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Undergraduate Project Team Satisfaction: Analysis of a Theoretically Derived Structural Model

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Abstract

Research and societal trends indicate the necessity and permanency of teamwork skills in the workplace thus investigating the relationship between satisfaction and students' experiences of team and group work is essential. Taking a novel and comprehensive approach the current research study examined the effect of multiple antecedent conditions on undergraduate project team satisfaction. Specifically, a structural model was proposed and tested to examine the effects of clarity, justice, frustration, and fit on project team satisfaction. The model was able to predict 52.7% of the variance associated with project team satisfaction. Among the predictor variables clarity had the largest total (direct and indirect) effect on satisfaction. Frustration was found to have the next largest total effect. Consequently, agricultural educators are encouraged to first focus on clearly articulating the expectations associated with project teams as well as to monitor project teams for emerging frustration and to intervene as appropriate.

Keywords: team satisfaction; teamwork; undergraduate; clarity; justice; frustration; project team fit

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Introduction

"Meaningful learning should engage the learner...not just [see them solely] as the recipient of knowledge" (Edgar et al., 2016, p. 38). Engaging students in the process of their own classroom education is often accomplished in the form of team and group project work. This type of teamwork relates to structured activities that promote interdependence, accountability, and shared goals (Weinstein et al., 2013). Scholars have highlighted the importance of students engaging in their own construction of knowledge along with the argument that students cannot adequately learn a new skill or concept without the assistance of an educator or peers (Ku et al., 2013; Oakley et al., 2007). Agricultural educators are among the many instructors who ask students to participate in team initiatives to complete project work, identifying it as an effective teaching method (Miller & Polito, 1999). Researchers and practitioners generally agree on team dynamics involving Tuckman's group development stages (Tuckman & Jensen, 1977) and the need for elements such as goal-clarity, communication, commitment, respect, competence, and evaluation (Ku et al., 2013; Page & Donelan,

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2003; Weinstein et al., 2013). However, due to lack of group experience as well as challenges related to working with others, it is not abnormal for students to express resistance to project teams (Calongne, 2002; Oakley et al., 2007; Reinke, 2001; Weinstein et al., 2013). Educators can also experience resistance at times, due to challenges such as those related to team evaluation measures (Reinke, 2001). Therefore, more research is needed to investigate precursors that help foster project work satisfaction for both educators and students involved in team processes. The study at hand expounds upon previous team dynamics research by nuancing precursors and reviewing certain variables that may predict project team satisfaction. Findings can give help equip educators with the information needed to work with students in creating collaborative learning environments.

Effective team project work can benefit learners in high school (Bush et al., 2017), college (Casper, 2017), graduate and professional studies (Weinstein et al., 2013), and organizational adult education training programs (Dirks, 2019). When learners are satisfied with project teams, they are more likely to perform at higher rates (Lamm et al., 2014; Weinstein et al., 2013). In addition to increased achievement (Miller & Polito, 1999), benefits of effective team experiences also include improved interpersonal skills, enhanced ability to trust others and be open, better social support and satisfaction, increased self-awareness, and greater ability to work with others from different disciplines (Weinstein et al., 2013). Cooperative and group learning can also lead to positive peer and educator interactions and can foster favorable attitudes about one's higher education experience (Oakley et al., 2007). Agricultural educators recognize that students learning in groups can learn and achieve more in teams than on their own (Bush et al., 2017), an observation students themselves have also recognized (Weinstein et al., 2013). Organizations acknowledge that decision-making is more strategic, holistic, and effective when done in teams (Casper, 2017). Thus, in the classroom and in the workplace, complex problems can be solved more effectively in groups (Dormody & Sutphin, 1991) and team products are of higher quality (Calongne, 2002).

