Attachment Representations and Emotions in Teaching

as Antecedents to Teaching Styles in Higher Education

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Abstract

The current study explored how relational antecedents and emotional experiences were associated with faculty-centered versus student-centered approaches to teaching in higher education. One hundred and forty-one faculty members from two institutions of higher education in the United States completed self-report surveys regarding an undergraduate course they were teaching that semester. Path analyses showed that faculty reports of a secure attachment style were positively correlated with positive teaching-related emotions and, in turn, with greater use of a student-centered, inquiry-based approach to teaching emphasizing engagement with course material and restructuring of students' knowledge. Faculty reports of avoidant and anxious-ambivalent attachment styles were correlated with greater negative teaching-related emotions and, in turn, with greater use of a faculty-centered, direct instruction teaching approach. These findings suggest that attachment theory is a useful lens through which to understand why faculty might feel more positively or negatively about their teaching and, in turn, the teaching approaches they employ. We discuss how our findings might inform the re-design of faculty training programs to encourage reflection on relationship styles and greater positive emotions about teaching.

Keywords: higher education, faculty-student relationships, attachment styles, emotions in teaching, direct instruction, inquiry-based teaching approaches

1. Introduction

While matriculation into institutions of higher education is at an all-time high, many students entering college after high school fail to complete their degrees in a timely manner, either dropping out entirely or transferring among multiple institutions, significantly increasing their time to graduation (Irwin et al., 2022). A host of factors have been identified as contributors to failure in higher education, including lack of academic preparation, personal mental health struggles, and lack of financial resources (Mattanah, 2016). However, beyond these societal or individual factors, the most significant predictor of whether students remain in college or not is their ability to feel connected and integrated into the campus community (Astin, 1993; Tinto, 1993). And, among other important individuals supporting students' integration into higher education, faculty play a critical role in helping students feel excited about their learning, integrated into their classes, and ultimately influence students' decision to remain at their chosen institution (Pascarella & Terenzini, 2005). In the current study, we explored two different faculty teaching styles that may facilitate or inhibit the sense in which students feel they are integrated into the classroom and excited about their learning in higher education.

Faculty adopt a range of teaching strategies in higher education, each with different consequences for student learning. Despite heterogeneity in these approaches, teaching strategies generally have been categorized into two approaches: one emphasizing direct instruction and the instructor's control over the structure and content of the course, and another that is more student-centered and focused on inquiry-based learning, student engagement, and encouraging of student input to guide class structure and content (Jiang et al., 2021; Trigwell et al., 1999). Although both strategies have merit,

and faculty may use a combination, inquiry-based approaches have been shown to engage students more deeply in the class material and enhance their long-term mastery of course content as well as foster their development as independent, self-motivated learners (Trigwell et al., 2005; Trigwell, 2012).

Given the merits of inquiry-based, student-centered approaches, researchers have sought to understand the factors that lead faculty to adopt one approach over another. Contextual factors, such as university type (research vs. teaching focused institution), subject matter (natural science vs. humanities courses), class size, and different cultural contexts have been associated with differing teaching strategies (Hagenauer et al., 2023; Zhang et al., 2019). Intrapersonal factors, such as faculty's use of emotion regulation strategies (i.e., cognitive reappraisal, expressive suppression) and the experience of positive teaching-related emotions also have been associated with approaches to teaching, specifically with student-centered teaching strategies (Kordts-Freudinger, 2017; Trigwell, 2012; Zhang et al., 2019). There is a paucity of research, however, on distal intrapersonal factors that might explain *why* faculty are more likely to deploy effective emotion regulation strategies and experience positive or negative emotions in teaching. To that end, in the current study, we used a theoretically-grounded approach to examine whether faculty who experience greater security and trust in their relationships (i.e., attachment security) were more likely to experience positive emotions in their teaching and, in turn, adopt an inquiry-based, student-centered teaching approach.

1.1 Approaches to Teaching and Student Learning Outcomes

As aforementioned, although there are subtle differences within the frameworks and terminologies that characterize different teaching approaches, two overall teaching approaches have emerged. The first is characterized as teacher-focused and utilizes direct forms of instruction, in which the goal of teaching is to transmit knowledge to students, so that information can be absorbed most easily. This framework is based on behavioral assumptions that learning is observable through a change in behavior (Jiang et al., 2021). The second approach is more student-centered and utilizes an inquiry-based approach to learning, in which students are encouraged to actively engage with course material and to question their own assumptions, which can lead to restructuring their knowledge. This approach is based on constructivist learning theories, in which knowledge is gained though "active engagement rather than passive reception" (Jiang et al., 2021, p. 3).

A widely recognized instrument for assessing these teaching approaches is the Approaches to Teaching Inventory (ATI) developed by Keith Trigwell and colleagues (Trigwell et al., 1999; Trigwell, 2004; Trigwell, 2012). Trigwell termed the Information-Transfer/Teacher-Focused (ITTF) approach as one that is faculty-focused with the primary goal of knowledge transmission. With the second teaching approach, described as Conceptual-Change/Student-Focused (CCSF), faculty consider their primary teaching goal as "facilitating student learning or students' knowledge-construction processes" (Trigwell, 2012, p. 608). In this approach, faculty emphasize student input into the structure and content of the class, challenge students' existing understanding of the course content, and encourage the construction of new knowledge.

