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## Subjective Negative Feeling and Students' Learning

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### Abstract

This study examined the relationship between the subjective negative feeling states that undergraduate students felt about a research methods course and of their course performance. A total of 106 undergraduates were surveyed about their subjective feeling states at both the beginning and the end of the term. These feeling variables were correlated with their course performance variables (exam scores, research paper scores, and final course grades). The results found that the more reduction in subjective negative feelings students had, the better they performed in the course. This study also examined what aspects of the research methods course that students felt negative about. This research contributes to the scholarship of teaching and learning by highlighting the importance of students' feeling state and how it might influence students' learning in college-level courses. This research also expands the current knowledge in this relationship by examining what aspects students felt negative about a particular course, which might guide us on how to teach it in the future.

**Keywords:** Emotion, learning, subjective feeling, course performances, research methods.



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## Introduction

As an instructor, I see many different kinds of feelings in my classrooms. Seeing these different feeling states made me wonder how subjective feelings, especially negative ones, students have about the course might impact their learning in the classroom.

Previous studies have shown that negative feeling states impede cognition. For example, anxiety tends to reduce working memory capacity (Ashcraft & Kirk, 2001). Within a highly studied phenomenon of test anxiety, some studies have shown that test anxiety impedes students' optimal performance in courses (see Hembree, 1988 for review). The negative influence of anxiety on learning might be due to the attentional differences; highly anxious people tend to divide their attention between self and task (divided attention), whereas less-anxious people tend to focus solely on the task (focused attention) (see Wine, 1971 for review). Studies have also shown that the treatments to reduce text anxiety facilitated better course performance (see Hembree, 1988 for review). Physically, studies focused on stress hormone, cortisol, have found that cortisol could impair memory and learning (see Roozendaal, McEwen, & Chatterji, 2009 for review). Studies have also shown that stress impairs memory recall (Bahrick, Parker, Fivush, & Levitt, 1998; Kuhlmann, Piel, & Wolf, 2005; Merritt, Orstein, & Spicker, 1994; Payne, Nadel, Allen, Thomas, & Jacobs, 2002). Others state that stress also prevents people from learning (see Perry, 2006 for review).

Previous studies have also shown that fear prevents people from taking initiatives, which is a crucial part of learning. For example, fear prevented affluent high school students to take social responsibility (Seider, 2008) and fear prevented faculty to modify their teaching strategies (Hodges, 2006). Studies have also shown that the prefrontal cortex, which is a region of the brain that is critical for higher-order cognitive functions, such as executive functions, learning, and decision making, has been shown to be impaired by chronic fear (see Arnsten, 2009 for review).

One of the courses that trigger students' negative feeling states is a research methods course. Studies have shown that students often perceive research methods courses to be difficult, challenging, and novel, which triggers negative feelings, such as being stressed and anxious (Papanastasiou & Zembylas, 2008). Some researchers have called this specific anxiety as "research methods anxiety" (Papanastasiou & Zembylas, 2008). For example, Papanastasiou and Zembylas (2008) studied research methods anxiety in undergraduate students and found anxiety levels were related to their perception of course difficulty (the more difficult that students perceived the course to be, the more anxiety they felt) and relevance to their future careers (the more relevant that students perceived the research to be for their future career, the more anxiety they felt). Interestingly, in this study, the results also found that the more anxious students felt, the better grades they achieved in the course (Papanastasiou & Zembylas, 2008).

Using students in a research methods course as participants, this study tested two research questions about negative subjective feeling states and learning. The first research question was to test how students felt about the research methods course at the beginning of the term might be related to their course performance. This study also examined what aspects of the course students felt negative about. Based on previous studies of negative feeling state and learning, the hypothesis of the current study was that there would be negative correlations between the subjective negative feeling students felt at the beginning of the term and their course performance – the more negative feelings students felt about

the research methods course at the beginning of the term, the worse the students would perform in the course.