Though the benefits of group project work are documented, "research has shown that merely putting students in groups and telling them to work together does not, in and of itself, promote higher achievement" (Page & Donelan, 2003, p. 125). Intentionally teaching learners about the process of teamwork is encouraged (Casper, 2017; Page & Donelan, 2003; Reinke, 2001; Weinstein et al., 2013) and underscores the role educators play in the satisfaction one experiences within a team setting. When educators better understand students' experiences with team project work, they are more equipped to provide guidance for the process; guidance that has been shown to promote team satisfaction and the perception of instructor effectiveness (Oakley et al., 2007). In fact, student satisfaction with their team experience, along with educator guidance, influence if students believe classroom learning objectives are met (Oakley et al., 2007). When agricultural educators are actively involved in group problem-solving, shared responsibility, and expressing respect for what students bring to the table, it can increase a student's motivation to participate in group initiatives (Dormody & Sutphin, 1991). Results of the study at hand can assist educators in preventing team dissatisfaction (Oakley et al., 2007) as they balance the guidance and ownership given to students. Ku et al. (2013) revealed that team dynamics, team acquaintance (e.g., relationship building), and instructor support accounted for 53% of team satisfaction for a sample of online learners. The current study reviews similar information, but involves students receiving face-to-face curriculum while focusing on distinct components of team dynamics. The study also builds upon research relating to team satisfaction derived from intrinsic and extrinsic motivation (Buckmaster & Carroll, 2009; Lamm et al., 2014).

Investigating the relationship between satisfaction and students' experiences of team and group work is essential to the 2016-2020 American Association for Agricultural Education (AAAE) National Research Agenda (Roberts et al., 2016). More specifically, priority area four of the research agenda challenges educators to create "meaningful [and] engaged learning in all environments" (Edgar et al., 2016, p. 37). Incorporating teamwork into educational curriculum aligns with the sentiment of research agenda authors (Edgar et al., 2016), who posit that, "today's learners need high-level cognitive abilities and a more personal instructional design" (p. 38). Additionally, now, more than ever, food and

agricultural organizations are among the many employers looking for future workers to have effective teamwork skills (Crawford et al., 2011; Stripling & Ricketts, 2016). Research and societal trends indicate the necessity and permanency of teamwork skills in the workplace (Casper, 2017; Reinke, 2001). Thus, educators who help students learn how to navigate team dynamics now are also aiding in students' future workforce success (Lamm et al., 2014), giving them a competitive edge in the job market (Casper, 2017). In fact, organizations may expect educators to prepare students for collaborative work settings (Zeitun et al., 2013). Educational project teams have the potential to give students other transferable skills related to teamwork such as conflict resolution and critical thinking (Dormody & Sutphin, 1991; Edgar et al., 2016; Bush et al., 2017). Teamwork is pervasive and thus, team dynamics are experienced across all areas of agricultural education. Therefore, the study at hand can assist with cross-dimension implications and can benefit multiple aspects of the field. Likewise, study findings can assist with monitoring and evaluating the effectiveness of agricultural education (Edgar et al., 2016). This research assists with the responsibility that, "Creating and evaluating meaningful learning environments is essential to educating future generations" (Edgar et al., 2016, p. 39).

Theoretical Framework

Studies have shown that satisfaction is the degree of contentment toward a student's circumstances, as determined by the interplay between diverse variables related to a one's experience (Aldridge & Rowley, 1998; Butt and Rehman, 2010; Elliot & Dooyoung, 2002; Mai, 2005). Project team satisfaction can be viewed through the lens of certain variables, specifically process clarity, procedural justice, frustration, and perceived group fit. Exploring these variables yields to the opportunity to view them collectively rather than dichotomously and in a way that investigates potential synthesis among them. Choosing and defining the variables is a generative addition to team satisfaction literature. Additionally, applying team variables that are studied in organizational literature to educational research can provide insight on how to better prepare students for team dynamics experienced outside the classroom.

Clarity

Role clarity is the information individuals need to adequately perform a role, including: 1) the expectations of the role, 2) the activities that fulfill responsibilities, and 3) the consequences of role-performance to self, others, and the organization (Kahn et al., 1964). Lyons (1971) split role clarity into two types, objective and subjective, defining objective role clarity as the presence of adequate role information. Subjective clarity is defined as the feeling of how much information the individual perceived they need against how much they are given (Lyons, 1971). When role clarity is not present, role ambiguity results. Rizzo, Housem, and Lirtzman (1970) associated role ambiguity with the predictability of outcome for one's behavior and the clarity of existing requirements which help guide behavior. As is the case in organizations, complexity, change, and lack of communication (Lyons, 1971) can all contribute to role ambiguity in student project teams. Kahn et al. (1964) found that both subjective and objective role clarity are related to satisfaction and reduced tension. Subjective role clarity associated with ambiguous role expectations were related to greater tension and decreased job satisfaction than clear expectations (Kahn et al., 1964). Further supporting the link between clarity and satisfaction, Sawyer (1992) found that process clarity had a direct relationship to job satisfaction, as well as an indirect relationship to job satisfaction mediated by goal clarity. Whitaker, Dahling, and Levy (2007) tested the effects of feedback-seeking on role clarity, finding that an environment which encouraged feedback-seeking from supervisors and coworkers led to increased role clarity. The authors hypothesized enhanced role clarity may increase organizational effectiveness through the improvement of task performance and the increase of employee ability to engage in contextual performance (Whitaker et al., 2007). Hu and Liden (2011) found a positive relationship between process clarity with team performance and team citizenship behavior. The effect of process clarity on team potency was maximized when accompanied by servant leadership behavior, which bolstered team confidence and effectiveness (Hu & Liden, 2011). Teams whose members understood their individual goals and