Prior research with the ATI has found links between faculty's teaching approaches and students' approaches to learning in the classroom. For example, Trigwell (1999) found that the ITTF approach to teaching was associated with a surface approach to learning by students, whereas the CCSF approach was associated with a deep approach. Students who generally favor a deep approach to learning are more highly motivated to continue their studies, to demonstrate greater mastery of course material over time, and to develop into life-long learners (Biggs et al., 2001). In contrast, students who adopt a more surface approach to learning primarily emphasize memorization of course concepts to score well on tests and "move on". These students may do well in the short-term but ultimately show reduced motivation and interest in learning over time (Biggs & Tang, 2011; Gow & Kember, 1990).

1.2 Emotions in Teaching

To better understand why some faculty use an ITTF approach despite research showing that it ultimately might not be optimal for student learning, research has focused on how faculty's emotional experiences inform their approaches to teaching. Positive emotions including joy, satisfaction, pride, excitement and even a kind of non-possessive love have been identified as common experiences for educators, especially when their students are responsive to them and cooperative in the learning process (Chen, 2019; Kordts-Freudinger, 2017; Jiang et al., 2021; Trigwell, 2012). On the other hand, teachers also regularly experience a range of negative emotions, including anger, frustration, anxiety, and sadness, particularly when students misbehave, are inattentive or lazy, and/or when their institution is unresponsive to them or their colleagues are uncooperative (Hagenauer et al., 2016). Although a fine-grained analysis of emotional responses is often desirable when studying emotion, categorizing educators' emotional responses globally as positive or negative has proven to be quite useful when exploring links between emotional experiences and teaching strategies (Zhang et al., 2019).

There are several explanations as to how teaching-related emotions affect the deployment of different teaching strategies. The appraisal model of emotions (Ellsworth & Scherer, 2003) suggests that emotional responses follow cognitive appraisals of situations and mediate individual responses to those situations (Hagenauer, 2016; Jiang et al., 2021). Positive emotions "generate more teaching ideas and strategies" (Sutton & Wheatley, 2003, p. 338; as cited in Trigwell, 2012, p. 610) and are associated with greater intrinsic motivation to complete tasks. As noted by Frenzel et al. (2021), Fredrickson's (2004) broaden-and-build model of positive emotions also may help to explain links between positive emotional experiences and teaching strategies. Specifically, positive emotions may enhance cognitive flexibility, which is needed when adopting a more student-centered approach to teaching in which the experiences in the classroom are inherently more unpredictable (Jiang et al., 2021). Indeed, more satisfying interactions with students have been consistently associated with faculty using student-focused teaching strategies (e.g., CCSF) in a variety of cultural contexts, including Westernized countries such as Canada and Australia (Hagenauer et al., 2016; 2023; Kordts-Freudinger, 2017) and non-Westernized regions of the world such as China (Jiang et al., 2021) and Latin America (Garganté et al., 2014).

On the other hand, negative emotions, such as anger and anxiety, show a more complex relationship with teaching strategies dependent, in part, upon culture. In studies of highly Westernized societies, including Australia, and Canada, negative emotions about teaching are linked with more teacher-focused teaching strategies (e.g., ITTF) (Kordts-Freudinger, 2017: Trigwell, 2013), possibly because educators in these societies are encouraged to display positive emotions when interacting with students. When those interactions are less positive, faculty may resort to limiting displays of their negative emotional experience. By contrast, faculty in less Westernized societies, including Germany [Germany is considered a "moderately" Westernized society, according to Hofstede and Hofstede's (2005) "individualism index", with a score of 67 out of 100], Russia, and China, are more willing to express negative emotions directly to their students (Hagenauer et al., 2016; Kordts-Freudinger, 2017; Mendzheritskaya et al., 2015). Because negative emotional exchanges between students and faculty are more common and less aversive in these societies, this phenomenon may explain why negative emotions are not as clearly linked to teacher-focused teaching strategies in these countries. That is, faculty may feel less of a need to "withdraw" from their students because of such exchanges. Interestingly, no studies to date have explored the relation between positive and negative emotions and teaching approaches in the United States, a highly Westernized society (with a score of 91 out of 100 on Hofstede and Hofstede's (2005) individualism index; https://www.hofstede-insights.com/country-comparison-tool), which is, in part, what motivated the current study.

1.3 Attachment Style, Teaching-Related Emotions, and Teaching Strategies

Attachment security has been related not only to greater facility with regulating one's emotions, but also a greater likelihood of experiencing positive emotions in one's relationships (Park et al., 2022), both of which may facilitate a more student-centered approach to teaching in higher education. A thorough introduction to attachment theory is beyond the scope of this paper (for comprehensive reviews, see Cassidy & Shaver, 2008; Mikulincer & Shaver, 2007). Briefly stated, attachment theory posits that individuals' early relationships with significant caregivers provide a template for expectations regarding relationships with others later in one's life and for managing one's emotions in challenging situations. If early caregivers have been responsive and attentive to one's needs, one develops a secure attachment representation or style, in which the individual expects others to be responsive to one's expressed needs and is able to manage emotional reactions through effective emotion regulatory strategies (Gross, 1999; Mikulincer & Shaver, 2007). If early caregivers have been consistently rejecting, an individual may develop an avoidant attachment style, in which they do not expect others to respond well to them, their needs are unexpressed, strong emotional reactions are avoided or denied, and self-reliance is emphasized highly. Alternatively, if early caregivers have been inconsistently attentive and responsive to one's needs, one may develop an anxious attachment style, in which others are not trusted to give a consistent response. Consequently, emotional reactions are sometimes exaggerated to elicit a response from others and are not well regulated (Cassidy & Shaver, 2008; Mikulincer & Shaver, 2007).

