

# The Relationship Between Psychological Needs Satisfaction and Professional Commitment of Minnesota School-Based Agricultural Education Teachers

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## Abstract

*To address the increasing demand for school-based agriculture education (SBAE) teachers throughout the United States, it is imperative for teachers to remain in the profession. Although the literature has identified several factors influencing SBAE teacher retention, previous research has not examined psychological needs satisfaction. Our study viewed psychological needs through the lens of self-determination theory (Ryan & Deci, 2002), recognizing that the psychological needs of autonomy, competence, and relatedness are universal and innate needs essential for psychological functioning (Ryan & Deci, 2020). Our study aimed to examine if and to what extent psychological needs satisfaction was related to SBAE teachers' professional commitment. One-hundred eighty-one teachers responded to an online questionnaire to gather quantitative data to assess participants' psychological needs satisfaction and professional commitment. We examined the relationship between basic psychological needs satisfaction and professional commitment using correlation, linear regression, independent-sample t-tests, and one-way ANOVA. Our results support earlier research (Collie et al., 2016; Lee & Nie, 2014; Mabekoje et al., 2016) that found people are drawn to needs-satisfying environments. Our most important finding was that psychological needs satisfaction affects SBAE teacher retention as results revealed psychological needs satisfaction of autonomy, competence, and relatedness (independently and collectively) had a significant and negative impact on turnover intention. Our study adds to the evidence that suggests psychological needs satisfaction affects teachers' career choices and provides insight into this relationship in SBAE.*

## Introduction

Teachers must remain in the profession to meet the growing need for school-based agriculture education (SBAE) teachers across the United States. Around 8% of teachers leave the profession each year, with more than two-thirds leaving before retirement age (National Center for Education Statistics, 2018; Sutchter et al., 2016). The top five factors cited by teachers as influencing the decision to leave the teaching profession, other than retirement, were (a) childcare or pregnancy (37%), (b) the pursuit of another career (28%), (c) dissatisfaction with recent school accountability measures (25%), (d) dissatisfaction with the administration (21%), and (e) dissatisfaction with teaching as a career (21%) (Sutchter et al., 2016). Reduced teacher attrition would reduce shortages more than any other factor (Sutchter et al., 2016). Teachers must be physically, psychologically, and emotionally engaged to remain in their roles (Collie et al., 2016; Lee &

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Nie, 2014). Examining teachers' professional commitment is important because it affects both teacher attrition and teacher quality and is essential to deliver high-quality education.

The satisfaction of the basic psychological requirements of autonomy, competence, and relatedness has been proven to be a reliable indicator of teachers' perceptions, particularly their professional commitment (Baard et al., 2004; Collie et al., 2016; Deci et al., 2001; Gagné & Deci, 2005; Lee & Nie, 2014). Humans have an inherent inclination towards psychological growth and development, which results in an increased ability to learn, acquire skills, and build interpersonal relationships (Ryan & Deci, 2002). When examining work environments, the behaviors and outcomes of people are connected to the fulfillment of their psychological needs at work (Deci & Ryan, 2000; Van den Broeck et al., 2010, 2016). In addition, there is a correlation between high attrition rates and inadequate fulfillment of psychological needs (Albrecht & Marty, 2017). Fulfilling teachers' basic psychological needs is crucial for job satisfaction and professional dedication (Lee & Nie, 2014). It is essential to enhance and reinforce these inherent human tendencies. The human mind naturally seeks out environments, such as work environments, that meet its psychological needs and is drawn towards them (Deci & Ryan, 2000, 2002; Van den Broeck et al., 2010, 2016).

Professional commitment predicts teacher turnover, performance, and burnout (Chapman, 1983; Day et al., 2005; Louis, 1998; Raju & Srivastava, 1994; Singh & Billingsley, 1996; Tsui & Cheng, 1999). The professional commitment of SBAE teachers refers to the degree to which individuals identify with their work and acknowledges their dedication to remaining in the SBAE profession (Crutchfield et al., 2013; Gorter, 2018; McKim & Velez, 2015; Moser & McKim, 2020; Sorensen & McKim, 2014). Indicators for strong professional commitment were a favorable work-life balance, dependable contracts with competitive wages, sufficient training for the role, and positive relationships with students, schools, and the community (Igo & Perry, 2019; Moser & McKim). Overall, SBAE teachers who are confident in their work, have connections, and are appropriately compensated are more likely to stay in the profession.

The annual attrition rate of Minnesota SBAE teachers is noteworthy. Of the 381 teachers who started their careers in Minnesota over a 22-year span, 54.5% were still teaching SBAE (Rada & Haddad, 2021). Studies suggest that Minnesota has supported new teachers through induction for decades (Greiman, 2010; Joerger, 2002; Joerger & Boettcher, 2000; Rada, 2022). Minnesota SBAE teachers have a lower annual attrition rate (2.4%; Rada & Haddad, 2021) than the national average (4.5%; Foster et al., 2020) due to this support. Although annual turnover is below the national average, 40% of teachers with less than 10 years of experience left the profession, which is problematic (Rada & Haddad, 2021). More than 33% of Minnesota SBAE teachers with 22 years or less of experience had fewer than four years of SBAE experience (Rada & Haddad, 2021). However, Rada and Haddad (2021) did not investigate the traits of the teachers who continue to work in the field. Because many Minnesota SBAE instructors have five or fewer years of experience and leave at higher rates (Darling-Hammond & Sykes, 2003; Gray et al., 2015; Rada & Haddad, 2021), it was critical to analyze the factors that contribute to SBAE teachers' professional commitment. Our study intended to fill this gap in the literature.

### **Framework**

Self-determination theory (SDT), developed by Deci and Ryan (1985), is a human motivation theory that posits the existence of inherent and instinctive drives for psychological growth and development in every individual. These drives ultimately contribute to the formation of a more intricate and cohesive sense of self (Ryan & Deci, 2002). SDT theorizes that individuals are active organisms in their environment who actively seek personal growth and the integration of their experiences to form a cohesive sense of self (Deci & Ryan, 2000). Human beings' inherent developmental inclinations and psychological requirements necessitate continuous nourishment and assistance to operate optimally. The essence of SDT lies in recognizing the conflicting influences of an individual's innate disposition and the surrounding

environment, which can either facilitate or impede personal growth (Ryan & Deci, 2002). “SDT is concerned not only with the specific nature of positive developmental tendencies, but it also examines social environments that are antagonistic toward these tendencies” (Ryan & Deci, 2000, p. 69). Hence, the relationship between the person and their social environment served as the foundation for insights regarding behavior, experience, and development guided by SDT.

