=60)**	**Not required (N=41)**
Mindset	**n (%)**	**n (%)**	**n (%)**
Growth	75 (74.3%)	47 (78.3%)	28 (68.3%)
Neutral	0 (0.0%)	0 (0.0%)	0 (0.0%)
Fixed	26 (25.7%)	13 (21.7%)	13 (31.7%)
Strong growth	47 (46.5%)	29 (48.3%)	18 (43.9%)
Strong fixed	11 (10.9%)	7 (11.6%)	4 (9.8%)
Mean score	2.78	2.78	2.78

Note: Fixed mindset participants had a mean score below 2.5. Growth mindset participants had a mean score above 2.5. Neutral participants had a mean score that equaled 2.5. Strong fixed mindset participants had a mean score equal to or below 2, and strong growth mindset participants had a mean score equal to or above 3.

TABLE 4 Participants' Goal Orientation			
	All participants (N=101)	**Required (N=60)**	**Not required (N=41)**
Theory	**n (%)**	**n (%)**	**n (%)**
Mastery	29 (28.7%)	17 (28.3%)	12 (29.3%)
Neutral	10 (9.9%)	5 (8.3%)	5 (12.2%)
Performance	62 (61.4%)	38 (63.3%)	24 (58.5%)
Strong mastery	24 (23.8%)	14 (23.3%)	10 (24.4%)
Strong performance	43 (42.6%)	24 (40.0%)	19 (43.9%)
Mean score	2.41	2.38	2.44

Note: Performance oriented students had a mean score below 2.5. Mastery oriented students had a mean score above 2.5. Neutral participants had a mean score that equaled 2.5. Strong performance oriented students had a mean score equal to or below 2, and strong mastery oriented students had a mean score equal to or above 3.

One interesting finding related to mindsets is that participants seemed to respond more strongly to statements that represented a growth mindset perspective. For the statements "You can always substantially change how intelligent you are" and "No matter how much intelligence you have, you can always change it quite a bit," 77% and 80% of participants agreed or strongly agreed with these statements. Their level of disagreement with fixed mindset statements was slightly lower. For the statements "You have a certain amount of intelligence, and you can't really do much to change it" and You can learn new things, but you can't really change your basic intelligence," 63% and 61% of participants disagreed or strongly disagreed with these statements. The same difference was not observed for the goal orientation statements.

Discussion

Upon an initial glance, it would seem that the findings of this study are somewhat contradictory. Since a majority of the participants (75%) identified with a growth mindset, we might expect to see a stronger identification with a mastery orientation. However, this was not the case. A majority of the participants (61%) identified with a performance orientation, which is usually linked to a fixed mindset. However, other studies have provided evidence that students who identified with a growth mindset did not necessarily reject a performance orientation, even though there was an association between the identification with a fixed mindset and a performance orientation.[18] In reviewing previous research, Dupeyrat and Mariné found that, in general, the evidence supporting a connection between mindsets and goal orientation was weak.

Dupeyrat and Mariné's findings provide an additional contextual layer for the findings of the present study. They found an association between mastery orientation and active cognitive engagement, meaning that mastery oriented students were more likely to use deep processing strategies which require more effort on the part of the student. Interestingly, in their reseach, students' cognitive engagement strategy—either deep or shallow processing—was not significantly associated with achievement. Dupeyrat and Mariné offer two potential explanations that are relevant to the development of information literacy and related higher-order thinking skills. One explanation is that "deep-processing strategies do not have a strong influence on immediate performance outcomes, rather they facilitate long-term retention of the material that has been learned."[19] Another is that assessments of learning might actually require students to use shallow processing strategies, such as memorizing facts, rather than assessing for deep understanding of the material. If the latter is true, students are likely successful (i.e. get good grades) using shallow processing strategies. However, research assignments and the processes of locating, evaluating, selecting, and using sources in an academic context tend to favor deep processing strategies, in which faculty expect students to expend more effort.

Research assignments tend to require more effort because they tend to involve ill-structured problems,[20] and expert researchers are developing these assignments for novice researchers.[21] Anne M. Fields describes ill-structured problems as "problems with indefinite starting points, multiple and arguable solutions, and unclear maps for finding one's way through information."[22] In addition, the fact that students don't have the same information about the discipline, both in terms of vocabulary, methodologies, appropriate sources types, and writing conventions as the faculty who are developing these assignments adds an additional layer of challenge. We've likely all met with a student who was frustrated, because they've spoken to their professor several times and they are still unsure of what is expected of them or what they are doing "wrong." The challenge for the librarian then becomes finding the time in a consultation to not only cover the performance aspects of the assignments, such as finding some good sources or writing a few citations, but also to encourage students to use deep processing strategies which might not feel familiar.

In a recent interview,[23] Dweck notes that many teachers have been using blanket praise-the-effort feedback as a way to try to develop the growth mindset. This is ineffective, especially for students who are not doing well, because it feels like empty praise. Instead, Dweck argues that teachers should focus on both strategy and effort. She says, "Students need to know that if they're stuck, they don't just need effort. You don't want them redoubling their efforts with the same ineffective strategies." This probably seems like an obvious statement to librarians, who spend a lot of time talking about search strategies. However, we argue there are some ways to intentionally help students develop more of a growth mindset or mastery orientation through research consultations.