Attachment representations have significant implications for the management and expression of emotions in various interpersonal contexts. Higher education settings, where faculty attachment representations may play an important role in how they manage their emotions while teaching and engaging with their students, are an understudied context. Previous research has shown that faculty who use more adaptive emotion-regulation strategies are able to reappraise challenging situations in a positive light. In turn, these faculty experience more positive emotions when teaching and are more likely to use student-centered teaching approaches (Kordts-Freudinger, 2017). Alternatively, professors who use avoidant emotion regulation strategies, minimizing affective expressions, experience greater negative emotions when teaching and are more likely to use faculty-centered teaching approaches (Kordts-Freudinger, 2017).

1.4 Goals and Hypotheses of the Current Study

Building on this research, we expected that securely attached professors would show more positive emotions when teaching and will be more inclined to use student-centered teaching approaches. Faculty higher in avoidant attachment will likely experience greater negative emotions in teaching and will be more likely to employ faculty-centered teaching approaches. Faculty higher in anxious attachment may experience a range of both positive and negative emotions while teaching, as they seek to establish relationships with others, but may incline towards faculty-centered teaching approaches if they experience more negative emotions while interacting with their students.

The first goal of the current study was to replicate and extend the research on emotional experiences and teaching approaches by focusing explicitly on a US sample. The second goal was to examine faculty members' attachment representations as a possible distal factor associated with their emotional experiences in the classroom and their selection of different teaching strategies. Finally, we examined whether teaching-related emotions might mediate the link between attachment representations and teaching styles. We hypothesized the following:

(1) Faculty in the United States endorsing more positive teaching-related emotions will be more likely to utilize more student-focused teaching styles (i.e., CCSF) whereas faculty endorsing negative teaching-related emotions will be more likely to adopt a teacher-focused approach (i.e., ITTF), given that the US is highly Westernized.

(2) Faculty with more secure attachment representations will report more positive teaching-related emotions. Faculty with more insecure representations of attachment (avoidant or anxious) will report more negative teaching-related emotions. In the case of avoidant attachment, we hypothesized a link between avoidance and a teacher-focused teaching strategy (i.e., ITTF). We did not advance a hypothesis regarding anxious attachment and teaching style, as faculty with this attachment representation may alternate between both teaching strategies.

(3) Emotions in teaching will mediate the relation between attachment representations and teaching styles. Specifically, there will be an indirect effect of secure representations on the student-focused teaching style (CCSF) via positive teaching-related emotions and an indirect effect of insecure representations on the teacher-focused style (ITTF) via negative teaching-related emotions.

2. Method

2.1 Participants

This study included 141 faculty participants from two institutions in the United States. Most participants (n=106, 75%) were faculty from a large state university in the mid-Atlantic region; the remainder (n=35, 25%) were from a small private college in the Northeast region. Most (n=122, 86%) were full-time professors, 15 (11%) were part-time or adjunct faculty, and four (3%) selected other. Across the two universities, 79 (57%) participants identified themselves as women, 57 (41%) as men, two declined to answer the question, and one participant identified as genderqueer. Regarding their highest level of education, 80% reported a doctoral degree, 19% reported a master's degree, and <1% reported a bachelor's degree. The average number of years teaching among the faculty participants was 16.42 (SD = 11.27) years. Faculty reported their disciplines as follows: 47 (33%) social sciences (e.g., Psychology, Sociology, Political Science, etc.), 35 (25%) natural sciences, 31 (22%) humanities, 14 (10%) fine arts, 12 (9%) in an allied health department (e.g., Kinesiology, Health Sciences, Nursing), and 2 (1%) in another department (Legal Studies, etc.).

The average age of the faculty was 42.02 (SD = 11.31) years. Racial identification was reported as 87% White, 7% Asian or Asian American, 3% Black or African American, <1% Latino or Hispanic, <1% Multiracial, <1% Native American, and <1% Other. Regarding relationship status, 121 (86%) reported being married or in a domestic partnership, 11 (8%) reported being single, and 8 (6%) divorced. In terms of household income, 62 (44%) reported an annual household income of $100,000-$200,000, 34 (24%) $50,000-$100,000, 25 (18%) more than $200,000, and 20 (14%) preferred not to disclose.

2.2 Procedures

Participants were selected through purposive sampling. The research team reviewed each department in the academic divisions to identify selected departments with substantial representation of full-time and part-time faculty. Emails were sent to the faculty explaining the study and asking for their participation. Those who agreed to participate were informed they would receive an email later in the semester with the survey link. Faculty who volunteered to participate were assigned a three-digit code when completing their survey and were asked to report on their experience in one particular class during the semester (chosen by the research team).

An anonymous link to the self-report survey was distributed to participants roughly mid-way through the semester. Each participant read and agreed to an informed consent statement. At the first site, participants had the option to enter

a drawing for a $25 Amazon gift card upon completing the survey; at the second site, participants were eligible to receive a small gift card to an on-campus eatery. The drawing was not linked to the survey responses. The Institutional Review Boards at both sites approved the study procedures.