The theoretical framework of SDT promotes psychological needs satisfaction by assessing the factors that drive, enhance, and diminish performance (Deci & Ryan, 1985; Ryan & Deci, 2000). The Basic Psychological Needs Theory (BPNT), a sub-theory of SDT, places emphasis on three fundamental psychological needs—autonomy, competence, and relatedness—which are crucial for human development and motivation (Ryan & Deci, 2002, 2020). *Autonomy* refers to the feeling of taking initiative and responsibility for one’s actions. It is fostered by engaging in activities that are personally interesting and meaningful. *Competence* is a sense of mastery and the belief that one can succeed and develop and is fulfilled through facing appropriate challenges, receiving positive feedback, and having possibilities for personal improvement (Ryan & Deci, 2020). *Relatedness* is a feeling of “belonging and connection” (Ryan & Deci, 2020, p. 1) that is established by the mutual presence of respect, dependence, and concern with individuals and groups. If these three conditions are fulfilled, well-being is maintained and improved; otherwise, individuals suffer psychological setbacks (Chirkov et al., 2003; Deci & Ryan, 2012; Ryan & Deci, 2020). Conditions that facilitate the fulfillment of psychological demands for autonomy, competence, and relatedness positively impact motivation, performance, and perseverance (Deci & Ryan, 1995, 2002, 2012; Ryan & Deci, 2002, 2020; Ryan et al., 2019). Lack of any of these three requirements undermines motivation and dedication.

People evaluate environments based on basic psychological needs support and fulfillment using BPNT. Three basic psychological needs determine whether an environment supports or hinders psychological functioning (Ryan & Deci, 2002). Psychological needs dissatisfaction and poor human functioning arise from environments that fail to meet the fundamental needs (Ryan & Deci, 2002; Vansteenkiste et al., 2020). Psychologically healthy individuals actively pursue the fulfillment of their psychological needs and deliberately select surroundings that fulfill those requirements (Ryan & Deci, 2002). Psychological well-being is enhanced by a social setting that fosters autonomy, competence, and relatedness. Our study examined teachers’ views to evaluate if psychological needs (i.e., the satisfaction of autonomy, competence, and relatedness) affected career drive and persistence (i.e., professional commitment).

### **Purpose and Objectives**

The purpose of our study was to examine if and to what extent psychological needs satisfaction of autonomy, competence, and relatedness were related to SBAE teachers’ professional commitment. The following research questions guided the study:

1. What is the perceived basic psychological need satisfaction (including autonomy, competence, and relatedness collectively and independently) of Minnesota SBAE teachers?
2. What is the perceived professional commitment of Minnesota SBAE teachers?
3. What is the relationship between psychological needs satisfaction (autonomy, competence, and relatedness collectively and independently) and teacher professional commitment?
4. To what extent does number of years teaching SBAE predict SBAE teacher psychological needs satisfaction (including autonomy, competence, and relatedness collectively)?
5. To what extent does number of years teaching SBAE predict SBAE teacher professional commitment?

Methods

Our study applied a quantitative, cross-sectional non-experimental design (Creswell & Creswell, 2018; Jackson, 2015). A census study examined the complete population of Minnesota SBAE instructors actively working in the profession (Johnson & Christensen, 2014). This study was part of a larger study which aimed to ascertain the predictive power of each independent variable on each dependent variable. The most effective approach to explore this link was through a quantitative design. Each participant assessed their need satisfaction and professional dedication using an online questionnaire. A questionnaire collected data from the participants who were SBAE teachers in May 2022 (Creswell & Creswell, 2018; Stockemer, 2019).

Population

Our study’s population was Minnesota SBAE teachers actively teaching as of May 2022 (N = 316). We selected Minnesota SBAE teachers for this census study for three primary reasons: the state’s focus on retention, lower-than-average attrition rate, and considerable growth in the total number of programs and size of programs. All teachers listed on the 2021-2022 Minnesota SBAE teacher directory and actively teaching received an invitation to participate. The directory was available from the Minnesota FFA Association. A potential benefit to this study was that all Minnesota SBAE teachers knew and had worked with the primary researcher because of their state staff role and may have been more willing to participate, resulting in a higher response rate. However, due to their position with Minnesota FFA and the state’s teacher induction and retention programming, there was a potential for response bias.

Demographic data provide an overview of the participants. A total of 181 SBAE teachers participated (57.3%). Among them, 72 were male (39.8%), while 108 were female (59.7%). The average age of participants was 38 years (*SD* = 12.72), ranging from 22 to 76 years. Two-fifths (39.2%) of respondents had fewer than five years of teaching experience, and more than half (56.3%) had less than 10 years of experience. Participants had an average of 12.36 years (*SD* = 11.08) of teaching experience. Of the 181 respondents, more than 65% reported having an agricultural education undergraduate degree (*n* = 118), 8% (*n* = 15) have an agricultural education graduate degree, and an additional 27 respondents (14.9%) have both an undergraduate and graduate agricultural education degree. Most participants (*n* = 160, 88.4%) have an agricultural education undergraduate and/or graduate degree, which led to licensure. The remaining SBAE teacher participants (*n* = 21, 11.6%) have obtained licensure through alternative means. Table 1 provides an analysis of participant gender and licensure pathway, based on years of teaching experience. The data indicates an upward trend toward a greater proportion of alternatively licensed teachers and early-career female teachers in Minnesota.

Table 1

Demographics Summarized by Years of Teaching Experience

Years of Experience	Male		Female		Traditionally Licensed		Alternatively Licensed		
	<i>f</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>
1 – 5 years	70	17	22.9	53	77.1	54	77.1	16	22.9
6 – 10 years	32	10	31.3	21	65.6	28	87.5	4	12.5
11 – 20 years	40	19	47.5	21	52.5	44	97.5	1	2.5
21 – 40 years	36	23	63.9	13	36.1	36	100	0	
More than 41	3	3	100	0		3	100	0	

**Instrumentation**

We created an online questionnaire in Qualtrics to gather quantitative data to assess participants' psychological needs satisfaction and professional commitment using matrix table questions, numerical continuous questions, and multiple-choice questions. The matrix table questions employed Likert-type scales comprising numerous items featuring identical response possibilities (Stockemer, 2019). The questionnaire contained 27 items, which were derived from two established instruments: the Work-related Basic Need Satisfaction Scale (W-BNS; Van den Broeck et al., 2010), used to measure psychological needs satisfaction, and the Michigan Organizational Assessment Questionnaire (MOAQ) Job Satisfaction Subscale (Cammann et al., 1983), used to measure the professional commitment of SBAE teachers. Our study utilized the W-BNS and the MOAQ-JSS to assess the correlation between the fulfillment of psychological needs and teachers' professional commitment.