procedures as well as the connections between individual goals and team goals had the greatest chance of building team potency and enhancing team performance and citizenship behavior (Hu & Liden, 2011). Thus, role clarity provides a clear standard of performance to team members, which fosters improvement (Whitaker et al., 2007).

Justice

Within the literature, there are two main types of justice: distributive justice and procedural justice. Distributive justice is the perceived fairness of resource allocation or outcomes, while procedural justice is the perceived fairness of the process used to determine this allocation of resources or outcomes (Moorman, 1991). Deutsch (1975) posited three distributive justice methods for outcome allocation among individuals. A needs-based approach operates under the assumption that outcome allocation should be dependent on individual needs, with higher outcomes being distributed to individuals who display more need (Deutsch, 1975). An equality-based approach believes outcomes should be equally allocated regardless of member contribution, while an equity-based approach means individuals receive allocations proportional to their inputs or contributions (Deutsch, 1975). Colquitt and Jackson (2006) found that an equality-based approach was more important for allocation of resources in team contexts, when the task was interdependent and the goal is to promote social cohesion and harmony. Conversely, an equity-based approach was more important for resource allocation in individual contexts, when it is possible to measure individual contributions and individual productivity is crucial (Colquitt & Jackson, 2006). Concerning justice in educational settings, Horan, Chory, and Goodboy (2010) found that students are highly concerned with classroom fairness and that their perceptions of fairness are related to their perceptions of instructor communication. These judgements of fairness were primarily based on the classroom-related procedures and policies used to determine grading, make-up/late assignments, and feedback (Horan et al., 2010). When students felt that these procedures were enforced unfairly, they typically exhibited emotional responses such as anger, frustration, powerlessness, and disgust (Horan et al., 2010). Student behavioral responses to perceived classroom injustices included dissent, hostility, withdrawal, inaction, adaption, and acceptance (Horan et al., 2010). Chory-Assad (2002) found that classroom procedural justice was positively related to student affective learning, which is the educational equivalent of job satisfaction. Therefore, teachers may be able to enhance student affective learning by mitigating perceptions of procedural injustice through fair grading processes, high-quality feedback, and fair make-up/late work policies (Horan et al., 2010). Furthermore, Chory-Assad and Paulsel (2004) found that student perceptions of procedural justice were associated with resistance to instructor requests, either through revenge or deception. Student perceptions of procedural justice were also found to be related to student engagement with a teacher, including behaviors such as indirect personal aggression and hostility (Chory-Assad, 2002; Chory-Assad & Paulsel, 2004). Chory (2007) found that student perceptions of instructor credibility, which is composed of competence, character, and caring (McCroskey & Teven, 1999), predicted student perceptions of procedural justice. When students perceived that their instructors had trustworthy characters and cared about their students, students were more willing to report favorable perceptions of procedural justice (Chory, 2007).

Frustration

Spector (1978) defined frustration as the interference between goal attainment or the interference with goal maintenance. This emotion produces a negative emotional state and increases physiological arousal within an individual (Spector, 1978). Physiological arousal is influenced by strength of frustration, which depends on 1) the importance of the goal to the individual, 2) the degree of interference, and 3) the number of interferences within a span of time (Spector, 1978). Behaviors resulting from frustration may be classified into four categories: 1) trying a different response or alternative means to achieve a goal, 2) aggression, 3) withdrawal from the situation, and 4) abandoning a goal and choosing to either leave or remain in the situation (Spector, 1978). A study examining the challenges of a web-based distance education course found that students reported the most frustration

