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Belongingness in Graduate School: The Effect of Belonging on the Relationship Between
Advisor Trust and Burnout

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ABSTRACT

A sense of belonging is essential to every person, not just as a want but as a need for thriving and even survival. Belongingness means the need to form and maintain at least a minimum quantity and quality of interpersonal relationships. In academic contexts, belongingness plays a crucial part in one's academic success, especially in reducing burnout which can be damaging to an individual's motivation. At the Ph.D. level, research suggests that trust in advisors may also play a crucial role in preventing burnout. The purpose of this study was to determine whether belongingness moderates the relationship between Ph.D. students' advisor trust and burnout. I hypothesized that for students with a higher sense of belonging, advisor trust would matter less because their relatively high belonging would already buffer against burnout risk. I hypothesized that students with a lower sense of belonging would be more vulnerable, so advisor trust would play a larger role, with higher trust predicting lower burnout. Doctoral students at Stanford, Columbia, and Penn State universities were recruited and completed multiple surveys across their first year of graduate school to measure their belongingness, advisor trust, and burnout. Results revealed a significant moderating effect of belonging on the association between advisor trust and burnout. However, simple effects tests revealed a pattern that was different than what was hypothesized. For students with low belonging, advisor trust did not predict burnout, whereas for students with high belonging, advisor trust predicted significantly lower burnout. Results suggest that the lowest levels of burnout were associated with both high advisor trust and high belonging.

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Chapter 1

Introduction

A sense of belonging is essential for every person. It is more than just a want to be with others but can be considered a necessity for survival. The reason for this seems to come from an evolutionary basis. Groups in the past tended to share food, provide mates, and help care for each other's offspring in order to promote survival of the group's members (Baumeister & Leary, 1995). Thus, historically, a sense of belonging to a group can be seen as critical for human survival. Having a sense of belonging has a plethora of positive effects on both our emotions and our cognitions (Baumeister & Leary, 1995). For emotions, it leads to positive affect and even intense bliss and joy when belonging is very positive (Baumeister & Leary, 1995). Occasions that spark new relationships and friendships are often celebrated and associated with positive emotions. For cognition, research suggests that people store information better for closer relationships than for weak or distance ones, which suggests that human brains have developed to prioritize social relationships (Baumeister & Leary, 1995). Human relationships are essential for human emotion and thought. On the other side, the deprivation of social relationships can lead to behavioral and emotional problems (Baumeister & Leary, 1995). People tend to feel anxious when losing important relationships and can feel quite lonely when these relationships are cut off from them (Baumeister & Leary, 1995). The recent COVID-19 pandemic provides a great example of this where it was found that social isolation can lead to adverse health effects like heart disease, depression, and premature death (CDC, 2021). For students, a greater sense of belonging can lead to positive psychological and academic outcomes with both long- and short-

term implications (Allen, 2022). No matter where one goes in the world, a sense of belongingness is important for one's overall well-being.

In academic contexts, belongingness seems to have a major effect on many different outcomes, including academic achievement. For instance, research has found a link between belongingness and engagement, which in turn leads to academic achievement (Marks, 2000). Persistence is another factor that has been shown to increase with belongingness, where people are more likely to push through tough classes if they feel like they belong in the environment (Marks, 2000).

Another benefit of belongingness is that it has been shown to decrease burnout. Burnout can be defined as emotional exhaustion, desensitization, and a sense of low personal accomplishment due to responding to intense emotional demands in an individual who is continually working (Maslach & Leiter, 2016). When a student starts to feel burnout, this can lead to them feeling tired, losing motivation in class, having an apathetic attitude toward school, and doubting themselves (Zhang et al., 2005). This can be damaging to their academic achievement in school if they no longer feel motivated. However, it has been found that increasing a person's sense of school belonging can be effective in preventing burnout as well (Aker & Sahin, 2022). By increasing belonging, it appears that engagement increases which has been shown in medical students to help prevent burnout symptoms (Puranitee et al., 2022). Engagement is critical to making sure that one's basic psychological needs are satisfied and thus may reduce burnout (Puranitee et al., 2022).

At the Ph.D. level, students' trust in their advisor is another factor that may prevent burnout. Advisor trust can include empathy, advisor-advisee rapport, and how much advisors

makes students feel like they belong (Yuan, 2021). Specifically, in doctoral education, the mentor-mentee relationship is a central part of life for Ph.D. students. Students need to be able to feel like they can talk to their advisor about any challenges they face as well as their goals. For that to happen, students need to be able to trust their advisor. While research on advisor trust, particularly at the Ph.D. level, is relatively rare, some studies have found that a trusting academic advisor relationship can increase a student's sense of belonging among international students (Yuan, 2021). For students who have a high sense of belonging, this could mean that advisor trust matters less as they have sufficient belonging to buffer against burnout even if they have low advisor trust. For students with low belonging, higher advisor trust should lead to lower burnout as they might not otherwise be receiving the benefits of a sense of belonging.

In the next section, I will review the literature on belonging, burnout, and advisor trust. I will define these terms further and discuss the general effects of each. Finally, for each term, I will discuss how it can affect life for graduate students specifically.