The second research question focused on how the reduction in negative feeling state throughout the term of the class might be related to their course performance. Based on the previous studies on text anxiety and the intervention, there would be a positive correlation between the reduction of negative feelings and their course performance – the more reduction in how negative students felt throughout the term, the better they would perform in the course.

This study expanded the previous studies on negative feeling state by including fear and worry as negative feeling states rather than focusing on anxiety as previously studied. The current study also expanded by adding information on what aspects of the research methods course made students feel more scared and worried.

## **Methodology**

106 undergraduate students who were enrolled in a Research Methods course participated in this study. All of them majored in Child Development and either junior or senior standing. Three (2.8%) were males and 103 (97.2%) were females, which is typical for the major. The race/ethnicity of the participants is shown in Table 1, which mirrors the diverse student body of the university.

Surveys were created in order to see the perception of student's current knowledge, the effectiveness of teaching strategies (at the end of the term only), and how students felt about the research methods course or conducting research. For the current study, two questions related to subjective feelings about conducting research were used for the purposes of analysis. Two feelings – fear, and worry/stress – were posed utilizing a 10-point, Likert-type scale, with "0" representing "not at all" and "10" representing "very much." At the beginning of the term, the survey questions were targeted to the research methods course to which the students were enrolled ("How fearful are you about this class?" "How worried/stressed are you about this class?") in order to capture their general feeling towards the research methods course. At the end of the term, the survey questions were targeted on their future research ("How fearful/worried are you about conducting more research in the future?" "How fearful/worried are you about reading and understanding research articles in the future?"). The students were also asked an open-ended question about what they were most feared and worried about the course ("What do you most fear/worry about this class?").

These survey questions were used in place of the Attitudes Toward Research (ATR) scale (Papanastasiou, 2005). One reason for this approach was that the research questions targeted two feeling states, fear and worry, which have been shown to differ from anxiety that the ATR scale best measures (see Sylvers, Lilienfeld, & LaPrairie, 2011 for review). A second reason was to avoid the influence of specific content questions asked in the ATR scale for the open-ended question, which asks students about what aspects of the research methods course they were most scared/worried.

To measure participants' feelings at the beginning of the term, students enrolled in the course received the survey questions either online or through paper format on the first day of the course. Irrespective of format – online or paper – the survey questions were given to the students prior to any information given about the course (e.g., on the first day, the

students were asked to complete the survey before introducing the course expectations). At the end of the term, the students were asked to complete the end-of-term version of the survey after completing their final exams. The students' course grade, exam scores, and research paper scores were used as an indicator of their course performance.

## Results

At the beginning of the term, the students' ratings on two feeling-related questions ("How fearful are you about this class?" "How worried/stressed are you about this class?") were found to be strongly correlated ( $r = .82$ ). Also, at the end of the term, the students' ratings on two feeling-related questions ("How fearful/worried are you about conducting more research in the future?" "How fearful/worried are you about reading and understanding research articles in the future?") were found to be strongly correlated ( $r = .68$ ). Therefore, these two ratings were averaged in order to create a dependent variable, average negative feeling at the beginning of the term and the end of the term. Also, mid-term exam and final exam scores ( $r = .91$ ), first research paper and final research paper scores ( $r = .77$ ) were found to be highly correlated; therefore, these two scores were averaged so as to create a dependent variable, average exam and average research paper scores for each student.

To test the relationship between the subjective negative feeling variables and course performance variables, the aforementioned variables were entered into Pearson Correlations. As seen in Table 2, there multiple significant relations were found among the feeling variables and course performance variables, which are reviewed in the subsequent Discussion section.

With the open question asking students about what aspects of the research methods course they were most scared/worried, the responses given by the students were then sorted into nine categories (quizzes/tests, the difficulty of course/materials, workload, grades – not passing/getting good grades, time management/work-life balance, research, writing, math/statistics, and group work). Some of the students' responses were sorted into more than two categories (e.g., "What I am most scared and worried about this class would be very difficult and writing papers." This response would be sorted as difficulty of course/materials, and also writing). Table 3 shows the number and percentage of responses sorted into each category.