The W-BNS (Van den Broeck et al., 2010) instrument contained 24 items with three subscales: autonomy satisfaction, competence satisfaction, and relatedness satisfaction. The items were assessed using a five-point Likert-type scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The Autonomy Satisfaction subscale, Competence Satisfaction subscale, and Relatedness Subscale each consisted of six items (Van den Broeck et al., 2010). We duplicated the Relatedness subscale to consider relatedness in both the school district and within the SBAE profession. The subscale typically examines the teacher's role within their present school district, considering the fulfillment of relatedness. The additional duplication in the questionnaire requested participants indicate the degree to which their experiences in the SBAE profession fulfilled their need for relatedness. We assessed the satisfaction of relatedness in the SBAE context by using statements specific to SBAE, such as "Some colleagues in the SBAE profession are close friends of mine." The scores were obtained by summing all the questions and calculating the average score. We determined subscale scores in the same manner.

In the final section, the questionnaire asked participants to indicate their level of commitment to the SBAE profession. The variable being studied, professional commitment, is a continuous variable that was measured using an instrument called MOAQ-JSS (Cammann et al., 1983). MOAQ-JSS includes a subscale that specifically evaluates turnover intention. We assessed professional commitment by measuring the intention to turnover, which is a reliable predictor of actual turnover (Blau, 1985, 1988; Blau & Boal, 1987). The MOAQ-JSS consists of three items that assess an individual's inclination to persist in their present employment (Cammann et al., 1983) using a seven-point Likert-type scale.

An expert panel of SBAE professors, instrument authors, and scholars ( $n = 7$ ) examined the 27-item online questionnaire for face and content validity. The panelists were chosen because of their research expertise related to psychological functioning of teachers and/or teacher retention. For a pilot group, we recruited 177 teachers from states with similar SBAE structure and geographic locations as Minnesota. We aimed for a minimum of 20 participants (DeVellis, 2017). With 50 SBAE teachers completing the pilot questionnaire administered online through Qualtrics via an email invitation, the pilot test screened items for appropriateness, validity, and internal consistency (Hair et al., 2014).

**Data Collection**

The Dillman Tailored Design Method (Dillman et al., 2014) guided data collection. In May 2022, we sent a personalized letter and an online Qualtrics questionnaire to the target demographic for the census. Every interaction with the respondents was personalized, with a maximum of four contacts made. Each teacher received messages at different times and on different days of the week (Dillman et al., 2014). We chose a non-experimental survey to gather perceptions from a large population at a specific moment in time (Creswell & Creswell, 2018).

To reduce participant fatigue, we grouped items to minimize the number of pages required for navigation. The questionnaire included 27 validated items derived from two instruments and 22

demographic items. We estimated it would take around 10 minutes to complete the questionnaire based on the pilot test (Revilla & Ochoa, 2017). The response options were constrained to five or seven balanced categories to enhance the reliability and validity of the data and facilitate significant distinctions for analysis (Dillman et al., 2014). We tested the questionnaire on both a computer and a smartphone to confirm its compatibility with mobile devices (Dillman et al., 2014). We opened the survey for four weeks, during which time we sent weekly email reminders to individuals to increase the response rate (Dillman et al., 2014).

### **Data Analysis**

We screened and uploaded our data from Qualtrics to SPSS Version 27 to analyze our data. Before calculating total scores, we inspected the frequencies of each variable, and any inaccuracies or deviated values were rectified (Pallant, 2020). We also looked for “extreme or outlier cases, significant predictors, significant results relating variables, insignificant predictors, or even demographics” (Creswell & Creswell, 2018, p. 222).

We analyzed the instrument’s reliability and the reliability of each summated scale to determine its suitability for the study. We used post-hoc analysis to examine the summated scale and subscales to evaluate the consistency or stability level over numerous variable measurements (Hair et al., 2014; Johnson & Christensen, 2014). The Cronbach alpha coefficients obtained for autonomy satisfaction (.77), competence satisfaction (.80), relatedness satisfaction in their school district (.87), and relatedness satisfaction within SBAE (.89) indicated satisfactory levels of reliability. The results align with the psychometric properties identified by Van den Broeck et al. (2010). The Cronbach alpha provides evidence that each of the W-BNS subscales is unidimensional when assessing autonomy, competence, and relatedness satisfaction. Furthermore, the entire instrument is unidimensional in measuring the overall satisfaction of psychological needs. The Cronbach alpha also exhibited satisfactory reliability in measuring overall satisfaction of psychological demands. The MOAQ-JSS (Cammann et al., 1983) scale demonstrated acceptable internal consistency reliability with a coefficient of .89. Konovsky and Cropanzano (1991) and Shore et al. (1990) also reported high reliability (.84).

We used independent samples t-tests on early and late responders to examine the presence of nonresponse bias (Miller & Smith, 1983). Our results (see Table 2) compared early respondents (n = 135), who responded before the third email, with late respondents (n = 46), who responded after the third email, in terms of the independent and dependent variables. To safeguard the external validity and generalizability of the findings, we conducted a two-tailed independent t-test at the .05 alpha level to address the potential impact of nonresponse. In general, the test’s power ranged from .0 to 0.20, showing a negligible to small influence for each variable, suggesting the findings can be applied to the population (Cohen, 1988). We found no notable disparities between early- and late-respondents in evaluating the independent and dependent variables. As a result, the conclusions drawn from the study can be applied to the entire population (Johnson & Shoulders, 2017; Lindner et al., 2001; Miller & Smith, 1983).

**Table 2***Independent Samples t-Test of Early and Late Respondents to Test for Nonresponse Bias*

Variable	Early Respondents			Late Respondents			95% CI	<i>t</i>	<i>p</i>	Cohen's <i>d</i>
	<i>f</i>	<i>M</i>	<i>SD</i>	<i>f</i>	<i>M</i>	<i>SD</i>				
Autonomy <sup>a</sup>	135	3.46	.68	46	3.55	.64	-.31, .14	-.75	.45	-.13
Competence <sup>b</sup>	135	4.10	.63	46	4.21	.48	-.32, .08	-1.18	.24	-.20
Relatedness <sup>c</sup>	135	3.70	.92	46	3.78	.78	-.38, .22	-.55	.59	-.09
SBAE Relatedness <sup>d</sup>	135	3.95	.84	46	3.89	.85	-.23, .34	.38	.71	.07
Psychological Needs Satisfaction <sup>e</sup>	135	3.75	.55	46	3.85	.49	-.28, .08	-1.06	.30	-.18
Turnover Intention <sup>f</sup>	135	3.13	1.74	46	2.97	1.67	-.43, .74	.53	.60	.09

<sup>a b c d e</sup> 5-point scale (1 = strongly disagree, 5 = strongly agree)

<sup>f</sup> 7-point scale (1 = strongly disagree, 4 = neither agree nor disagree, 7 = strongly agree)

\**p* < .05. \*\**p* < .01

We examined data for normality by evaluating skewness and kurtosis values. Our kurtosis values (ranging from -.66 to .43) and skewness values (ranging from -.78 to .99) fell within acceptable ranges (Garson, 2012), indicating that the variables (i.e., autonomy satisfaction, competence satisfaction, relatedness satisfaction in their school district and within the SBAE profession, psychological need satisfaction, professional commitment measured by turnover intention, years teaching SBAE) were normally distributed (see Table 3) and classified as approximately normal.