with course content and instructor communication (Hara, 2000). Additionally, lack of prompt feedback and lack of immediate instructor assistance when experiencing difficulties with understanding course content or completing assignments exacerbated feelings of frustration among students (Hara, 2000). Moreover, students reported feelings of distress and frustration when they did not receive specifications regarding coursework, had difficulty locating resources to aid in completing coursework, and perceived unclear instructor expectations regarding coursework (Hara, 2000). Keenan & Newton (1984) examined the relationship between environmental frustration and psychological strain, finding that the presence of emotional arousal enhances the association between frustration and hostility, as well as frustration and dissatisfaction. Additionally, organizational climate was found to be an important contributor to frustration (Keenan & Netwon, 1984). Thus, a warm and supportive environment was likely to lead to a reduction of overall frustration, while a cold and hostile environment was likely to lead to an increase in frustration (Keenan & Newton, 1984). Storms and Spector (1987) found that locus of control had a moderating effect on behavioral reactions associated with frustration. Individuals with an external locus of control placed blame for their frustration on external conditions and were less likely to work toward a resolution than those with an internal locus of control. While the tendencies to engage in these behavioral actions did not differ between individuals with internal and external loci of control, the situations in which these behaviors were expressed did differ; those with an external locus of control experienced heightened incidences of aggression, sabotage, and withdrawal when frustrated (Storms & Spector, 1987).

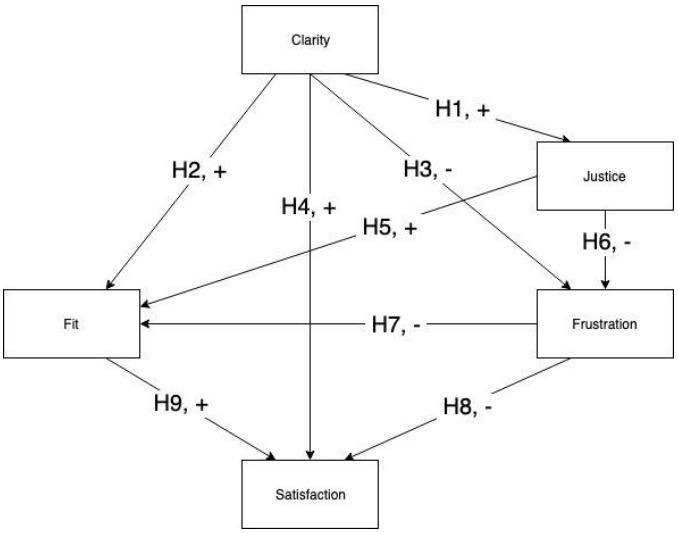
Fit

Kristof-Brown, Zimmerman, and Johnson (2005) defined perceived fit to be an individual's direct assessment of the compatibility between themselves and their environment. Therefore, perceived fit may serve as a proxy between interpersonal compatibility of an individual and their work group (Kristof-Brown et al., 2005; Judge & Ferris, 1992; Kristof, 1996; Werbel & Gilliland, 1999). Perceived fit has been examined in the literature based on relationships with commonly studied outcome criteria. For example, Kristof-Brown et al. (2005) found perceived person-group fit had a moderate true score correlation with job satisfaction, organizational commitment, and intention to quit. Additionally, perceived person-group fit had a strong positive correlation with group cohesion (Kristof-Brown, et al., 2005). O'Reilly, Chatman, and Caldwell (1991) found that person-organization fit was positively related to normative commitment and job satisfaction, as well as negatively correlated with intent to leave and turnover rate. Further analysis showed that fit was a significant predictor of normative commitment, job satisfaction, and intent to leave (O'Reilly et al., 1991). A meta-analysis of perceived fit studies conducted by Verquer, Beehr, and Wagner (2003) found that perceived person-organization fit had a positive correlation with both job satisfaction and organizational commitment. Additionally, perceived person-organization fit was negatively correlated to turnover intention (Verquer et al., 2003). Furthermore, Hoffman and Woehr (2006) found that person-organization fit only exhibited weak to moderate relationships with task performance and turnover. An alternate theory suggested perceived person-organization fit may be a distal predictor of task performance when mediated by indirect work attitude effects (Chi & Pan, 2012; Shrout & Bolger, 2002).

Purpose and Hypotheses

The purpose of this study was to hypothesize a structural model for the direct and indirect relationships between clarity, justice, perceived fit, frustration, and satisfaction, and to confirm the validity of our model (Figure 1).