To test the second research question, the reduction in negative feelings about the research methods course throughout the term was calculated as the score difference between the average negative feeling at the beginning of term and the average negative feeling at the end of term (the average negative feeling at the beginning – the average negative feeling at the end). A larger number indicated greater reduction of negative feeling about the research methods course – meaning feeling less fearful/worried about the course throughout the term. For example, if a student rated "8" at the beginning of the term, then rated "6" at the end of term, the difference – reduction of negative feeling – would be "2"; whereas, if a student rated "8" at the beginning of the term and "2" at the end of the term, the difference – reduction of the negative feeling – would be "6." Table 4 shows the correlations between the reduction in negative feelings and course performance variables, which are also addressed in the following Discussion section.

## Discussion and Conclusion

Two research questions were investigated in this study: The first question was regarding negative feelings (fear and worry) that students felt about a research methods course at the beginning of the term might be related to their course performance, and the second question was how any reduction in negative feeling throughout the term might be related to their course performance.

Regarding the first research question – whether students' negative feelings about the course at the beginning of the term might be related to their course performance, as seen in Table 2, was not found to have any significant relationship. The results did not support the hypothesis, suggesting that students' negative feelings about the course at the beginning of the term did not impede their learning throughout the course. This result contributes to the new insight that fear and worry that students felt in this course initially did not prevent them from taking initiatives (learning) as shown in previous research discussed in the Introduction section. The results also contradict the assumption that anxious and fearful students do not perform well in school. A possible reason for the results might be due to the measurements used in this study, which measured general fear and worry, rather than specific fear and worry or prolonged fear and worry. For example, some studies have found that specific anxiety measures, such as test anxiety measures, predicted better on course performance, whereas general anxiety measures did not predict as well as specific measures (Alpert & Haber, 1960). Another possibility is that the survey questions used in this study did not provide any specific definitions for the feeling states of fear and worry. Therefore, students might be confused about what those terms may have meant (although this is unlikely considering that fear is one of the basic emotions (Izard, 1992).

For the second research question – how the reduction in students' negative feelings throughout the term might relate to their course performance, as seen in Table 3, the greater the reduction in negative feelings felt throughout the term, the better the students performed (specifically, their final course grades and research paper scores). This suggests that students who overcame their negative feelings about the course performed better. Interesting, the reduction in negative feelings was not related to their exam scores, but was significantly related to their overall course grade and research paper scores. This suggests that the reduction in negative feelings might have differential influences on a different domain of assessments. The explanation of the results (differential influences) may require further examination of why and how that might be.

How might the reduction of students' negative feelings be related to their course performance? One possibility might be due to their executive function (EF) skills (e.g., Munakata et al., 2011). Previous studies have shown that overcoming fear might be related to EF skills (e.g., Sotres-Bayon, Cain, & LeDoux, 2006). Better EF skills have also been shown to be related to better academic achievement (e.g., Best, Miller, & Naglieri, 2011). There are two possible relations between the reduction of negative feelings, EF skills, and academic performance. One possibility is that the EF skills mediate the relationship between fear reduction and academic performance – the better EF skills explains the relationship between the reduction and academic performance (the better EF skills influences both the reduction and better academic performance independently; therefore, there is no direct relationship between the reduction and academic performance without the EF skills). The second possibility is that the EF skills moderate the relationship between fear reduction and

academic performance – the relationship between the reduction and academic performance would be different based on the level of EF skills. Future research is needed in order to examine the relationship between the reduction of fear/worry, EF skills, and course performance.