**Table 3***Descriptive Statistics for the Variables of Interest*

Variable	<i>f</i>	<i>M</i>	<i>SD</i>	Skewness	Std. Error	Kurtosis	Std. Error
Autonomy	181	3.48	.67	-.05	.18	-.59	.36
Competence	181	4.13	.59	-.78	.18	.43	.36
Relatedness	181	3.72	.89	-.45	.18	-.64	.36
Relatedness in SBAE	181	3.94	.84	-.48	.18	-.56	.36
Psychological Needs Satisfaction	181	3.76	.53	-.10	.18	-.60	.36
Turnover Intention	181	3.09	1.72	.54	.18	-.66	.36
Years Teaching	181	12.36	11.08	.99	.18	.32	.36

## Findings

### Research Question One: Perceived Basic Psychological Need Satisfaction

To answer research question one, the descriptive statistics of the independent and dependent variables are shown in Table 4. We interpreted the W-BNS scale analysis using mean scores of *strongly disagree* (1 – 1.49), *somewhat disagree* (1.5 – 2.49), *neither agree nor disagree* (2.5 – 3.49), *somewhat agree* (3.5 – 4.49), and *strongly agree* (4.5 – 5).

The results illustrate that respondents tended to slightly agree that their basic psychological needs (collectively and individually) were being met. Participants indicated the highest mean score for

competence satisfaction and the lowest for autonomy satisfaction. The responses exhibited the greatest variation in terms of relatedness in the school district and relatedness in the SBAE profession. In addition, none of the respondents had a mean score of 1.00, indicating that each respondent experienced some level of psychological needs satisfaction. However, certain respondents did have a mean score of 5.00, indicating a strong agreement with every statement regarding their satisfaction of psychological needs.

**Table 4***Frequency Counts of Independent Variables by Mean Score*

Mean Score	Psychological Needs Satisfaction		Autonomy		Competence		Relatedness		SBAE Relatedness	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
1.00-1.99	0	-	0	-	0	-	6	3.3	1	.6
2.00-2.99	13	7.2	42	23.2	10	5.5	35	19.3	24	13.3
3.00-3.99	98	54.1	89	49.2	47	26.0	53	29.3	58	32.0
4.00-4.99	69	38.1	49	27.1	110	60.8	75	41.4	67	37.0
5.00	1	.6	1	.6	14	7.7	12	6.6	31	17.1

*Note.* The W-BNS scale anchors are strongly disagree (1), somewhat disagree (2), neither agree nor disagree (3), somewhat agree (4), and strongly agree (5).

***Basic Psychological Needs Satisfaction***

Of the 181 respondents, basic psychological need satisfaction mean scores of respondents ranged from 2.44 to 5.00, with an overall mean of 3.78 ( $SD = .53$ ), which suggests that respondents somewhat agree that SBAE teachers' basic psychological needs are being fulfilled in the workplace. Thirteen of the 181 respondents (7.2%) somewhat or strongly disagree that their basic psychological needs are fulfilled in their workplace (see Table 4).

***Perceived Need Satisfaction of Autonomy***

Of the 181 respondents, autonomy need satisfaction scores ranged from 2.00 to 5.00, with a mean score of 3.48 ( $SD = .67$ ; see Table 5). Of the 181 respondents, 23.2% ( $n = 42$ ) somewhat disagreed and 27.1% ( $n = 49$ ) somewhat agreed that their need for autonomy was fulfilled in their workplace (see Table 4).

***Perceived Need Satisfaction of Competence***

The lowest mean score for competence satisfaction was 2.17, while the maximum score was 5.00. The mean score for the subscale of 4.13 ( $SD = .59$ ) indicates that respondents somewhat agree that their workplace fulfills their competence need (see Table 5). Also, 68.5% of the respondents somewhat agree or strongly agree with a score of 4.0 or higher (see Table 4).

**Table 5***Descriptive Statistics of Independent and Dependent Variables*

Variable	<i>f</i>	Mean	Min	Max	<i>SD</i>
Psychological Needs Satisfaction	181	3.78	2.44	5.00	.53
Autonomy	181	3.48	2.00	5.00	.67
Competence	181	4.13	2.17	5.00	.59
Relatedness	181	3.72	1.33	5.00	.89
SBAE Relatedness	181	3.94	1.50	5.00	.84
Turnover Intention	181	3.09	1.00	7.00	1.72

*Note.* The W-BNS scale scores are strongly disagree (1), somewhat disagree (2), neither agree nor disagree (3), somewhat agree (4), and strongly agree (5). MOAQ-JSS is a 7-point Likert scale consisting of the following responses: strongly disagree (1), disagree (2), slightly disagree (3), neither agree nor disagree (4), slightly agree (5), agree (6), and strongly agree (7).

**Perceived Need Satisfaction of Relatedness**

We evaluated the relatedness need satisfaction variable in the context of both the district and the SBAE profession. District relatedness need satisfaction ranged from 1.33 to 5.00, with a mean score of 3.72 ( $SD = .89$ ) for the sub-scale (see Table 5), which we interpreted as the respondents somewhat agreeing that relatedness satisfaction is being fulfilled in their district.

When evaluating relatedness in the context of the SBAE profession, the lowest mean score was 1.5, the highest was 5.00, and the mean score was 3.94 ( $SD = .84$ ; see Table 5), which indicates the respondents somewhat agree that relatedness satisfaction is being fulfilled in the SBAE profession. Unlike other variables, 31 respondents had a 5.0 score (17.1%) of strongly agree when evaluating relatedness within the SBAE profession (see Table 4).

**Research Question Two: Perceived Professional Commitment**

To address research question two, we measured professional commitment using a MOAQ-JSS turnover intention subscale. Professional commitment, indicated by turnover intention, ranged from 1.00 to 7.00, with a mean score of 3.09 ( $SD = 1.72$ ; see Table 5). Of the 181 respondents, 92 had low turnover intentions (50.8%), 76 were neutral (42.0%), and 13 had high intentions (7.2%). Most (50.8%) had turnover intentions below 3.0, indicating high commitment.