2.3 Measures

2.3.1 Demographics

Participants responded to several basic prompts pertaining to their demographics such as their age, gender orientation, race/ethnicity, marital status, years teaching, highest level of education, and income level.

2.3.2 Attachment Security

The Attachment Style Questionnaire (ASQ; Feeney et al.,1994) assesses an individual's overall attachment style without regard to a specific relationship. This measure was utilized in the current study because we wanted faculty to think about their overall manner of relating to others, rather than focus on a particular relationship (like a romantic partner or parent), which we thought would be most predictive of their way of relating to students. The ASQ is a widely used reliable and valid measure with five subscales: Confidence in Relationships (measuring secure attachment), Relationships as Secondary and Discomfort with Closeness (measuring avoidant attachment), and Preoccupation and Need for Approval (measuring anxious attachment). In this study, we focused on mean scores for secure, avoidant, and anxious attachment, averaging across subscales for each attachment style (after reverse coding negatively worded items). Participants endorsed their responses on a six-point Likert Scale (1=*totally disagree*, 6=*totally agree*). A sample item of secure attachment was "I find it easy to get close to others"; a sample item of anxious attachment was "I worry that others won't care about me as much as I care about them"; and a sample item of avoidant attachment was "Achieving things is more important than building relationships". All three dimensions of attachment were reliable in our sample: Secure Attachment (α=.84), Anxious Attachment (α=.87), and Avoidant Attachment (α=.90).

2.3.3 Emotions in Teaching

The Emotions in Teaching Inventory (ETI; Trigwell, 2012) was utilized to evaluate professors' positive and negative emotions regarding their teaching experiences. The ETI contains 20 items, 10 of which assess positive emotions and 10 negative emotions, rated on a 1-5 Likert scale, from strongly disagree to strongly agree. Positive emotion items focus on pride, motivation, satisfaction, and confidence in teaching (e.g., "I am usually sure that things are going well in the teaching of this course"). Negative emotion items focus on anxiety, frustration, boredom, annoyance, and embarrassment (e.g., "When I get teaching activities wrong in class, I feel embarrassed"). Previous studies have shown that the ETI predicts approaches to teaching (Trigwell, 2012) and teacher stress and job satisfaction (Parveen & Bano, 2019). We combined the 10 positive emotion items and the 10 negative emotion items to create measures of overall positive and negative emotions in this study, which were shown to be reliable: Positive Emotions (α=.85); Negative Emotions (α=.85).

2.3.4 Teaching Strategies

The Approaches to Teaching Inventory (ATI; Trigwell & Prosser, 2004) measures two overarching approaches to teaching in a university setting: (1) Information Transmission/Teacher-Focused (ITTF) and (2) Conceptual Change/Student-Focused (CCSF). Faculty who use the ITTF approach aim to deliver information to students in a clear and structured manner ("I structure this subject to help students pass the formal assessment"), whereas professors who use the CCSF approach aim to have students transform their current knowledge to understand new concepts ("I encourage students to restructure their existing knowledge in terms of the new way of thinking about the subject that they will develop"). The ATI is a 16-item questionnaire with a five-point Likert response scale (1=*this item was only rarely true for me in this subject* and 5=*this item was almost always true for me in this subject*). Both the ITTF (α=.74) and the CCSF subscales (α=.79) were reliable in our sample. The Approaches to Teaching Inventory has been used in multiple studies across different disciplines and has been shown to predict differences in ways in which students approach learning the subject matter (for more details, see Harshman & Stains, 2017; Trigwell & Prosser, 2004; Trigwell et al., 1999).

3. Results

3.1 Plan of Analysis

To evaluate both direct and indirect relations between faculty attachment representations and their approaches to teaching we utilized path analysis, specifically Mplus version 8.4 (Muthén & Muthén, 1998-2017) to test our path models. Path analysis is a powerful methodology to evaluate structural relationships among multiple predictor and outcome variables simultaneously (Streiner, 2005). To assess goodness-of-fit for our models, we focused on the

following fit indices: Root Mean Square Error of Approximation (RMSEA; Steiger, 1990), the Comparative Fit Index (CFI; Bentler & Bonett, 1980), the chi-square statistic, and the Standardized Root Mean Residual (SRMR). Goodness-of-fit is generally indicated by a CFI value above .90, SRMR value below .08, and RMSEA value below .08. We included 95% bootstrap confidence intervals as a measure of precision of the path estimates.

3.2 Preliminary Analyses

We first examined whether there were any differences in our predictor and outcome variables across key demographic variables in our study: site of data collection (mid-sized public vs. small private institution), gender of faculty member, and race/ethnicity (because of small sample sizes, we only compared White with Non-White groups). Results of these analyses are presented in Table 1. Faculty from the large regional university reported lower levels of anxious attachment and greater positive emotions in teaching. Additionally, female faculty reported greater secure attachment, lesser avoidant attachment, and greater utilization of a conceptual change approach to teaching (CCSF). Finally, Non-White faculty reported greater utilization of the CCSF teaching approach. Below we explain how we accounted for some of these demographic differences in subsequent analyses.