The results from the open-ended question about what aspects of the research methods course the students were most scared/worried about at the beginning of term provides potential insight into how to reduce such negative feelings. The results show what the students were most scared/worried about the course in nine diverse categories. The most common fear/worry about the course was writing (21%). The next most common fear/worry was difficulty of the course/materials (17%) and the course workload (17%). Interestingly, there were fewer students who expressed fear/worry about math or statistics (2%). Many of the students' responses at the beginning of the term were vague or seemingly unrelated to that particular course's content. For example, many students expressed fear/worry about the difficulty of the course and its workload (e.g., "I am scared and worried that this course will be very difficult and time-consuming"), but the description provided in the question could be applied to any course, and therefore not particular to a research methods course. Only 14% of responses ("Research" & "Math/Statistics" categories) were tied to the content of the course in question, with the majority of comments (as seen by categories) being generic and not tied particularly to the content of this course. Even within the responses related to this course, as seen in previous research (Papanastasiou & Zembylas, 2008), students' responses were not specific to which parts of research or math/statistics they were scared or worried about (e.g., "Research scares me" or "I am most scared about the math portion of this course"). These responses suggest that there are potential ways to reduce students' negative feelings towards this course. For example, making assignments manageable (e.g., smaller assignments, such as parts of research papers, that lead to major assignments, such as a final research paper) might help those students who commented on issues with workload, time management, and writing as being the scariest and worrisome part of the course.

The limitations of the current study are that the data were collected from a single research methods course that was taught by one instructor. The data might be different for other courses and thereby may elicit less negative feelings in students, and also might differ if the course was taught by different instructors. Also, other measures, such as previous course grades, and students' EF skills were not collected in this study, which may have influenced the relationships found in this study. Besides, the survey questions were self-reporting, and therefore relied heavily on the students' self-perceptions of their feeling states.

Overall, the current research findings expand on the existing research on learning and feeling by examining the feeling state of students, specifically incorporating fear and worry, in the classroom and how negative feeling states might impede or facilitate their learning. Testing was applied in the classroom which also strengthens and generalizes the relationship between cognition, learning, and feeling states found in the other studies. The current research also contributes to the scholarship of learning and teaching by examining the relationship between students' negative feeling states and their course performances. This study highlights the importance of understanding students' feelings of state and how it might influence the students' course performance and learning. The results highlight the needs for instructors of research methods courses to be mindful of potential negative feeling

blockage, and to consider ways to minimize them for the sake of their students' success on the course.

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## Appendix

**Table 1.** Race/ethnicity distribution of the participants

Race/Ethnicity	<i>n</i>	%
African American	6	5.7%
Asian	12	11.3%
Caucasian	7	6.6%
Hispanic or Latino/Latina	73	68.9%
Middle Eastern or North African	2	1.9%
Native Hawaiian or Other Pacific Islander	1	0.9%
Other	3	2.8%
Missing	2	1.9%
<u>Total</u>	106	

**Table 2.** Correlations between feeling variables and course performance variables

	1	2	3	4	5
1. Negative Feeling at Beginning	—	.20*	-.04	-.03	.02
2. Negative Feeling at End		—	-.39**	-.25*	-.28**
3. Course Grade			—	.53**	.89**
4. Exams				—	.41**
5. Research Papers					—

\*\* Correlation is significant at the .01 level (2-tailed)

\* Correlation is significant at the .05 level (2-tailed)

**Table 3.** Number of responses in each category

Categories	<i>n</i>	%
Writing	28	21%
Difficult Course/Materials	23	17%
Workload	22	17%
Grades	16	12%
Research	14	11%
Time Management/Work-Life Balance	12	9%
Quizzes/Tests	11	8%
Math/Statistics	4	3%
Group Work	2	2%
<u>Total</u>	132	100%

**Table 4.** *Correlation between the reduction of negative feeling and course performance*

	1	2	3	4
1. Negative Feeling Reduction	—	.31**	.19	.26**
2. Course Grade		—	.53**	.89**
3. Exams			—	.41**
4. Research Papers				—

\*\* Correlation is significant at the .01 level (2-tailed)

\* Correlation is significant at the .05 level (2-tailed)