**Research Question Three: Relationship Between Psychological Needs Satisfaction and Teacher Professional Commitment**

We examined the relationship between basic psychological needs satisfaction and professional commitment using correlation, linear regression, independent-sample t-tests, and one-way ANOVA to answer research question three. We used the Pearson product-moment correlation coefficient to analyze the relationship between basic psychological needs satisfaction (W-BNS) and professional commitment (MOAQ JSS turnover intention). We found a medium, negative correlation [ $r = -.49$ ,  $n = 181$ ,  $p < .01$ ], with high psychological needs satisfaction levels associated with lower levels of turnover intention (see Table 6).

There was a negative correlation between each psychological need and professional commitment measured by turnover intention. There was a strong, negative correlation between the two variables [ $r = -.57$ ,  $n = 181$ ,  $p < .01$ ], with high autonomy satisfaction levels associated with lower levels of turnover intention (see Table 6). There was a medium, negative correlation between the two variables [ $r = -.38$ ,  $n = 181$ ,  $p < .01$ ], with high competence satisfaction levels associated with lower levels of turnover intention (see Table 6). There was a small, negative correlation between relatedness within the school district and turnover intention [ $r = -.20$ ,  $n = 181$ ,  $p < .01$ ], with high relatedness satisfaction levels associated with lower

levels of turnover intention (see Table 6). There was also a small, negative correlation between relatedness within SBAE and turnover intention [ $r = -.19, n = 181, p < .05$ ], with high relatedness satisfaction levels associated with lower levels of turnover intention (see Table 6).

**Table 6**

*Means, Standard Deviations, and Correlations Among Variables*

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6
1. Autonomy Satisfaction	3.48	.67	-					
2. Competence Satisfaction	4.13	.59	.40**	-				
3. Relatedness Satisfaction	3.72	.89	.40**	.17*	-			
4. Relatedness Satisfaction in SBAE Profession	3.94	.84	.22**	.27**	.36**	-		
5. Psychological Needs Satisfaction	3.78	.53	.79**	.63**	.79**	.39**	-	
6. Years of Experience	12.36	11.08	.24**	.45**	.01	.11	.28**	
7. Turnover Intention	3.09	1.72	-.57**	-.38**	-.20**	-.19*	-.49**	-.21**

\* $p < .05$ . \*\* $p < .01$

#### **Research Question Four: Years Teaching SBAE and Psychological Needs Satisfaction**

We analyzed the relationship between psychological needs satisfaction and professional commitment to address research question four. Once descriptive statistics were analyzed, the relationship between psychological needs satisfaction and professional commitment was examined using correlation, independent-samples t-tests, and one-way ANOVA.

#### **Correlation**

The relationship between psychological needs satisfaction (as measured by the W-BNS scale) and professional commitment (measured as turnover intention by the MOAQ-JSS) was examined using Pearson product-moment correlation coefficient. There was a small, positive correlation between the two variables [ $r = .28, n = 181, p < .01$ ], with more years of experience associated with higher levels of psychological needs satisfaction (see Table 6).

To control for demographic and professional characteristics statistically, the control variables of gender, years teaching, age, and certification type were entered as block one in the hierarchical regression analysis (HRA). This group of variables described 2% ( $R^2 = .02$ ) of the variance in professional commitment as measured by turnover intention. Block two involved the addition of autonomy satisfaction, competence satisfaction, and relatedness satisfaction in the school district, and theory supported our decision BNS (Van den Broeck, personal communication, October 20, 2020). Adding the variables of satisfaction of autonomy, competence, and relatedness in the school district resulted in an additional 31% ( $\Delta R^2 = .31$ ) of the variance being explained. The full model, including relatedness satisfaction in the school district, explained 33% of the variance in professional commitment (see table 7).

**Table 7**

*Hierarchical Regression Analysis of Variables Including Relatedness in the School District Predicting Professional Commitment*

Variable	B	SE	$\beta$	p	R <sup>2</sup>	$\Delta R^2$
Step 1 (control variables)					.05	.02
Gender	-.08	.27	-.02	.78		
Years Teaching	-.03	.02	-.16	.29		
Age	-.01	.02	-.07	.65		
Certification Type	-.01	.07	-.01	.93		
Step 2					.36**	.33**
Gender	-.05	.22	-.02	.82		
Years Teaching	-.00	.02	-.02	.89		
Age	.00	.02	.03	.82		
Certification Type	.05	.06	.05	.46		
Autonomy	-1.33	.19	-.52	.01**		
Competence	-.52	.21	-.18	.01*		
Relatedness in School District	-.06	.13	-.03	.64		

\*p < .05. \*\*p < .01

The HRA was duplicated, replacing relatedness satisfaction in the school district with relatedness satisfaction in the SBAE profession, and theory supported our decision BNS (Van den Broeck, personal communication, October 20, 2020). Block two involved the addition of autonomy satisfaction, competence satisfaction, and relatedness satisfaction in the SBAE profession, and theory supported our decision BNS (Van den Broeck, personal communication, October 20, 2020). Adding the variables of satisfaction of autonomy, competence, and relatedness in the SBAE profession resulted in an additional 31% ( $\Delta R^2 = .31$ ) of the variance being explained, and results are shown in Table 8. The full model, including relatedness satisfaction in the SBAE profession, explained 33% of the variance in professional commitment. The coefficient  $\beta$  for psychological needs satisfaction is not equal to zero. Therefore, it was deemed statistically significant.

**Table 8**

*Hierarchical Regression Analysis of Variables Including Relatedness in the SBAE Profession Predicting Professional Commitment*

Variable	B	SE	$\beta$	p	R <sup>2</sup>	$\Delta R^2$
Step 1 (control variables)					.05	.02
Gender	-.08	.27	-.02	.78		
Years Teaching	-.03	.02	-.16	.29		
Age	-.01	.02	-.07	.65		
Certification Type	-.01	.07	-.01	.93		
Step 2					.36**	.33**
Gender	-.06	.22	-.02	.80		
Years Teaching	-.00	.02	-.02	.88		
Age	.00	.02	.02	.85		
Certification Type	.04	.06	.05	.49		
Autonomy	-1.28	.18	-.50	.01**		
Competence	-.50	.21	-.17	.02*		
Relatedness in SBAE Profession	-.05	.13	-.02	.73		

\*p < .05. \*\*p < .01

### *t*-Tests Considering More and Less than Five Years of Experience

An independent-samples *t*-test was conducted to compare the scores for autonomy satisfaction, competence satisfaction, relatedness satisfaction in the school district and in the SBAE profession, and psychological needs satisfaction for teachers with five or fewer years of teaching and teachers with more than five years teaching. When assessing competence satisfaction, there was a statistically significant difference in scores for teachers with five or fewer years teaching ( $M=3.91$ ,  $SD=.60$ ) and teachers with more than five years ( $M=4.26$ ,  $SD=.55$ ). Additionally, when evaluating overall psychological needs satisfaction, a statistically significant difference existed in scores for teachers with five or fewer years teaching ( $M=3.66$ ,  $SD=.50$ ) and teachers with more than five years ( $M=3.85$ ,  $SD=.54$ ). When assessing autonomy and relatedness satisfaction in each context, there was no significant difference in scores for teachers with five or fewer years teaching and teachers with more than five years (see Table 9).