Chapter 2

Literature Review

Looking at the history and establishing a definition for belongingness, burnout, and advisor trust is important to identify how belonging might affect burnout and the association of advisor trust with burnout. This section will review previous literature focusing on defining these terms and their effects, particularly the implications for graduate students.

Belonging has been researched extensively due to it being viewed as a fundamental human need. Baumeister and Leary conducted an influential review in 1995 that focused on theories and results of belongingness. They proposed that humans have a need to belong, or the idea that people “need to form and maintain at least a minimum quantity of interpersonal relationships,” that is innately prepared (Baumeister & Leary, 1995, p. 1). Belongingness, according to Baumeister and Leary, comes from an evolutionary basis. They reasoned that people who stayed in groups were more likely to survive until their reproductive years because they had the care and protection of others (Baumeister & Leary, 1995). The need to belong furthers this idea by saying that relationships are desired, so one of the potential purposes of interacting with a stranger is to get toward a long-term relationship with that person so that we can learn their practical skills (Baumeister & Leary, 1995).

Belongingness has been found to affect people positively and negatively depending on whether our need to belong feels fulfilled. One part of that is how belongingness can affect our cognition. Research suggests that people tend to think more about their relationship partners than others and to store more information for stronger relationships such as marriage compared to weaker relationships like acquaintanceships (Baumeister & Leary, 1995). The idea that our

brains are designed to be able to store more information for our close relationships suggests that our brains are socially oriented, which highlights the importance of belonging. Perhaps even more relevant is the emotional implications of feeling like one belongs. Evidence suggests that when people feel accepted or included, it can lead to a variety of positive emotions such as happiness and elation (Baumeister & Leary, 1995). However, when people feel rejected or excluded, this can lead to negative emotions such as anxiety, grief, and depression (Baumeister & Leary, 1995). Both positive and negative emotional reactions seem strongly related to relationship status (Baumeister & Leary, 1995). Parr et al. in 2020 found that belonging was the largest known correlate with symptoms of depression. There have also been many benefits of belonging for mental health and emotional well-being, self-esteem, academic success, and even lower school dropouts (Allen et al., 2022). In an academic context, a sense of belonging can increase one's academic motivation and thus lead to academic success (Freeman et al., 2007). In addition, having higher school belonging has been found to increase peer-group interactions and academic development (Hausmann et al., 2009). With those peer-group interactions and motivation, it would make sense that those with higher belonging succeed more in academia as they have more social support and a greater desire to succeed in school.

In academia specifically, belonging seems to have a huge impact on students. While research is limited at the Ph.D. level, considerable research exists at the undergraduate level. A meta-analysis by Korpershoek et al., in 2019 notes the effects of belonging on student motivation. Multiple studies conducted in the last decade have shown that a sense of belonging has positive effects on school motivation and academic achievement and is negatively related to school dropout (Korpershoek et al., 2019). In another study, an intervention to strengthen peer networks was found to promote persistence by increasing the number of students taking the next

course in a STEM sequence (Turetsky et al., 2020). The peer networks that led to end-of-semester friendships are what statistically mediated this change.

Burnout is the next topic that needs to have some background information. Burnout can be seen in many contexts, specifically with stressors with jobs. It is usually defined by three key dimensions: (1) exhaustion, (2) feelings of cynicism and detachment from the job, and (3) a sense of ineffectiveness and lack of accomplishment (Maslach & Leiter, 2016). In an academic context, burnout refers to exhaustion and disengagement symptoms among students from long-term exposure to school demands (Oloidi et al., 2022). Burnout in school can lead to psychological, health, behavioral, and organizational consequences. For psychological consequences, studies have found that it can lead to concentration problems, difficulty in decision-making, anxiety, depression, and many more (Edu-Valsania et al., 2022). Health consequences include increased vulnerability to infections, chronic fatigue, and increased blood cortisol levels which can lead to an increased risk factor for type 2 diabetes (Edu-Valsania et al., 2022). The behavioral consequences seem mostly related to job dissatisfaction and reducing one's performance at that job so much that it can lead to counterproductive behaviors (Edu-Valsania et al., 2022). Collectively, these symptoms can affect the greater organization as they may cause conflict and interruptions in workgroup tasks and lead to a negative working environment (Edu-Valsania et al., 2022).

Research in academic contexts demonstrates that burnout can lead to a significant drop in performance. In a meta-analysis of over 100,000 students, burnout had a significant negative relationship with academic achievement as exhaustion, cynicism, and reduced efficacy increased (Madigan & Curran, 2021). In the bigger picture, academic burnout seemed to overall predict

negative life satisfaction as well (Wang et al., 2022). It appears that many of the effects of burnout that are typically associated with the workplace seem to transfer to academia as well. As such, burnout seems very debilitating to students and should be looked at and addressed. Belonging may be one of the ways that we can address this as promoting belonging has been found to decrease burnout (Puranitee, 2022).