Figure 1
Project Team Satisfaction Model with Hypothesized Relationships



Hypothesis 1: Clarity and Justice. When there is greater clarity concerning role responsibilities and consequences for not meeting expectations, individuals have a greater understanding of their organization's judicial procedures (Lee, 2001). Therefore, we expect increased clarity to improve perceptions of justice and posit that: Process clarity will have a positive relationship with procedural justice.

Hypothesis 2: Clarity and Perceived Fit. When individuals have a better understanding of their duties, this may enhance relationship quality among group members (Bang et al., 2010). Additionally, this clarity bridges the gap between the individual's and the team's goals, which fosters a greater sense of unity amongst team members (Hu & Liden, 2011). As a result: Process clarity will have a positive relationship with perceived fit.

Hypothesis 3: Clarity and Frustration. In the absence of clarity, role ambiguity results and affects the way an individual internalizes and perceives the task at hand (Sawyer, 1992). This ambiguity is associated with increased tension among workers, which may result in frustration (Lyons, 1971). Thus: Process clarity will have a negative relationship with frustration.

Hypothesis 4: Clarity and Satisfaction. Much research concerning clarity has been devoted to determining its relations with satisfaction (Kahn et al., 1964). Arvey, Dewhirst, and Boling (1976) found a linear positive relationship between goal clarity planning and satisfaction; these results were furthered bolstered by Sawyer (1992), who observed direct relationships between process clarity and satisfaction. Therefore: Process clarity will have a positive relationship with satisfaction.

Hypothesis 5: Justice and Perceived Fit. Subordinate perceptions of fairness within an organization may affect how these individuals perceive their sense of belonging. This claim is bolstered by Lipponen, Olkkonen, and Moilanen's (2004) finding that procedural justice is significantly related to common in-group identity. So as members perceive greater fairness, they are more likely to feel connected to the group (Lipponen et al., 2004), which leads us to propose that: Procedural justice will have a positive relationship with perceived fit.

Hypothesis 6: Justice and Frustration. People have an inherent drive to maintain a balance between contributions to job and subsequent rewards (Adams, 1963). When this balance is disrupted by perceptions of unfairness, the responses to this lack of equity mirror responses to frustration, with members engaging in less cooperative communication and other retaliatory behaviors (Adams, 1963; Lee, 2001). Therefore: Procedural justice will have a negative relationship with frustration.

Hypothesis 7: Frustration and Perceived Fit. Worker frustration may produce negative behavioral reactions among organization members, such as sabotage, personal aggression, and withdrawal (Storms & Spector, 1987). When tension exists among group members, it is likely that the frustrated individual does not feel connected to other members of the group. Therefore: Frustration will have a negative relationship with perceived fit.

Hypothesis 8: Frustration and Satisfaction. Eaton (1952) hypothesized that worker frustration may be caused by perceived insignificance of one's work. Due to burnout being related to dissatisfaction (McHugh et al., 2011) and frustration (Lewandowski, 2003), it is plausible that: Frustration will have a negative relationship with satisfaction.

Hypothesis 9: Perceived Fit and Satisfaction. Much research has been conducted to support the link between an individual's perception of fit within an organization or group and their subsequent satisfaction levels (Kristof-Brown et al., 2005; O'Reilly et al., 1991; Verqueer et al., 2003). When an individual feels as though they belong within an organization, they are more likely to be satisfied with their job. As a result, we posit that: Perceived fit will have a positive relationship with satisfaction.

Methods

To investigate the research purpose and hypotheses, a descriptive and correlational research study was employed. The population for this study consisted of undergraduate agricultural leadership students. A convenience sample of four classes of undergraduate students from a single course taught over multiple semesters at a southern land-grant university. The data analyzed within this study capitalizes on data previously collected within the Lamm et al. (2014) sample. The current study is fundamentally different from previous analysis in three primary ways. First, the previous study centered on motivation analysis, this study examines a unique set of antecedent variables: clarity, justice, frustration, and fit. Second, the current analysis focuses on not only the interactions of independent variables predicting team satisfaction, but also on the interactions between independent variables themselves. Lastly, the previous research only analyzed two classes of data. The current research analyzes two additional classes thus increasing the statistical power upon which to infer conclusions. These disclosures are made based on existing recommendations for clarity (Kirkman & Chen, 2011). Data were collected using a paper-based questionnaire that was distributed, completed, and recollected for analysis during a single class period. A total of 155 respondents were included in the analysis with a response rate of 100%. All classes had a similar structure and included the assignment of project teams at the beginning of the course that worked on a team determined project throughout the semester. At the conclusion of the course individuals were asked to reflect on their in-class project team experience and respond to the questionnaire accordingly.