**Table 9**

#### *Independent Samples t Test Comparing Independent Variables and Years Teaching*

Variable	5 or Fewer Years			More than 5 Years			95% CI	<i>t</i>	<i>df</i>
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>			
Autonomy	70	3.38	.66	111	3.55	.67	-.38, .03	-1.70	179
Competence	70	3.91	.60	111	4.26	.55	-.52, -.17	-3.96	179
Relatedness	70	3.70	.83	111	3.73	.93	-.29, .24	-.179	179
SBAE Relatedness	70	3.78	.85	111	4.03	.83	-.50, .00	-1.95	179
Psychological Needs Satisfaction	70	3.66	.50	111	3.85	.54	-.34, -.02	-2.24	179
Turnover Intention	70	3.13	1.76	111	3.06	1.70	-.44, .60	.29	179

### *ANOVA*

An ANOVA was conducted to explore the impact of years of experience on autonomy satisfaction, competence satisfaction, relatedness satisfaction, relatedness satisfaction within the SBAE profession, and psychological needs satisfaction as measured by W-BNS total. To help characterize the career experiences of participants, Huberman's (1989) model of the professional life cycle of teachers was used to group participants based on years teaching (Group 1: 0-3 years; Group 2: 4-6 years; Group 3: 7-18 years; Group 4: 19-30 years; Group 5: more than 31 years).

A one-way ANOVA of variables by grouped years of experience at a significance level of .05 or less is shown in Table 10, comparing the means and standard deviations for each variable by group. When considering autonomy satisfaction, there was a statistically significant difference between groups as determined by one-way ANOVA ( $F(4,175) = 4.52$ ,  $p = .01$ ). Additionally, a large effect size, calculated using eta squared, was .09 (Cohen, 1988). A Tukey post hoc test revealed that years teaching SBAE was statistically significant for autonomy needs satisfaction when comparing group one (0-3 years;  $M=3.34$ ,  $SD = .62$ ) and group three (7-18 years;  $M=3.37$ ,  $SD = .64$ ) to five (more than 31 years;  $M=4.04$ ,  $SD = .73$ ). There was no statistically significant difference between the remaining groups.

Table 10

Mean, Standard Deviation, and Post Hoc One-Way Analyses of Variance Multiple Comparisons for Years Teaching SBAE and Psychological Needs Satisfaction and Turnover Intention

Measure	1 – 3 Years (n=55)		4 – 6 Years (n=20)		7 – 18 Years (n=58)		19 – 30 Years (n=32)		31 – 40 Years (n=16)		F	$\eta^2$
	M	SD	M	SD	M	SD	M	SD	M	SD		
Autonomy	3.34	.62	3.67	.79	3.37	.64	3.54	.57	4.04	.73	4.52**	.09
Competence	3.85	.61	4.11	.51	4.09	.59	4.38	.46	4.66	.38	8.76**	.17
Relatedness	3.69	.80	3.88	.91	3.60	.99	3.76	.85	3.90	.83	.61	.01
SBAE Relatedness	3.82	.83	3.81	.89	3.97	.83	3.99	.89	4.19	.72	.79	.02
Psychological Needs	3.63	.46	3.91	.59	3.68	.55	3.89	.49	4.20	.48	5.08**	.10
Turnover Intention	3.08	1.79	3.25	1.60	3.53	1.73	2.78	1.48	2.02	1.72	2.93*	.06

Note. Years teaching groups (Group 1: 0-3 years; Group 2: 4-6 years; Group 3: 7-18 years; Group 4: 19-30 years; Group 5: more than 31 years)

\* $p < .05$ . \*\* $p < .01$

When considering competence satisfaction, there was a statistically significant difference between groups as determined by one-way ANOVA ( $F(4,176) = 4.52, p = .01$ ). Additionally, a large effect size, calculated using eta squared, was .17 (Cohen, 1988). A Tukey post hoc test revealed that years teaching SBAE was statistically significant for competence needs satisfaction when comparing group one (0-3 years;  $M=3.85, SD=.61$ ), group two (4-6 years;  $M=4.11, SD=.51$ ) and group three (7-18 years;  $M=4.09, SD=.59$ ) to five (more than 31 years;  $M=4.66, SD=.38$ ). Group one (0-3 years;  $M=3.85, SD=.61$ ) was significantly different than group four (19-30 years;  $M=4.38, SD=.46$ ). There was no statistically significant difference between the remaining groups.

When considering relatedness satisfaction in the school district, there was no statistically significant difference between groups as determined by one-way ANOVA ( $F(4,176) = .61, p = .65$ ). When considering relatedness satisfaction in the SBAE profession, there was no statistically significant difference between groups as determined by one-way ANOVA ( $F(4,176) = .79, p = .53$ ). A small effect size was calculated for each comparison (Cohen, 1988).

When considering psychological needs satisfaction, there was a statistically significant difference between groups as determined by one-way ANOVA ( $F(4,175) = 5.08, p = .01$ ). Additionally, a large effect size, calculated using eta squared, was .10 (Cohen, 1988). A Tukey post hoc test revealed that years teaching SBAE was statistically significant for psychological needs satisfaction when comparing group one (0-3 years;  $M=3.63, SD=.46$ ) and group three (7-18 years;  $M=3.68, SD=.55$ ) to five (more than 31 years;  $M=4.20, SD=.48$ ). There was no statistically significant difference between the remaining groups.

An ANOVA was also conducted to explore the impact of years of experience on professional commitment. When considering professional commitment as measured by turnover intention, there was a statistically significant difference between groups as determined by one-way ANOVA ( $F(4,176) = 2.93, p = .02$ ). Additionally, a medium effect size, calculated using eta squared, was .06 (Cohen, 1988). A Tukey post hoc test revealed that years teaching SBAE was statistically significant for turnover intention when comparing group three (7-18 years;  $M=3.53, SD=1.73$ ) to five (more than 31 years;  $M=2.02, SD=1.72$ ). There was no statistically significant difference between the remaining groups.