The last construct I describe is advisor trust. In graduate school, advisors take on a significant role in students' academic experience, as students work closely with doctoral advisors in a mentor-mentee relationship. Research on this topic has been quite limited with not a lot of published studies. It has been found that a positive student-advisee relationship that is built on a foundation of trust and communication can have positive effects on students, such as making students more likely to complete assignments in a timely manner, more likely to consult their advisor on individual goals, and encouraging independence (Young et al., 2019). However, while a healthy mentoring relationship is beneficial, it may not directly lead to lower attrition rates (Young et al., 2019). It is important to note that despite this, by having solid communication and a structured meeting schedule, there is potential evidence that advisor trust can increase the success of Ph.D. students (Young et al., 2019). Empirical research has also shown that satisfaction with advisors is associated with greater satisfaction with the environment, helping students to persist with their work (Hawkthorne & Young, 2010).

There is additional evidence that having a solid relationship with one's academic advisor may lead to higher academic achievement (Kavenuke, 2015). For instance, a trusting advisor relationship was associated with better education outcomes for students, such as higher grades in classes or more likely to obtain degrees (Kavenuke, 2015). Additionally, being dissatisfied with

one's advisor is correlated with burnout (Teasley & Buchanan, 2016). The opposite result has also been found as those who were satisfied with their advisor had lower burnout (Allen et al., 2022).

In this thesis, I investigate how belongingness and advisor trust predict burnout. Specifically, I will examine whether belongingness affects the relationship between advisor trust and burnout. I expect that greater advisor trust and a greater sense of belonging will both independently predict lower burnout. In addition, I hypothesize that belongingness will moderate the association between advisor trust and burnout. For students with high belonging, I predict that advisor trust will matter less because high belonging itself provides a sufficient reservoir of mental reserve to reduce burnout. For students with low belonging, advisor trust should matter more, lowering burnout because without a foundation of belongingness students may be more dependent on a trusting advisor relationship.

The reason for the predictions for students with high belonging is the idea of it being able to buffer against something like a bad advisor. From recent research, we have seen that belonging can have positive effects on academic achievement, which then decrease one's feeling of burnout (Aker & Sahin, 2022). Having a meaningful connection through belonging stimulates a person's motivation (Puranitee et al., 2022). Because of that, I predict that while having a bad advisor may normally negatively affect one's burnout, belonging may help prevent that as it increases one's academic achievement and thus reduces burnout. For students with low belonging, because of the relationship between advisor trust and burnout, advisor trust will be what lowers burnout because there is no longer that belongingness factor.

Chapter 3

Method

Participants

Participants were two cohorts of incoming doctoral students at Penn State, Stanford, and Columbia universities during the 2018–2019 and 2019–2020 academic years. All first-year STEM Ph.D. students at these universities were eligible to participate, and a smaller number of non-STEM students were also targeted at Penn State. At Penn State and Stanford, additional non-STEM students who became aware of the study at orientation events were also allowed to participate. The pattern and magnitude of our findings do not change if we control for university.

A total of 523 participants had complete data for belonging, advisor trust, and burnout. Participants were roughly evenly divided between males (48.95%) and females (50.29%) with 4 participants indicating a nonbinary gender (0.76%). The average age of participants was 22.9 with a range from 19 to 45 years old. We grouped participants into 5 broad field categories based on the focus of their Ph.D. program, consistent with previous approaches to classifying field of study created by the Council of Graduate Schools (2021): engineering ($n = 215$; 41.11%), humanities ($n = 9$; 1.72%), life sciences ($n = 90$; 17.21%), physical sciences & mathematics ($n = 108$; 20.65%), and social & behavioral sciences ($n = 101$; 19.31%). There were a smaller number of students from humanities because these students were not directly targeted for participation but were allowed to participate if they became aware of the study. By design, the fewest participants were from Columbia ($n = 107$; 20.46%), and the most from Penn State ($n = 263$; 50.29%), with Stanford in between ($n = 153$; 29.25%). For race, participants identified as White

(including Caucasian, Anglo, European American; not Hispanic; 41.87%), International (35.56%), Asian (including Chinese, Japanese, Indian, and others; 12.62%), Hispanic (including Mexican American and Central American; 3.06%), Black or African American (2.29%), and Native American (0.19%). Participants also identified as mixed race/ethnicity, of whom some were a mix of at least one underrepresented racial/ethnic group (2.87%) and others were mixed White and Asian (1.34%).

Procedure

Participants completed baseline measures right before or during the first 1–2 weeks of their first year of graduate school. The baseline survey was designed to capture students' attitudes, behaviors, and beliefs as they began graduate school. All students who completed the baseline survey were invited to the longitudinal phase of the study, except for a small number who were pursuing their Ph.D. at a satellite campus and would not have been able to attend in-person parts of the study. The longitudinal study was designed to capture students' experiences in graduate school over time, including eight surveys in non-consecutive weeks spanning 10 months of students' first year of graduate school. The goal of these surveys was to assess changes from baseline in students' psychological and behavioral outcomes. More details on the recruitment process are provided below. Overall, 1,085 students completed the baseline survey. Of these, 656 students entered the longitudinal phase of the study.

We recruited participants by email across all campuses. At Penn State and Stanford, participants were also recruited at in-person orientation sessions for incoming graduate students.

The study's focus was described to prospective participants as aimed at understanding the experiences of Ph.D. students throughout graduate school.