Table 2 presents bivariate associations between variables of interest in this study. The three styles of attachment were correlated in expected directions with emotions in teaching. Specifically, secure attachment correlated with greater positive emotions and fewer negative emotions and both avoidant and anxious attachment correlated with greater negative emotions and fewer positive emotions in teaching. There were few direct relations between attachment styles and teaching approaches, with the exception of avoidant attachment, which was correlated with greater utilization of a teacher-focused approach (ITTF). These results suggested that the links between attachment and teaching styles may be indirect, mediated by emotions in teaching, as explored in the path analysis below.

3.3 Path Analyses

To conduct the path analysis, we first examined all possible direct and indirect relations between the three attachment styles, two types of emotions in teaching, and two teaching approaches. We then trimmed this model to remove nonsignificant paths. The final trimmed model demonstrated excellent fit statistics (χ^2 [10[=11.043, *p*=.3542; CFI = .99; RMSEA = .027 [90%ile CI; .00-.098]; SRMR=.056). The final model is shown in Figure 1 and tests of direct and indirect pathways are provided in Table 3. As displayed in Figure 1, we found two significant indirect pathways that were supportive of our main hypotheses. First, there was an indirect relation between secure attachment and a more student-focused approach to teaching (CCSF), mediated by positive emotions about teaching. Second, anxious attachment was indirectly related to a more teacher-focused approach to teaching (ITTF), mediated by negative emotions about teaching. We also found two direct pathways from attachment to teaching approaches. First, as hypothesized, avoidant attachment was related to more teacher-focused teaching, although not mediated by emotions in teaching. Second, anxious attachment was directly related to less teacher-focused teaching, which was not predicted.

Finally, to examine whether any of the demographic variables altered the overall path model, we utilized chi-square change tests in a multigroup analysis to examine if the model showed significantly worse fit when pathways were constrained to be equal across demographic groups. We found no significant decrease in fit when the model was constrained to be equal across White vs. Non-White participants ($\Delta\chi^2$ [17] =26.95, *p*=.059). We found a small decrease in fit when the model was constrained to be equal across gender of professor ($\Delta\chi^2$ [17] =37.13, *p*=.003). To further explore this finding, we tested each pathway in the model to examine differences between male and female faculty, conservatively setting α=.01 to control for multiple testing. Only one pathway was found to differ significantly across gender; specifically, for men, the association between avoidant attachment and negative emotions was positive (β=.38, *p*=.01), whereas for women the association was negative (β=-.40, *p*=.01).

Finally, we found a decrease in fit when the model was constrained to be equal across the two sites of data collection ($\Delta\chi^2$ [17] =34.29, *p*=.007). To explore this issue, we again tested each pathway in the model to examine differences between faculty teaching at the large regional university versus those teaching at the small liberal arts college. The primary difference was that the link between secure attachment and positive emotions was smaller and not statistically significant at the large regional university (β=.29, *p*=.174) compared with the small liberal arts college (β=.78, *p*=.0001).

4. Discussion

In the current study, we sought to replicate prior research showing that teaching-related emotions were associated with teaching styles among university faculty. As hypothesized, positive teaching-related emotions were associated with a greater likelihood of using a conceptual change, student-focused approach. In contrast, faculty endorsing more negative teaching-related emotions were more likely to utilize an information transfer teacher-focused approach. We

extended the literature by also examining a novel distal influence on teaching-related emotions and teaching style: faculty attachment style. Two key findings from our mediational analyses were that faculty with a more secure attachment style endorsed more positive emotions related to their teaching and, in turn, employed a more student-focused approach to teaching. Faculty with a more anxious style were more likely to endorse negative teaching-related emotions and, in turn, utilize a teacher-focused approach. Below we discuss how our findings help to elucidate why faculty adopt different teaching styles, as well as implications for faculty development and training.

Our finding that positive teaching-related emotions were associated with employing a student-focused approach was consistent with previous literature. Specifically, Trigwell (2012) found that faculty who endorsed higher levels of pride and motivation in their teaching were more likely to utilize a conceptual change, student-focused (CCSF) approach. Similarly, Zhang et al. (2019) showed that there was a strong association between positive emotions and student-focused teaching styles (i.e., legislative, liberal). This phenomenon may be explained by the broaden-and-build theory of positive emotions, which contends that positive emotions enable an individual to be more flexible, socially adept and responsive based on enhanced "attention, cognition, and action" (Fredrickson, 2004, p. 1369). In the classroom, positive emotions may engender more creativity, persistence, and an ability to flexibly deploy different strategies depending on the unique needs of the students (Frenzel et al. 2021; Zhang et al., 2019). Given that the CCSF approach to teaching involves relinquishing some control (e.g., encouraging students to "restructure existing knowledge" and "generate their own notes") and experiencing more emotionally charged moments with students (e.g., encouraging discussion about challenges they are facing with the material) (Jiang et al., 2012; Trigwell, 2012), it is not surprising that this approach was utilized more often by faculty who also reported more positive emotions, as they likely felt more equipped to navigate these circumstances and the potentially unpredictable outcomes that might emerge from these situations.