**Research Question Five: Years Teaching SBAE and Professional Commitment**

To test research question five, the relationship between years teaching SBAE and professional commitment (measured as turnover intention by the MOAQ-JSS) was examined using Pearson product-moment correlation coefficient. There was a small, negative correlation between the two variables [ $r = -.21, n = 181, p < .01$ ], with more years of experience associated with lower levels of turnover intention (see Table 6). A one-way ANOVA of variables grouped by years of experience at a significance level of .05 or less showed no statistically significant difference between any groups.

**Conclusions and Discussion**

According to SDT (Ryan & Deci, 2002), the psychological demands of autonomy, competence, and relatedness are universal, innate, and required for psychological functioning (Ryan & Deci, 2020). People are drawn to surroundings that create needs fulfillment, which influences attitudes and behaviors (Collie et al., 2016; Lee & Nie, 2014; Mabekoje et al., 2016). Basic psychological needs are crucial for teachers' job satisfaction and professional commitment (Collie et al., 2016; Lee & Nie, 2014). The relationship between psychological needs satisfaction and teacher professional commitment (Lee & Nie, 2014; Mabekoje et al., 2016), and the need to identify factors affecting Minnesota SBAE teacher retention necessitated an investigation.

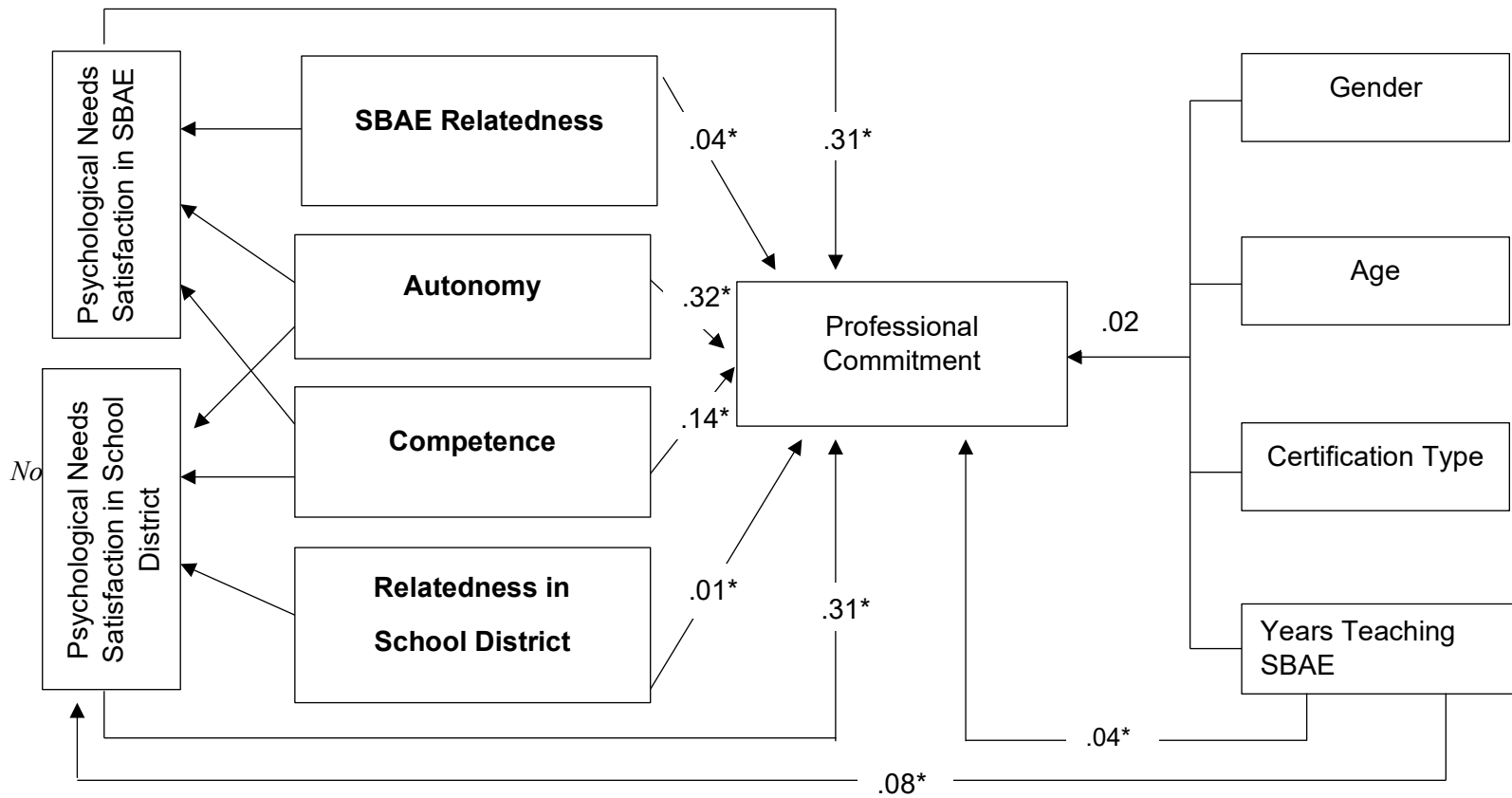
Anchored by the conceptual understanding of SDT, our study aimed to examine if and to what extent psychological needs satisfaction were related to and could predict teachers' professional commitment. The obtained results reveal the relationships expected among variables (see Figure 1) with autonomy, competence, relatedness in the school district, and relatedness in the SBAE profession predicting SBAE teachers' professional commitment. The findings of our study affirm that psychological needs satisfaction are related to and are statistically significant predictors of Minnesota SBAE teachers' professional commitment.

Collectively, psychological need satisfaction in the school district (i.e., autonomy satisfaction, competence satisfaction, and relatedness in the school district satisfaction) has a negative and significant effect on SBAE teachers' turnover intention ( $\Delta R^2 = .31$ ), resulting in a positive impact on professional commitment. Additionally, psychological need satisfaction in the SBAE profession has a negative and significant effect on SBAE teachers' turnover intention ( $\Delta R^2 = .31$ ), resulting in a positive impact on professional commitment. The data also suggest that competence and autonomy are the most statistically significant predictors of professional commitment.

The results examining needs satisfaction independently reveal each has a negative and significant effect on turnover intention (autonomy  $\Delta R^2 = .32$ ; competence  $\Delta R^2 = .14$ ; relatedness in the school district  $\Delta R^2 = .01$ ; relatedness in the SBAE profession  $\Delta R^2 = .04$ ). This suggests that SBAE teachers with perceived psychological need satisfaction have increased professional commitment. Finally, the results examining years teaching SBAE reveal a negative and significant effect on psychological needs satisfaction ( $\Delta R^2 = .08$ ) and turnover intention ( $\Delta R^2 = .04$ ).