The recruitment email, which included a link to the baseline survey, was distributed to all incoming students in targeted fields by graduate deans at Penn State and Columbia and the dean of the School of Engineering at Stanford. For other STEM departments at Stanford, we sent the recruitment email to department chairs and directors of graduate studies and asked them to forward the emails to incoming Ph.D. students in their departments. We did this because we did not have access through the dean's office to contact students in these departments directly. Because the emails were sent by university administrators and faculty on our behalf, we could not assess the student-level characteristics of non-participating students. Furthermore, administrators and faculty who assisted with recruitment were not informed which students participated in the study. Participants were also assured that no one outside of the research team (including university administrators and their academic advisors) would know if they participated. Participants received a \$15 gift card for completing the 45-min baseline survey.

The email inviting students to participate in the longitudinal phase provided information about the study and asked participants to sign up for an in-person orientation using an embedded link. We held orientation sessions in groups of 2–20 students during the second and third weeks of the academic year. During the orientation sessions, students were provided with details of the longitudinal phase of the study and completed a brief experimental intervention activity described below.

As noted above, students' experiences were assessed over eight non-consecutive weeks in their first year of graduate school. At Penn State and Columbia, three surveys were administered

during each of the fall and spring semesters. At Stanford, which uses a quarter-based academic calendar, two surveys were administered during each of the autumn, winter, and spring quarters. Finally, at all three campuses, one survey was administered during winter break and the final survey was administered approximately 2 weeks after final exams at the end of the academic year. We label these end-of-week (EOW) surveys because each survey except over winter break was preceded by 7-days of smartphone-based experience sampling surveys; these experience sampling surveys were not analyzed in the present study. Data from EOW surveys are what I analyze in this honor's thesis. Participants were paid per survey at a rate of approximately \$25 per hour based on the expected time to it would take to complete each survey (e.g., \$7.50 for each 15–20 min survey used in the current study), with bonuses for high survey completion rates.

Although, not a focus here, the larger project included an experimental intervention with three randomly-assigned conditions—values affirmation (Cohen et al., 2006), social belonging (Walton & Cohen, 2011), or control—delivered during in-person orientation sessions and three additional times throughout the academic year in smartphone surveys. Using a block randomization strategy, participants were assigned to one of the three experimental conditions (see Park et al., 2023 for details). In analyses below, I present results with and without controlling for intervention condition, which did not change the primary test of moderation.

Measures

Demographics

Participants answered several demographic questions. For sex, participants answered whether they identified as a male, female, trans male, trans female, genderqueer, or non-conforming, and entering into a textbox any other identity. In the analyses below where I control for gender, I created a dichotomous variable comparing people who identified as male (0) to people who identified as other than male (1; i.e., females and non-binary participants). For race, participants answered how they would describe their race and ethnicity and then checked boxes for as many races that applied to them. These included Native American, Asian, Black or African American, Hispanic or Latino, White, and a place for them to indicate another race and a text box for them to write it in. Students from outside the United States were categorized as international regardless of their race/ethnicity. Participants also provided the name of their Ph.D. program, which was used to place people into broad field categories.

Belonging

Participants belonging in graduate school was assessed using nine items (e.g., “I feel like I belong in graduate school”; Walton & Cohen, 2007; Cook et al., 2012) that participants completed at each end-of-week (EOW) survey on a scale from 1 (*Strongly disagree*) to 7 (*Strongly agree*). For the present research, I use responses to this scale from the first three EOW surveys. I averaged the nine items at each EOW survey (Cronbach’s alpha from .85 to .87) and then averaged the three belonging scores from EOW 1, 2, and 3 to create a composite measure of

early graduate school belonging assessed prior to our assessment of advisor trust, with higher scores indicating a greater sense of belonging. The reasoning for using belonging from EOW 1-3 (as opposed to the earlier baseline survey, which also assessed belonging) is to allow students to settle into their environment before giving their ratings. In addition, having multiple weeks may avoid having an outlier if a student had a bad day when they were taking a survey.

Advisor Trust

Advisor trust was measured using three items (e.g., I trust my advisor) on a scale from 1 (*Strongly disagree*) to 7 (*Strongly agree*). The scale used was generated by the research team for the purpose of this research. Advisor trust was assessed at the EOW survey from week 3. The three items from that survey were then averaged (Cronbach's alpha = .71) with higher scores indicating greater trust in one's advisor. The reasoning for using advisor trust during week 3 is it is the earliest data point that this construct was assessed. Although we also assessed advisor trust later in the year, I reasoned that the earlier measure is better because it reflects advisor trust early in graduate school, which may be a particularly sensitive time psychologically speaking, with important later consequences.

Burnout

Burnout was measured using six items (e.g., "I am emotionally drained from my work"; Maslach & Jackson, 1981) that participants rated on a scale from 1 (*Never*) to 7 (*Every day*). Due to space constraints in the EOW surveys, we shortened the original scale by selecting the two items with the highest factor loadings from each of the three subscales. Additionally, items were

rephrased to better suit a graduate school setting. My primary outcome was participants' report of burnout during the second half of their first year of graduate school. To create this variable, I first averaged the six burnout items at EOW surveys 5-8 and then averaged these four scores to create an overall composite measure with higher scores indicating higher burnout during the second half of the academic year. The six items had adequate reliability across the surveys (Cronbach's alpha from .69 to .76.). I also used burnout assessed at the same time as advisor trust (i.e., EOW 3) to use as a baseline covariate (Cronbach's alpha = .71).