In the current study, faculty who experienced more negative teaching-related emotions, such as anxiety, embarrassment, or annoyance, were more likely to use an instructor-focused approach, which was consistent with research showing that information transfer teacher-focused (ITTF) approaches were more likely among faculty who reported higher levels of anxiety and embarrassment in their teaching (Trigwell, 2012). Importantly, this link has not been explored within a US sample previously. Our results replicate and extend studies showing that negative emotions are linked with teacher-focused teaching styles specifically within Westernized samples (Hagenauer et al., 2016; Kordts-Freudinger, 2017). Indeed, negative emotions may lead to more rigidity in one's approach and a reliance on instructor-focused methods that are less likely to result in situations requiring a faculty member to respond to a novel situation (Frenzel et al., 2021; Trigwell, 2012). Research on social anxiety, which is somewhat distinctive but likely overlaps with negative teaching-related emotions, has shown that negative emotions may allow for perceptions of danger to intrude upon working memory, thereby compromising attentional control (Peschard & Philippot, 2016). Having fewer attentional resources at one's disposal could help to explain why faculty with more negative emotions reported a higher reliance on ITTF approaches.

Adding attachment style to the analysis helped to further explain how a faculty member's emotions, or withholding of emotions, led to a particular approach in teaching. We found that an avoidant style predicted an ITTF approach to teaching. By utilizing an ITTF approach, an instructor has greater control over the classroom, which may manifest by sustaining focus on the content, steering clear of topics that could lead to feelings of vulnerability, and maintaining distance from students so that they do not come to depend on the teacher. All these behaviors allow faculty to keep their attachment system deactivated (Shaver & Mikulincer, 2014), the goal of an individual with an avoidant attachment style. There was no relation between avoidant attachment and emotions towards teaching. Faculty with this style of attachment may suppress emotional reactions (Shaver & Mikulincer, 2014) in a further attempt to keep their attachment system deactivated.

Faculty who endorsed an anxious attachment evidenced a more complicated relationship with their emotions and teaching approach. Specifically, faculty who endorsed a more anxiously attached style showed two different approaches to teaching dependent upon their emotions toward teaching. Faculty higher in anxious attachment who reported negative emotions towards teaching were more likely to employ an ITTF teaching approach. These results may be explained by the idea that when anxiously attached instructors feel negative emotions, their attachment system may become hyperactivated (Shaver & Mikulincer, 2014), which then leads to a more ITTF approach to teaching to control or manage this hyperarousal.

Our analysis found that anxiously attached faculty who did not have negative emotions toward teaching were less likely to endorse an ITTF approach in their classroom, although they did not endorse a CCSF approach either. It may be that these faculty refrain from putting themselves fully in the spotlight or giving control over to their students,

fearing the response or lack thereof. Their anxious attachment style may lead them to fear that others, in this case their students, will be unavailable or unresponsive to their needs if the faculty member plays a more prominent role in the classroom (Davidovitz et al., 2007). A further explanation for their lack of endorsement of an ITTF teaching style is the anxiously attached faculty's desire to be accepted by the group (Davidovitz et al., 2007). These individuals may believe that leading with a more inflexible style will not enable them to build relationships; at the same time, they may lack confidence in their ability to tolerate the open-ended nature of a CCSF teaching environment.

Finally, a secure attachment style was associated with positive emotions in teaching and greater endorsement of a CCSF approach to teaching, which was in line with our second hypothesis. We likely observed this association because instructors with more secure attachment styles harbor more favorable internal working models of themselves and others, which might help them to feel more optimistic in ambiguous or even challenging interpersonal situations that they encounter in teaching (Shaver & Mikulincer, 2014). Interestingly, the association between secure attachment and positive emotions was only apparent among faculty in the small college setting, not the larger university setting. Given that professors at the small college reported lower positive emotions about teaching in general, these results may suggest that a secure attachment representation was particularly important for faculty in this setting to feel good about their teaching experiences.

4.1 Limitations and Future Directions

Findings from the current study should be considered in the context of several limitations. First, since faculty reported on their emotions and teaching style related to a course selected by the researchers, their responses may not apply to all the courses they teach or may not represent the contexts in which they feel most effective. Relatedly, faculty may deliberately employ different teaching strategies in different courses (e.g., a more instructor-focused approach in larger and/or introductory courses; a more student-centered approach in smaller, seminar style courses), so the course format and/or size, not captured in the current study, also may affect decisions about teaching strategies. The self-report nature of our survey also introduces the possibility that faculty have not accurately represented their attachment, emotions, or teaching styles. As noted by Frenzel et al. (2021) "while self-reporting how they feel, teachers may also implicitly report how they believe they should feel" (p. 258). That is, faculty may respond in a socially desirable manner, or may consciously or unconsciously misrepresent themselves (Frenzel et al., 2021). Future research might integrate student assessments of faculty teaching styles or possibly draw on other data sources (e.g., syllabi, teaching observations) to capture faculty approaches to teaching in a different manner.

While our participants included faculty from two different institutions in different regions of the United States, it is possible that our findings may not generalize to faculty in other parts of the US or globally. On the one hand, we replicated associations between teaching-related emotions and teaching style reported by researchers in Australia (Trigwell, 2012) and China (Zhang et al., 2019), suggesting that these associations may be robust cross-culturally. On the other hand, we observed some site differences (e.g., lower positive emotions and higher anxious attachment at the small college, no association between secure attachment and positive emotions in the larger university setting) suggesting heterogeneity in some of the constructs and their associations. Moreover, different fields of study and course formats may lead faculty to adopt different teaching styles. For example, an information-transfer approach may be deemed more effective when teaching courses with large enrollments or courses with a large amount of factual information (e.g., natural science courses). Of note, in the current study we did not observe differences in teaching styles across disciplines, so it seems unlikely that course content was the primary driver of teaching styles.