The current study was part of a larger study examining the undergraduate project team experience from a comprehensive perspective. Therefore, the current study focuses on a subset of scales that were collected and analyzed as part of the data collection effort. Specific to the variables of interest examined in the present study previously established scales were used to capture data. Clarity was operationalized using the process clarity was measure proposed by Sawyer (1992). Respondents were asked to indicate their certainty as it related to five statements on a five-point Likert-type scale (5 – "Very certain," 4 – "Certain," 3 – "Neutral," 2 – "Uncertain," 1 – "Very Uncertain"). A sample statement includes: *Considering all your project tasks, how certain are you that you know the best ways to do these tasks*. The overall Cronbach's α value for the scale was 0.85. Justice was operationalized using the procedural justice construct proposed by Parker, Baltes, and Christiansen (1997).

Respondents were asked to indicate their agreement with four statements on a five-point Likert-type scale (5 – "Strongly agree" to 1 – "Strongly disagree"). A sample statement includes: *Members of my project team are involved in making decisions that directly affect their work*. The overall Cronbach's α value for the scale was 0.63; previous research had established internal structure validity and internal consistency sufficiency with a reported Cronbach's α of .74 (Parker et al., 1997). Frustration was operationalized using the frustration with work scale proposed by Peters, O'Connor, and Rudolf (1980). The scale was adapted to a project team context. Respondents were asked to indicate their agreement with three statements on a five-point Likert-type scale (5 – "Strongly agree" to 1 – "Strongly disagree"). A sample statement includes: *Trying to get this project done was a very frustrating experience*. The overall Cronbach's α value for the scale was 0.74. Fit was operationalized using the perceived person-organization fit scale proposed by Cable and Judge (1996). Respondents were asked to indicate their agreement with three statements on a five-point Likert-type scale (1 – "Not at all," 2 – "Slightly," 3 – "Neutral," 4 – "Mostly," 5 – "Completely"). A sample statement includes: *My values match those of my current project team members*. The overall Cronbach's α value for the scale was 0.86. Participants self-reported their level of project team satisfaction using a researcher adapted work satisfaction measure proposed by Judge, Boudreau, and Bretz (1994). The measure includes three items. The first item asked respondents to indicate if they were satisfied with their project team by responding "yes" (coded as a 1) or "no" (coded as a 0). The second item asked respondents to indicate how they felt about their project team in general using a seven-place circular face satisfaction series. The seven items were coded from 1 – "Least satisfied" to 7 – "Most satisfied." Finally, participants reported the percentage of time that they were satisfied with their project team on average; available responses ranged from 0% to 100%. A satisfaction index score was calculated by multiplying each of the three items.

Structural equation modeling (SEM) was used to analyze the research hypotheses. Data were initially analyzed and cleaned using SPSS version 25 and then input and further analyzed using AMOS version 25. The Chi-square test of model fit was not significant. ($\chi^2 = 2.95$, $df = 1$, $p = .086$). Non-significant chi-square observations indicate strong model fit (Bollen, 1989). Additional model fit statistics were calculated in accordance with the recommendations in the literature (Hu & Bentler, 1998; Schreiber et al., 2006), specifically, comparative fit index (CFI), Tucker Lewis Index (TLI), and root mean square error of approximation (RMSEA) were computed. Model fit statistics were within acceptable ranges indicated good fit for CFI (.99). According to Hu and Bentler (1998) CFI values of 0.90 represent marginal fit, with values below 0.90 indicating poor fit and values 0.95 representing good fit. However, RMSEA (.09) and TLI (.84), were not within the established range for acceptable model fit. According to Hu and Bentler (1998) RMSEA values less than 0.08 represent acceptable model fit and TLI value ranges are consistent with CFI ranges. Despite the inconsistency in fit analysis, the model was deemed acceptable based on guidance proposed by Schreiber et al. (2006) "if the vast majority of the indexes indicate a good fit, then there is probably a good fit" (p. 327).

Results

Within a common five-point range for clarity, justice, frustration, and fit, individuals reported the highest score associated with clarity ($M = 4.17$; $SD = .61$). Individuals reported the lowest score associated with frustration ($M = 2.29$; $SD = .83$) as reported in Table 1.