Chapter 4

Results

I begin by presenting basic descriptive and correlation statistics for my three primary variables of interest: belonging, burnout, and advisor trust. Then, I report the results of regression analyses predicting burnout from belonging and advisor trust and testing whether belonging moderates the relationship between advisor trust and burnout. Statistical analyses were all conducted in R (RStudio Team, 2020). The table below shows the mean, standard deviations, and inter-correlations for all three variables.

Descriptive and Correlation Statistics

Table 1: Descriptive and Correlation Statistics

Variable	Mean	Standard Deviation	1	2	3
1. Belonging	5.16	0.88	1.00		
2. Semester 2 Burnout	3.72	0.93	-0.53***	1.00	
3. Advisor Trust	5.40	1.02	0.36***	-0.33***	1.00

Note. $N = 523$. Belonging, burnout, and advisor trust are all on a scale from 1-7

* $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$

As seen in the table above, belonging and advisor trust are quite high at a score of above 5 on a scale from 1 to 7. This corresponds to an average response of “slightly agree” to these items on the survey. A majority of students would fall into the range between 4.28 and 6.04 as that is 1 standard deviation below and above the mean for belonging. Also notable is that burnout

is not that high, as its mean is only 3.72, which is right around the scale midpoint or a response of a few times a month. A majority of the students for burnout would fall into the range between 2.79 and 4.65 for 1 standard deviation below and above the mean for burnout. The significant negative correlation of -0.53 between burnout and belonging makes sense as one would expect a person's burnout to be lower if they had a higher sense of belonging and vice versa. Advisor trust also follows a similar pattern, such that greater advisor trust is associated with lower burnout, with a significant correlation of -0.33. For advisor trust, most students would fall between 4.38 and 6.42. It makes sense that a person would feel a greater sense of belonging if they had higher trust in their advisor which can be seen with a significant positive correlation of 0.36. Since the advisor plays a huge role in a graduate student's experience, it makes sense that trust would contribute to belonging.

Predicting Semester 2 Burnout as a Function of Belonging and Advisor Trust

The first model that I am looking at is without the interaction between belonging and advisor trust to test the additive effects of these variables on burnout. I first look at the model with only advisor trust and belonging as predictors and then I look at the model again after controlling for potentially confounding covariates. The covariates are (1) burnout assessed at the EOW 3 survey; (2) gender (0 = male, 1 = not male); (3) campus, dummy coded so that Penn State is the reference group compared to Columbia (first dummy code) and to Stanford (second dummy code); and (4) condition, dummy coded so that the control condition is the reference group compared to the belonging condition (first dummy code) and to the affirmation condition

(second dummy code). Then, I will test whether belongingness moderates the association of advisor trust with burnout. If there is a significant interaction, I will conduct simple effect tests.

Controlling for advisor trust, for every 1 point increase in belonging, burnout is expected to decrease by .50 points, $t(520) = -12.02, p < .001, \eta_p^2 = .22, 95\% \text{ CI } [-0.58, -0.42]$. Controlling for belonging, for every 1 point increase in advisor trust, burnout is expected to decrease by .15, $t(520) = -4.06, p < .001, \eta_p^2 = .03, 95\% \text{ CI } [-0.22, -0.08]$.

After controlling for week 3 burnout, campus, condition, and gender as covariates, belonging remained a significant predictor, with burnout expected to decrease by .15 for every 1 point increase in belonging, $t(514) = -4.17, p < .001, \eta_p^2 = .03, 95\% \text{ CI } [-0.23, -0.08]$. However, after controlling for covariates, advisor trust was no longer significant, $b = -.04, t(514) = -1.49, p = .14, \eta_p^2 = .004, 95\% \text{ CI } [-0.10, 0.01]$.

I then checked the significance of the covariates. On average, and controlling for the other covariates, students at Columbia were .15 points lower in burnout than students at Penn State, $t(514) = -2.24, p = .03, \eta_p^2 = .01, 95\% \text{ CI } [-0.29, -0.02]$, while students at Penn State were .15 points lower in burnout than students at Stanford, $t(514) = 2.47, p = .01, \eta_p^2 = .01, 95\% \text{ CI } [0.03, 0.27]$. For condition, students who received the belonging intervention were .17 points lower in burnout than students in the control condition, $t(514) = -2.65, p < .01, \eta_p^2 = .01, 95\% \text{ CI } [-0.29, -0.04]$. Similarly, students who received the affirmation intervention were lower in burnout by -.12 compared to students in the control condition, an effect that was marginally significant, $t(514) = -1.94, p = .05, \eta_p^2 = .01, 95\% \text{ CI } [-0.25, 0.00]$. As would be predicted, week 3 burnout was strongly associated with burnout in students' second semester, with each one point higher people were in burnout at week 3 associated with burnout being .57 higher in second

semester burnout, $t(514) = 18.1, p < .001, \eta_p^2 = .39, 95\% \text{ CI } [0.53, 0.63]$. Finally, female and non-binary students together felt more burnt out than males by .1, which was also marginally significant, $t(514) = -2.65, p < .01, \eta_p^2 = .01, 95\% \text{ CI } [-0.29, -0.04]$.