Another limitation concerns the possibility for bidirectional relations among the constructs, particularly teaching-related emotions and teaching styles. Specifically, faculty who provide more student-focused instruction might cultivate better rapport with students, and consequently feel more positive about their teaching experiences (Frenzel et al., 2021). Faculty who are more focused on information transfer may be more likely to experience resistance or disengagement from students, intensifying negative teaching-related emotions (Frenzel et al., 2021). More in-depth research with faculty, such as diary studies, studies that use experience sampling, or intervention research focused on increasing faculty use of student-focused teaching may help to elucidate the nature of the association between these constructs and their malleability.

Finally, there are likely numerous other influences on teaching-related emotions and teaching approaches besides attachment style. Faculty members' own educational histories, particularly exposure to teachers they admired, likely shape their expectations about, and approaches to teaching (Grasha, as cited in Zhan et al., 2015). Future research should explore a broader array of influences on faculty teaching styles recognizing that some factors, such as attachment style, may be outside of faculty awareness yet still exert considerable influence on instructional approaches.

4.2 Implications

Our findings suggest that enhancing awareness of the potential links between attachment, emotions, and teaching style among higher education faculty may be beneficial in the orientation of new faculty and/or professional development for existing faculty. It may be most feasible to increase attention to these factors as part of existing interventions for educators. For example, discussion about attachment orientations and teaching-related emotions could be integrated into pedagogical training aimed at increasing student-centered teaching. Previous research has shown that pedagogical training can increase the likelihood that faculty will utilize a student-focused approach (i.e., CCSF) and decrease the use of an information-focused approach (i.e., ITTF), but often only after extensive training lasting more than six months, or up to one year (see Cassidy & Ahmad, 2021 for a review). Increasing awareness of some of the distal factors (i.e., attachment, teaching-related emotions) that motivate one's approach might help to accelerate change in one's propensity to use student-centered methods.

It is possible that merely raising awareness of these distal influences on teaching approaches may not be sufficient to change them. In cases where a faculty evidence considerable attachment insecurity, more in-depth interventions such as Contextual Insight-Navigated Discussion (CIND; Riley, 2010) might be indicated. CIND involves six, one-on-one sessions with a mental health professional where educators explore how relationship dynamics from their family might be relevant to understanding how they engage with, and react to students, especially in emotionally charged situations. The primary goal of CIND is to enhance self-awareness of one's relational style and its underpinnings so that educators can be more perceptive and responsive to students and colleagues (Riley, 2010).

In conclusion, the current study suggests that attachment is a useful lens through which to understand why faculty might feel more positively or negatively about their teaching and, in turn, the teaching approaches they employ. Since attachment tendencies likely are durable, particularly at the life stages of most faculty, it seems most practical not only to raise awareness about the role of attachment in teacher-student relationships, but also to focus on the recognition and regulation of teaching-related emotions and how these emotions might influence one's selection of instructional strategies (Frenzel et al., 2021). Given the dearth of research on attachment and its correlates among university faculty, this study is an important first step in pointing to innovative approaches to support faculty well-being and effectiveness and decrease feelings of burnout and isolation, with the ultimate goal of improving students' experiences in higher education.

Table 1. Sociodemographic differences in the study variables

	Secure Attachment	Avoidant Attachment	Anxious Attachment	Positive Emotions	Negative Emotions	CCSF	ITTF
Site							
Large Regional Univ. (*n*=104)	4.39 (.71)[A]	2.90 (.70)[A]	2.69 (.73)[A]	4.42 (.39)[A]	1.95 (.71)[A]	3.50 (.73)[A]	2.85 (.73)[A]
Small Liberal Arts Col. (*n*=35)	4.24 (.71)[A]	2.91 (.62)[A]	2.97 (.65)[B]	4.11 (.53)[B]	1.81 (.60)[A]	3.46 (.84)[A]	2.75 (.80)[A]
Gender							
Men (*n*=56)	4.20 (.77)[A]	3.04 (.72)[A]	2.81 (.78)[A]	4.25 (.47)[A]	1.99 (.81)[A]	3.29 (.78)[A]	2.89 (.77)[A]
Women (*n*=78)	4.47 (.64)[B]	2.79 (.65)[B]	2.72 (.75)[A]	4.35(.47)[A]	1.83 (.54)[A]	3.61 (.72)[B]	2.77 (.73)[A]
Ethnicity							
White (*n*=117)	4.33 (.74)[A]	2.89 (.53)[A]	2.77 (.73)[A]	4.29 (.48)[A]	1.93 (.72)[A]	3.42 (.76)[A]	2.80 (.72)[A]
Non-White (*n*=22)	4.43 (.50)[A]	2.97 (.72)[A]	2.68 (.69)[A]	4.50 (.33)[A]	1.73 (.34)[A]	3.85 (.61)[B]	2.96(.88)[A]

Groups with differing superscripts indicate significant differences, using independent-samples t-tests (*p*<.05). CCSF= Conceptual-Change Student-Focused Approach; ITTF=Information-Transfer Teacher-Focused Approach

Table 2. Bivariate correlations between attachment styles, emotions in teaching, and approaches to teaching

	Avoidant Attachment	Anxious Attachment	Positive Emotions	Negative Emotions	CCSF	ITTF
Secure attachment	-.76***	-.66***	.42***	-.56***	.10	-.12
Avoidant attachment		.56***	-.24*	.48***	-.11	.27**
Anxious attachment			-.31***	.60***	-.07	-.03
Positive emotions				-.41***	.26**	.02
Negative emotions					-.09	.28**
CCSF						-.18*

*p< .05; **p< .01; ***p< .001. CCSF= Conceptual-Change Student-Focused Approach; ITTF=Information-Transfer Teacher-Focused Approach.