Table 1
Index Summary

	M	*SD*
Clarity[a]	4.17	.61
Justice[b]	4.04	.50
Frustration[b]	2.29	.83
Fit[c]	3.80	.79
Satisfaction[d]	5.34	1.98

Note. Scale: [a]1 – "Very uncertain," 2 – "Uncertain," 3 – "Neutral," 4 – "Certain," 5 – "Very certain"; [b]5-point Likert-type scale with 1 – "Strongly disagree," 5 – "Strongly agree"; [c]1 – "Not at all," 2 – "Slightly," 3 – "Neutral," 4 – "Mostly," 5 – "Completely"; [d]range from 0 to 7.

The direct effects indicated that clarity and fit were both positively related to project team satisfaction, frustration was negatively related to project team satisfaction (Table 2). Of the three, frustration had the largest direct effect (standardized coefficient = -.37). Within the model frustration was predicted to be a more proximal predictor of project team satisfaction with frustration serving as a moderating variable to more distal predictors, specifically clarity and justice. Both clarity and justice were observed to have significant negative direct effects on frustration with justice having the larger observed effect (standardized coefficient = -.21). The effects of clarity, justice, and frustration on fit were also calculated. Of the three, clarity had the largest observed effect (standardized coefficient = .40). Procedural justice was not found to have a statistically significant direct effect on fit. Squared multiple correlations of predictor variables are displayed in Table 3. A total of 52.7% of the variance in project team satisfaction was predicted by the model, including both direct and indirect effects.

Table 2

Unstandardized, Standardized, and Significance Levels for Direct Effects

Parameter Estimate	Unstandardized	Standardized	*p*
Procedural Justice			
← Process Clarity	.29	.36	.00**
Frustration			
← Process Clarity	-.23	-.17	.05*
← Procedural Justice	-.35	-.21	.01*
Fit			
← Process Clarity	.50	.40	.00**
← Frustration	-.30	-.31	.00**
← Procedural Justice	.10	.07	.39
Satisfaction			
← Fit	.74	.29	.00**
← Frustration	-.88	-.37	.00**
← Process Clarity	.91	.29	.00**

Table 3

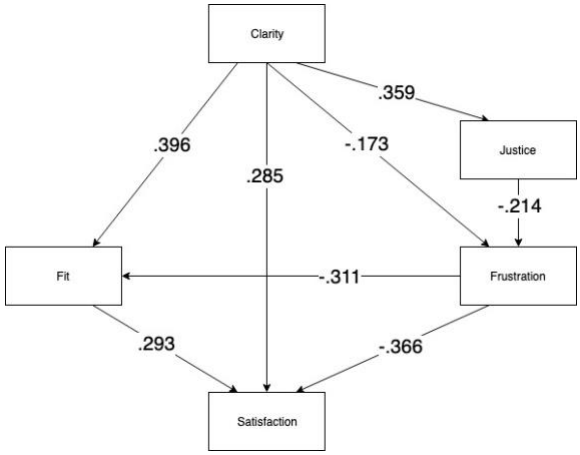
Squared Multiple Correlations of Predictor Variables

	R_2
Procedural Justice	.129
Frustration	.102
Fit	.348
Satisfaction	.527

A graphical representation of the model resulting from the SEM analysis is shown in Figure 2. Non-significant direct effects were removed from the original version shown in Figure 1 to aid in clarity and interpretation. Of particular note is the absence of direct effects associated with procedural justice and fit. Error terms, although not indicated in the figure, were present in the analysis.

Figure 2

Results for the Project Team Satisfaction Model with Statistically Significant Standardized Direct Effects Noted



Note. CFI = .99; TLI = .84; RMSEA = .09; X_2 = 2.95; degrees of freedom = 1.

The standardized indirect effects observed in the model are presented in Table 4. Of the four antecedent predictors of satisfaction, clarity (standardized coefficient = .237) and Justice (standardized coefficient = .117) had the largest significant indirect effect on the project team satisfaction variable. The standardized total effects observed in the model are presented in Table 5. Of the four antecedent predictors of satisfaction, clarity (standardized total effect = .521) and frustration (standardized total effect = -.457) had the largest significant indirect effect on the project team satisfaction variable.