In the second step, returning to the model without the demographic covariates, the interaction between belonging and advisor trust significantly predicted burnout, $t(519) = -2.73, p < .01, \eta_p^2 = .01, 95\% \text{ CI } [-0.16, -0.03]$. Then, I controlled for week 3 burnout, campus, and gender as covariates but the interaction was still significant, $t(513) = -2.30, p = .02, \eta_p^2 = .01, 95\% \text{ CI } [-0.11, -0.01]$. The pattern of covariates was unchanged with the inclusion of the interaction.

For the next section, to better understand the pattern of results given there was a significant interaction, I conducted simple effect tests. I looked at the simple effect for advisor trust one standard deviation below and above the mean for belonging. I then looked at the simple effects for belonging one standard deviation below and above the mean for advisor trust (see Figure 1).

Simple Effect Tests

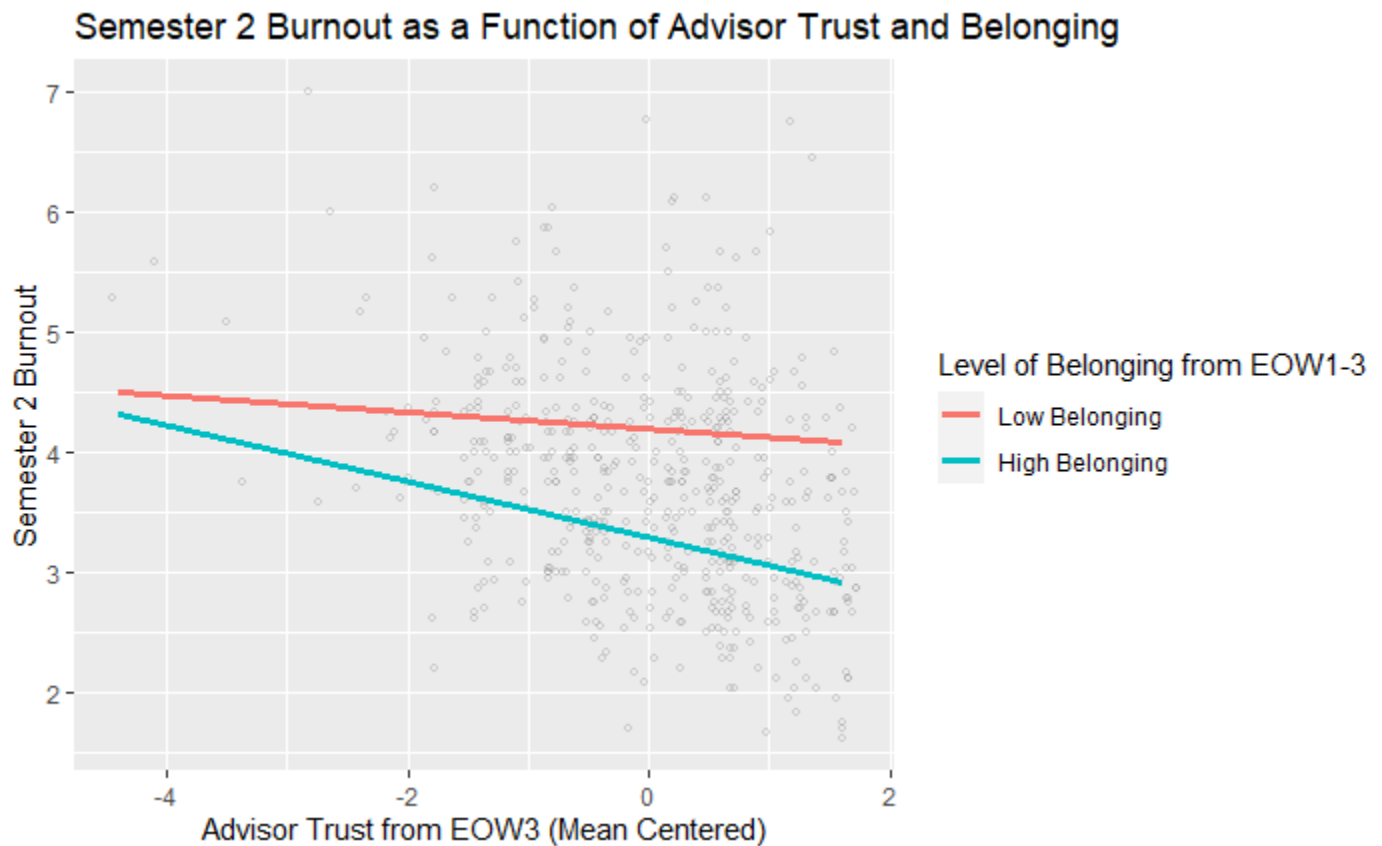


Figure 1. Semester 2 Burnout as a Function of Advisor Trust and Belonging

When belonging is one standard deviation below the mean, advisor trust predicted slightly lower burnout, but the association was not significant, $b = -.07$, $t(519) = -1.57$, $p = .12$, $\eta_p^2 = .01$, 95% CI [-0.16, 0.02]. When belonging is one standard deviation above the mean, advisor trust predicts significantly lower burnout, $b = -.23$, $t(519) = -4.86$, $p < .001$, $\eta_p^2 = .04$, 95% CI [-0.33, -0.14]. This can also be seen in Figure 1 as those high in belonging see a stronger downward association in burnout with greater advisor trust, whereas those lower in belonging have consistently higher burnout but less decrease with greater advisor trust.