Table 3. Direct and indirect effects of attachment styles on teaching approaches through emotions in teaching

Pathway	Estimate (β)	Standard Error (SE)	95% CI	p
Student-Center Teaching (CCSF)				
1. Direct Effects				
Secure Attachment	-.125	.153	[-.506, .23]	.414
Avoidant Attachment	-.148	.130	[-.455, .161]	.255
Anxious Attachment	.038	.123	[-.208, .294]	.759
2. Indirect Effects				
Secure Att.->Pos. Emotions->CCSF	**.149**	**.071**	**[.027, .297]**	**.036**
Secure Att.->Neg. Emotions->CCSF	.008	.023	[-.079, .14]	.742
Avoidant Att.->Pos. Emotions-CCSF	.054	.044	[-.021, .143]	.220
Avoidant Att.->Neg. Emotions->CCSF	-.001	.007	[-.042, .083]	.828
Anxious Att.->Pos. Emotions->CCSF	-.012	.034	[-.088, .059]	.725
Anxious Att.->Neg. Emotions->CCSF	-.018	.054	[-.187, .107]	.739
Teacher-Centered Teaching (ITTF)				
1. Direct Effects				
Secure Attachment	.100	.146	[-.199, .425]	.493
Avoidant Attachment	**.415**	**.119**	**[.178, .664]**	**.001**
Anxious Attachment	**-.412**	**.113**	**[-.640,-.160]**	**.001**
2. Indirect Effects				
Secure Att.->Pos. Emotions->ITTF	.078	.059	[-.045, .213]	.191
Secure Att.->Neg. Emotions->ITTF	-.087	.068	[-.304, .110]	.199
Avoidant Att.->Pos. Emotions->ITTF	.028	.027	[-.031, .100]	.300
Avoidant Att.->Neg. Emotions->ITTF	.016	.057	[-.161, .172]	.773
Anxious Att.->Pos. Emotions->ITTF	-.006	.018	[-.067, .033]	.723
Anxious Att.->Neg. Emotions->ITTF	**.204**	**.071**	**[.070, .372]**	.004

CCSF= Conceptual-Change Student-Focused Approach; ITTF=Information-Transfer Teacher-Focused Approach.
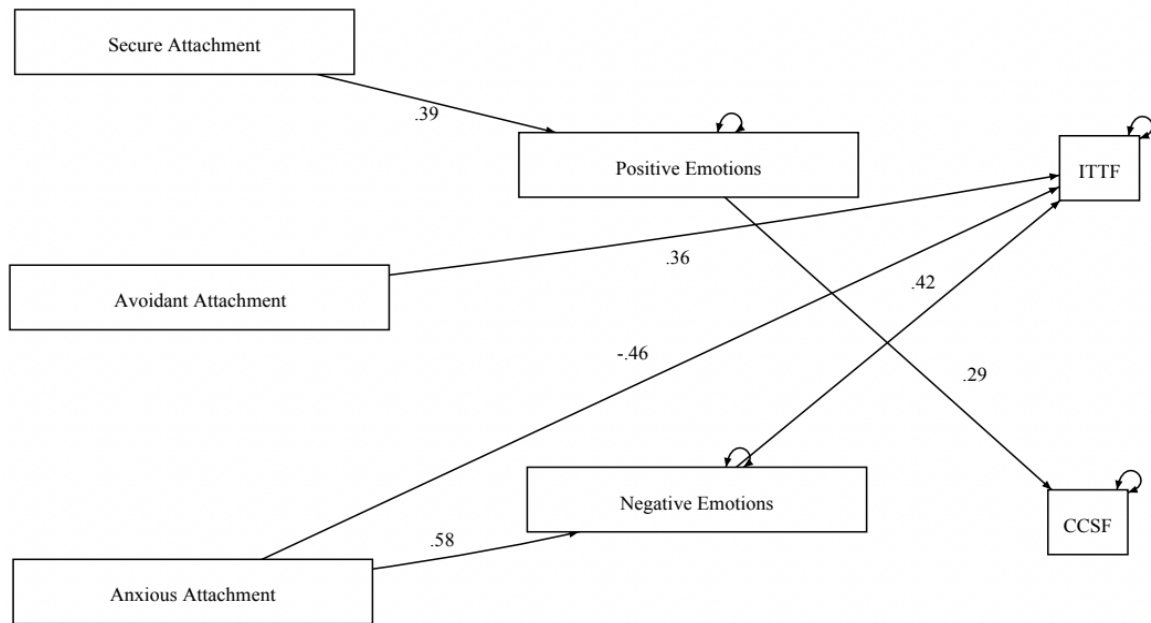
Figure 1. Path model of attachment styles, emotions in teaching, and teaching approaches

CCSF= Conceptual-Change Student-Focused Approach; ITTF=Information-Transfer Teacher-Focused Approach. All paths shown in the model were statistically significant ($p<.01$).

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