Figure 1

Relationship Among Psychological Needs Satisfaction, Professional Commitment, and Teacher Demographic Variables as Determined by Regression Analysis



Psychological needs satisfaction may differ individually; however, each research question revealed important information about the professional commitment characteristics of Minnesota SBAE teachers. Our results support earlier research (Collie et al., 2016; Lee & Nie, 2014; Mabekoje et al., 2016) that found people are drawn to needs-satisfying environments, needs satisfaction influences beliefs and behaviors, and psychological needs fulfillment influences teachers' intentions to stay in the profession. With a mean score of 3.78 ( $SD = .53$ ), Minnesota SBAE teachers somewhat agreed that workplace psychological needs were addressed. Competence had the highest mean score of 4.13 ( $SD = .59$ ) of the three psychological needs, indicating participants somewhat agree that their competence psychological need is met. Respondents somewhat agreed that their need for relatedness in the SBAE profession is met with a mean of 3.94 ( $SD = .84$ ) and in the school district at 3.72 ( $SD = .89$ ). Respondents neither agreed nor disagreed if their psychological demand for autonomy was met at work, with a mean score of 3.48 ( $SD = .67$ ).

We measured professional commitment by turnover intention, which averaged 3.09 ( $SD = 1.72$ ), suggesting neutral turnover intention. These data also show a statistically significant and positive correlation between increased years teaching SBAE and psychological needs satisfaction. Increased years teaching SBAE also have a significant and negative correlation with turnover intention. Our most important finding was that psychological needs satisfaction affects SBAE teacher retention as results revealed psychological needs satisfaction of autonomy, competence, and relatedness (independently and collectively) had a statistically significant and negative impact on turnover intention. Our study adds to the evidence that psychological needs satisfaction affects teachers' career choices and provides insight into this relationship in SBAE.

### **Recommendations**

Minnesota SBAE teacher retention depends, in part, on meeting teachers' psychological needs. Our findings indicate that psychological need fulfillment at work is correlated with professional commitment. Our findings reflect previous studies indicating a need-satisfying work environment for teachers increases psychological health and commitment (Collie et al., 2016; Lee & Nie, 2014; Mabekoje et al., 2016). Professional commitment is strongly influenced by instructors' psychological needs at work.

Our research shows that Minnesota's SBAE teacher demographics are changing. SBAE literature has investigated the shift to having more female SBAE teachers under the age of 40, which aligned with the findings of this study, and the stress and job satisfaction levels concerning work-life balance (Hainline et al., 2015; Solomonson & Retallick, 2018; Sorensen & McKim, 2014). These data also show an increasing number of teachers without an agricultural education degree. The psychological needs satisfaction of SBAE teachers exploring the influence of gender, age, years of teaching experience, and licensure pathway warrants further research and discussion to explore how each factor influences psychological need satisfaction and what supports need fulfillment. Due to varying teacher characteristics, findings beyond our study warrant further study to see the implications explicitly related to teacher characteristics.

A limitation of our study is that it does not offer additional understanding of the distinct experiences of each SBAE teacher. Including a mixed methods approach with a qualitative component could have further expanded upon the quantitative results. Additionally, responses from 181 SBAE teachers ( $n=181$ ; 57.3%) were usable in this study but may affect the generalizability of the results. Finally, our study was carried out towards the conclusion of the 2021-2022 academic year. Exploration should be conducted to examine how the time of the year can potentially alter perceptions of needs satisfaction and turnover intention.

Autonomy satisfaction significantly impacted SBAE teacher turnover intention. Previous studies found that autonomy satisfaction predicted teachers' psychological well-being (Collie et al., 2016; Deci et al., 2001; Nie et al., 2015; Taylor & Ntoumanis, 2007). Education leaders in Minnesota may foster an

autonomy-supportive climate to retain SBAE teachers. Research should explore what SBAE teachers desire in terms of autonomy, if specific SBAE professional development programs (e.g., Teacher Induction Program) influence autonomy satisfaction, or if there a difference in autonomy expectations based on certification type? More research is needed to fully explore how to best support SBAE teacher autonomy satisfaction.

The Minnesota Association of Agriculture Educators, Department of Education, and the Minnesota FFA Association have collaborated to support SBAE discipline-specific skill professional development. Teachers are encouraged to participate to build competence and knowledge due to the strong association between competence fulfillment and SBAE teachers' professional commitment. Administrators can also encourage and support SBAE instructors' participation in professional development to increase competency and reduce turnover. Finally, SBAE leaders should continue offering competence-based professional development. Given teacher differences and the significance of competence need satisfaction, it is advised that Minnesota SBAE leadership assess teacher needs to evaluate perceived competence and research the impact of professional development, considering certification type and years teaching SBAE.

District relatedness was a strong predictor of professional commitment (Moser & McKim, 2020), but we found it was not the most crucial factor. SBAE teachers often highlighted the "Ag Ed family" as a reason they continue teaching (Moser & McKim, 2020). However, we found a substantial but negligible negative correlation between SBAE profession relatedness and turnover intention. When the Ag Ed family is mentioned, it is often in the context of providing reasons to engage in the profession, join the professional organization, and participate in SBAE-relevant professional development. Organization membership and participation in professional development is often a key step to professional engagement in SBAE. Therefore, it is logical that those participating in SBAE-relevant professional development are simultaneously improving relatedness fulfillment in the SBAE profession while also improving their competence. SBAE leaders should acknowledge that they can meet psychological needs for relatedness and competence. We encourage SBAE leaders to intentionally provide options to develop the knowledge and skills of SBAE teachers while also supporting relationship development.

This study laid the groundwork for examining how psychological needs satisfaction impacts turnover intention and professional commitment. Further research is needed to determine SBAE factors that affect autonomy, competence, and relatedness satisfaction in the school district and profession. This study was a snapshot, but replication would provide more information on the relationship. Since 39.2% of our study's participants had five or fewer years teaching SBAE and 17.1% had six to ten years, a replication of our study could shed light on the factors that affect turnover intention and actual attrition during a critical career phase.

The study's results establish that psychological needs fulfillment of SBAE teachers at work is a reliable predictor of professional commitment. People are drawn to environments that support psychological needs satisfaction, which influences beliefs and behaviors such as the intention to remain in the profession. The data establish that, when measured by turnover intention, professional commitment of SBAE teachers is supported by psychological needs satisfaction., and most strongly predicted by satisfaction of autonomy and competence needs. The findings also affirm that increased psychological needs satisfaction and professional commitment were connected to years of teaching experience.

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