Then, I conducted another simple effect test for when advisor trust is one standard deviation below or above than the mean. When advisor trust is one standard deviation below the mean, belonging predicted significantly lower burnout, $b = -.42$, $t(519) = -8.13$, $p = < .001$, $\eta_p^2 = .11$, 95% CI [-0.52, -0.32]. When advisor trust is one standard deviation above the mean, belonging had a larger effect in predicting lower burnout, $b = -.61$, $t(519) = -10.69$, $p = < .001$, $\eta_p^2 = .18$, 95% CI [-0.72, -0.49]. Thus, belonging predicted lower burnout at both lower and higher levels of advisor trust, but the effect was larger at higher levels of advisor trust.

Chapter 5

Discussion

The original goal of the paper was to see how belonging affected the relationship between advisor trust and burnout. I expected that both belonging and advisor trust would independently predict burnout. In addition, I predicted that belonging would moderate the association between advisor trust and burnout. As a reminder, I thought that for students with higher levels of belonging, advisor trust would matter less because they already had sufficient belonging to protect against later feelings of burnout. For students with lower levels of belonging, I thought advisor trust would be particularly important, such that higher levels of trust with one's advisor would predict lower burnout, since these students would not benefit from the protective effects of higher belonging.

Results suggest that higher levels of belonging and advisor trust were both associated with lower burnout. These results can be seen in the bivariate correlations (see Table 1). In fact, even when entered together in a multiple regression analysis, both variables continued to have significant negative associations with burnout. At a baseline relationship level, this research reaffirms what has been found in previous literature; that increased belonging seems to be associated with lower burnout. It also shows the relationship that advisor trust is associated with burnout. A potential reason for this trend of belonging is that positive interpersonal relationships help people manage the stress that can lead to burnout. For advisor trust, since the advisor plays such an important role, trusting them, in turn, may help students to feel supported and thus lead

to lower burnout. When I then controlled for covariates, it was found that advisor trust was no longer significant. While advisor trust does seem to have effects on burnout, it may be less effective than other measures at reducing burnout. Compared to belonging which stayed significant even after controlling for covariates, advisor trust may not have effects that are as strong.

There was also a significant interaction between belonging and advisor trust on burnout even when controlling for covariates such as gender, campus, condition, and students' level of burnout earlier in the academic year. That the interaction remains significant controlling for earlier burnout confirms that it is not just something dispositional about people, but rather that advisor trust and belonging in graduate school are important predictors of burnout. Simple effects tests were conducted to understand the pattern of results from the interaction. Results revealed that for students who were high in belonging, advisor trust predicted significantly lower burnout. Although not what I originally predicted, in retrospect, this result makes sense, perhaps, because those who feel like they belong *and* have a solid relationship with their advisor would have both positive effects to help buffer against burnout. For those low in belonging, advisor trust did not predict burnout. A possible explanation for this is that without the effects of belonging, it is hard for advisor trust to have as much of an impact. In fact, belonging significantly predicted lower burnout regardless of students' level of advisor trust.

Originally, I predicted a significant moderation of belonging on advisor trust which was found in my results. However, the pattern was the opposite of what I originally predicted. I had thought that advisor trust would matter less for people high in belonging when it instead mattered more for people high in belonging. For people low in belonging, I also thought advisor

trust would matter more, but results showed that advisor trust mattered less when people were low in belonging. While the original hypothesis is not completely accurate, this research confirms the importance of belonging in graduate school. Where this research takes it further is demonstrating that belonging plays a role in the relationship between advisor trust and burnout. Even for those with high advisor trust, having low belonging reduced the benefit of advisor trust on feelings of burnout. To minimize the effects of burnout, it may be essential to be high in belonging while also being high in advisor trust.

The potential implication of this research is that burnout may be reduced the most for students whom both feel as if they belong in graduate school *and* have high trust in their advisors. While this research did show that advisor trust can play a part in reducing burnout, it did so primarily for students high in belonging. As such, continued development into interventions that make students feel they belong in graduate school seems important. However, this is not to undermine the importance of a positive advisor trust relationship with the student as the research shows that advisor trust predicted lower burnout for students higher in belonging. As such, the advisor should still try to foster an environment where the student feels like they can trust them.

Potential limitations of the study include the fact that the measure of advisor trust only had three items; adding more items may make the measure more accurate. Also, because the measure of advisor trust was created by the research team, the construct may benefit from better psychometric testing and evaluation. Other measures related to advisor trust could also have been incorporated, such as advisor fit, institutional trust, and advisor supervision. These potentially could have been combined with the advisor trust scale to make it more accurate. Another

potential limitation is that these were self-report measures so they may not be as reliable as observational measures.