We do not propose a new theory or pedagogy for how to engage students in thinking about strategy during research consultations, but rather would like to highlight existing approaches to teaching through reference work that are relevant to mindsets and goal orientation. Both James K. Elmborg and Fields have written about

the social nature of knowledge construction.[24] Elmborg specifically highlights social constructivism, which he notes is the "dominant learning theory in writing studies."[25] Social constructivism is related to the novice/expert research dichotomy mentioned above, as it "emphasizes the social negotiation of meaning in specific discourse communities."[26] Elmborg argues that in order to be effective teachers in reference interaction, librarians must not speak to students as if they have the same level of domain expertise. Rather, it's important to recognize them as learners and meet them where they are with the vocabulary they know.

For many of us, it can be easy in a research consultation to simply direct students to try a particular search tool or recommend particular keywords. What is harder, especially when time is an issue or if the student has a strong performance orientation, is to talk about why we are recommending particular tools, keywords, or strategies. Elmborg highlights Donald Graves'[27] five types of questions to "help students move intellectually through the challenge of thinking through a problem,"[28] and Fields proposes that librarians use scaffolded questions and talking though the process out loud during a reference interaction to get the student to think about strategy.[29] Before diving into trying a strategy, talk about what the student has already done, including what worked and didn't work. Spend some time talking about the student's topic and helping them to identify different aspects of the topic that they might want to explore. If you are going to try different search tools or different keywords, share with them why you think that these might work. If you've had an opportunity to prepare for the consultation ahead of time, be open and honest about difficulties you encountered when preparing in order to highlight the iterative nature of searching for information in academic contexts. Have the student brainstorm a few additional strategies to try on their own after the consultation. You can also address the challenges of using peer-reviewed articles by talking about why the professor wants the students to use these, who writes these articles and for whom they are written, the strategy you personally use for reading peer-reviewed articles, and what you recommend doing if a student is having difficulty understanding an article. These kinds of conversations, especially ones that include your own experiences, struggles, and strategies, can help to normalize the challenge of doing research assignments in college, as well as helping students to develop strategies that they can use in the future.

Conclusion

The adoption of the new *Framework for Information Literacy for Higher Education* indicates that the profession's conception of information literacy has transformed, which means the way we view our interactions with students should also transform. In the new *Framework*, many of the dispositions and knowledge practices associated with the six threshold concepts seem to privilege mastery-oriented responses associated with the growth mindset. However, a mastery-oriented response to research might not be a natural approach for some students. These dispositions and practices should prompt academic librarians to consider methods for helping students develop not only concrete skills, but also ways of thinking and acting, when using information. This will require that we better understand and identify students' self-beliefs and intrinsic motivations for seeking help, including mindsets and goal orientation. We can then create, share, and discuss thoughtful and flexible informal teaching strategies for these interactions.

Notes

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7. Dweck, *Self-Theories*, 218.

8. Richard W. Robins and Jennifer L. Pals, "Implicit Self-Theories in the Academic Domain: Implications for Goal Orientation, Attributions, Affect, and Self-Esteem Change." *Self & Identity 1*, no. 4 (October 2002): 313–336.

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11. Angela Duckworth, *Grit: The Power of Passion and Perseverance*, (New York: Scribner, 2016), 318.

12. *Framework for Information Literacy for Higher Education* (Chicago: Association of College & Research Libraries, 2015).

13. Christine Gross-Loh, "How Praise Became a Consolation Prize," *The Atlantic*, December 16, 2016, accessed December 28, 2016, https://www.theatlantic.com/education/archive/2016/12/how-praise-became-a-consolation-prize/510845/.

14. Duckworth, *Grit: The Power of Passion and Perseverance*, 317.

15. Dweck, *Self-Theories*, 22, 178.

16. Carol S. Dweck, Chi-yue Chiu, and Ying-yi Hong, "Implicit Theories and Their Role in Judgments and Reactions: A Word from Two Perspectives," *Psychological Inquiry 6*, no. 4 (1995); Sheri R. Levy, Steven J. Stroessner, and Carol S. Dweck, "Stereotype Formation and Endorsement: The Role of Implicit Theories," *Journal of Personality and Social Psychology 74*, no. 6 (1998)

17. The analysis conducted for the present study is similar to the analysis conducted in previously reported studies. See Amanda L. Folk, "Academic Reference and Instruction Librarians and Dweck's Theories of Intelligence," *College & Research Libraries 77*, no. 3 (2016) and Amanda L. Folk, Kelly Bradish, and Anna Mary Williford, "Research Consultations and Dweck's Theories of Intelligence (presentation at the 22nd Annual Reference Research Forum, American Library Association Annual Conference, Orlando, Florida, June 2016).

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19. Dupeyrat and Mariné, "Implicit Theories of Intelligence," 55.

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23. Gross-Loh, "How Praise Became a Consolation Prize."

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25. Elmborg, "Teaching at the Desk," 458.

26. Ibid., 457.

27. Donald Graves, *Writing: Teachers and Children at Work* (Exeter, NH: Heinemann, 1994).

28. Elmborg, "Teaching at the Desk," 460.

29. Fields, "Ill-Structured Problems."