Table 4

Standardized Indirect Effects of Clarity, Justice, Frustration, Fit, and Satisfaction

	Clarity	Justice	Frustration
Justice	-	-	-
Frustration	-.077	-	-
Fit	.101	.067	-
Satisfaction	.237	.117	-.091

Table 5

Standardized Total Effects of Clarity, Justice, Frustration, Fit, and Satisfaction

	Clarity	Justice	Frustration	Fit
Justice	.359	-	-	-
Frustration	-.250	-.214	-	-
Fit	.496	.131	-.311	-
Satisfaction	.521	.117	-.457	.293

Conclusions, Implications, and Recommendations

The role of clarity, justice, frustration, and group fit variables were studied alongside agricultural leadership students' satisfaction with project team work. Eight of nine hypotheses were confirmed. The roles of process clarity and frustration provided particularly significant findings; results indicate that for every one standard deviation increase in process clarity, satisfaction goes up by .521 standard deviations. Additionally, as frustration goes up by one standard deviation, satisfaction goes down by .457 standard deviations. These findings can be applied to how student-teacher interaction influences student satisfaction (Strickland & Elson, 1987). Thus, educator influence must be taken into consideration when preparing students for project work success.

In an educational setting, educators are storehouses of information. Sharing this knowledge prompts a cognitive response within students, enabling them to process the information and relocate the information from their short-term memory to their long-term memory storage (Titsworth et al., 2015). When educators communicate with a heightened degree of clarity, students are better able to process, store, and retrieve information, which is the goal of the learning process (Titsworth et al., 2015). Chesebro (2003) found that higher levels of teacher clarity were directly associated with enhanced student learning. These findings are supported by additional studies by Titsworth (2001a; 2001b) and Chesebro and McCroskey (2001). Based on the results of the study at hand, higher levels of clarity are also associated with team member satisfaction. Findings complement Calongne's (2002) propositions about how an educator's clear instructions (and the reiteration of those instructions) reduce student anxiety. Prompt feedback, defined tasks, articulation of team goals, established member roles, and intentional educator guidance (Hara, 2000; Page & Donelan, 2003) help with clarity and lead to less student frustration. Educators are encouraged to notice behaviors indicating student frustration (Spector, 1978) and to provide assistance as students process their locus of control in team environments.

Despite the results associated with the present study, there are limitations that must also be considered. First, the data has limited power due to the number of respondents. Thus, while collected over multiple years, the results may not be representative of the broader population and therefore generalizability of results is cautioned. It is recommended that researchers replicate this type of study with different populations and in different environments. A second limitation of the study is the lower than desired Cronbach's α associated with the justice measure; it would have been preferable to obtain a value greater than .70 to provide additional confidence to subsequent results (e.g. Cortina, 1993). Nevertheless, the model fit was deemed acceptable based on available measures and standards (Bollen, 1989; Hu & Bentler, 1998). An associated recommendation would be to replicate the study and increase the statistical power associated with the analysis. An additional limitation is the manner in which the data were collected, specifically within a single classroom environment over multiple years. Although replication of the data within the context increases statistical power it is possible that the results are also influenced by other extraneous variables. For example, all classes had the same instructor and similar course content. The delivery and content may also have an impact on the observed results. An associated recommendation for future research would be to replicate the study in other classroom environments where the course content is not focused on leadership development in teams. For example, an animal science or horticulture course using teams may provide a more content neutral environment in which to examine team satisfaction and results.

The variables presented in this study are not an all-inclusive variable list. However, a recommendation would be for agricultural educators to recall the results of this preliminary data when working with undergraduate project teams. Specifically, limiting frustration and maximizing clarity has the greatest potential for impact on satisfaction. Thus, agricultural educators are encouraged to first focus on clearly articulating the expectations associated with project teams. In practice, educators could enact habits such as asking students to repeat instructions and expectations back to them to confirm that project team instructions have been understood. An additional recommendation is to monitor project teams for emerging frustration and to intervene as appropriate.

"Team interaction should not be avoided despite the difficulties we face when managing teams. Instead, we need to identify strategies for taking advantage of teamwork and team synergy..." (Calongne, 2002, p. 219). Research shows that this type of effort is worth it due to the amount of potential learning and satisfaction that can take place in face-to-face, online, high-school, post-secondary, and organizational settings because of team, versus individualistic, initiatives. As agricultural educators use evidenced-based strategies, such as those presented in this study, implications

of best practices can positively affect educators' influence, instructional design and evaluation, and workforce preparedness.

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