For strengths, the longitudinal study design provided an ability to measure trust and belonging before burnout which means that while this study is correlational, the relationships can be more plausibly thought to be causal due to temporal precedence. I also controlled for week 3 burnout, campus, and gender to ensure that none of these variables were confounders of the associations of belonging and trust with burnout.

For future research, it could be beneficial to make a broader inclusive measure of advisor trust to have more than 3 items in the scale. As mentioned above in the limitations, this would make the results more accurate. It also may be worth looking into some of the covariates that were controlled for such as gender, campus, and condition. All of these could have impacts on the interaction between belonging, advisor trust, and burnout. Condition is something that especially could be looked at as if we could increase one's belonging, then that could see numerous positive effects when it comes to reducing the effects of burnout. When we controlled for covariates, it was found that the belonging and affirmation condition were significant in reducing burnout. As such, it may be worth continuing to investigate effects of the intervention. Overall, belonging plays a critical part not only for its own effects but also in tandem with advisor trust. Due to the prevalence of burnout within our society today, it is worth continuing to study belonging in hopes to find a way to combat the negative effects of burnout.

Appendix A

Items Used to Measure Each Construct

Academic Belonging

1. I feel like I belong in graduate school.
2. People in my program accept me.
3. I feel like an outsider in grad school. (R)
4. I feel comfortable in grad school classes.
5. I know what I need to do to succeed in grad school.
6. I do not know how to get a professor in my program to like me. (R)
7. People in my program are a lot like me.
8. I am the kind of person that does well in grad school.
9. If I wanted to, I could do very well in grad school.

Burnout

1. I feel emotionally drained from my work.
2. I feel I'm positively influencing other people's lives through my work in grad school.
3. I've become more calloused towards people since I started grad school.
4. I feel burned out about grad school.
5. I have accomplished many worthwhile things in grad school.
6. I worry that grad school is hardening me emotionally.

Advisor Trust

1. I trust my advisor.

2. I am honest with my advisor.

3. Sometimes I am not completely truthful with my advisor. (R)

(R) = Reverse Scored

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ACADEMIC VITA

Kevin Wang

EDUCATION

Pennsylvania State University Schreyer Honors College

May 2023

BS in Psychology, Minor in Kinesiology

- Scholar in Schreyer Honors College
- Scholar in Paterno Fellows Program
 - Liberal Arts honors program emphasizing experiences and courses in leadership, critical thinking, and global awareness

VOLUNTEER EXPERIENCE

Crisis Hotline Operator

March 2022 - Present

Centre Helps, State College PA

- Counseled clients calling about mental health concerns and comforting clients in need of emotional support
- De-escalated clients who were in immediate danger regarding suicide
- Instructed upcoming trainees on policy and procedure on topics including suicide
- Supervised new counselors on the line by helping during calls and providing feedback
- Completed 120 hours of semiweekly training sessions, consisting of role-plays for counseling & basic needs calls
- Brainstormed solutions for clients in need of assistance with shelter, housing, rent, heat, electricity, transportation, and food
- Participated in collaborative discussions on mental health, self-harm, suicide, child abuse, and diversity & inclusion with fellow staff members
- Advocated for a policy change in a staff meeting regarding current clients and future policy

Psi Chi Honor Society

October 2021 - Present

Penn State University

- Selected into the program based on reputable character and academic achievement
- Combated mental health issues during the covid-19 pandemic
- Interacted with respected academics on contemporary psychology disciplines and research

UNDERGRADUATE RESEARCH

Group Identity and Social Perception Lab

December 2020 - Present

Dr. Jonathan Cook

- Record data coding of thousands of participant responses in Microsoft Suite
- Organize confidential transcript information for future data analysis
- Research integral concepts related to ongoing academic experimentation
- Gain foundational knowledge regarding IRB protocol content
- Apply validity concepts to ensure that current research studies are legitimate

THESIS IN PROGRESS

Honors Thesis in Psychology

Schreyer Honors College

- Conducted a study to see how belonging moderates the relationship between advisor trust
- Presented my findings at the PSI CHI conference

LEADERSHIP

Head Coach for PSU League of Legends Division 1 Team

August 2021 - Present

Penn State University

- Coach a top 8 northeastern team for over 300 hours to support their development
- Mediate interpersonal conflict between players
- Conduct data analyses on nearly 100 opposing teams informing gameplay strategies
- Engage professionally and confidentially with players about team issues
- Foster an inclusive and supportive team culture by consistently communicating in an open and safe environment
- Completed Community Service to display good sportsmanship

Music Service Club Social Chair

Fall 2018 - Spring 2020

Penn State University

- Established a community of musicians through different social activities
- Connected with the elderly, disabled, and youth communities through musical performances
- Collaborated with others leading to a performance at THON, the world's largest student-run philanthropy for families with childhood cancer
- Supported others in their musical experiences by providing constructive feedback

AWARDS & RECOGNITIONS

- PSI Chi Honor Society *Fall 2020-Present*
- Dean's List *2019, 2020, 2021*