Using an Acculturation Lens to Assess Diversity-Related Workplace Behaviors

by

Rohini Abhyankar

A Dissertation Presented in Partial Fulfillment
of the Requirements for the Degree
Doctor of Philosophy

Approved April 2022 by the
Graduate Supervisory Committee:

Samantha R. Brunhaver, Chair
Jennifer Bekki
Shawn Jordan

ARIZONA STATE UNIVERSITY

May 2022

ABSTRACT

Significant efforts are underway by engineering organizations to diversify their workforce. However, research findings on workplace diversity are mixed, with insufficient clarity into what makes heterogeneous work environments successful. Acknowledging the role of individual behavior in building diverse workplaces that are cohesive and productive, researchers have called for more theory-based investigation into individuals' workplace behaviors and their determinants. This three-part study bridges the gap within an engineering context by leveraging Berry's acculturation framework (Berry, 1972, 2005) from cross-cultural psychology to examine the factors influencing engineers' acculturation behaviors in workplaces. Acculturation refers to the process by which individuals adjust to people different from themselves in their daily interactions (Berry, 1972, 2005). Based on Berry's framework, the study postulates four acculturation attitudes and behaviors for engineers—Integration, Assimilation, Separation, and Marginalization. Acculturation attitudes are based on acculturation preferences, such as the importance an individual places on retaining individual values and the importance an individual places on receiving acceptance from coworkers. These acculturation attitudes and perceived acceptance together influence behaviors.

The first study designed and validated an instrument to measure engineers' acculturation preferences, acculturation behaviors, and perceived acceptance from coworkers. The results provided complete to partial support for the expected correlations among factors. The second study conducted cluster and Chi-square analyses focusing on the two acculturation preferences. The results revealed four clusters corresponding to Berry's acculturation attitudes and revealed findings, such as women's preference for

Integration attitude over men's. The third study used a path model to gain insight into gender differences in engineers' acculturation behaviors and revealed acceptance as a crucial factor. The results quantitatively substantiated prior findings, namely, that women engineers prefer Assimilation and Separation behaviors more and Integration behavior less mediated by factors related to acceptance.

The developed instrument and study findings offer researchers another lens to study organizations' diversification efforts, along with other personal and contextual factors. The study findings could also help engineering organizations recruit employees with acculturation attitudes favorable to the organization's diversity goals and design trainings that highlight the importance of coworker acceptance. Such interventions would facilitate the creation of more diverse work environments.

DEDICATION

Dedicated to the memory of my parents Bapu, Dr. Vasant Kelkar, and Aai, Mrs. Sulekha Kelkar, for instilling the value of independent thought in me and equipping me with tools that empowered me to pursue my dreams and facilitated my journey through life.

ACKNOWLEDGMENTS

I would like to express my sincere and deep gratitude to my committee advisor, Dr. Samantha Brunhaver, for accepting me as her first Ph.D. student and being my guide on this adventure-filled journey. I thank her for entertaining my ideas and occasional wild explorations while keeping me within the guardrails of rigor of academic research with patience and fortitude. I appreciate her critical reviews and pointed questions, which helped me bring my research topic into focus. It was because of her patient support that I was able to develop a solid survey instrument, based on an acculturation framework, to examine the workplace behaviors of engineers. I was able to complete this dissertation work thanks to Dr. Brunhaver's countless hours of reading, reviewing, and discussing my writing while helping me sharpen my academic writing skills.

I thank Drs. Bekki and Jordan for agreeing to be on my committee and their critical questions and feedback, which elevated my research to a higher level. I am grateful to Dr. Bekki for encouraging me to apply to the EESD Ph.D. program without which none of this would have materialized. I also thank her for laying the foundation of my survey writing skills in the quantitative methods class and her valuable feedback during the survey writing process of this research. I am grateful to Dr. Jordan for his guidance during the qualitative methods class and on the RED project but most of all for his willingness to accommodate my last minute request to be on the committee.

I am thankful to Dr. Brunhaver and Dr. McKenna for the opportunity to work on their NSF funded projects—Professional Engineering Pathway Studies and Revolutionizing Engineering Departments. These projects taught me valuable qualitative research skills and supported me financially during the course of the program.

I extend my gratitude to the ASU Alumni Association for granting me access to their alumni database that enabled me to gather data for my research. I also thank members of my graduate cohort Eunsil, Mark, and Wen, for their support and comradery during my adjustment phase as I was returning to school after a gap of several years.

I could not have successfully completed my journey had it not been for the rock solid support of my family, who patiently tolerated my constant preoccupation with work, and listened to my evolving research idea. I am grateful to my husband, daughter, son, and my sister for their encouragement and positive attitude. My family was my support particularly when I worked through my exasperation and frustration when the progress seemed slow and completion a daunting task. They were my sounding board, my informal reviewers, and my cheerleaders during my bouts of frustration and disappointment.

Last but not the least; I thank my late parents for instilling the value of independent thought in me and giving me the tools to pursue my dreams. I dedicate this work to them.

TABLE OF CONTENTS

Page

CHAPTER Page

CHAPTER Page

APPENDIX Page

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

DISSERTATION OVERVIEW

The subject of workplace diversity continues to receive significant attention due to its reported benefits to organizations (e.g., Guillaume et al., 2013, 2017; Mohammadi, Broström, & Franzoni, 2017; Page, 2007). Although many view diversification within organizations as advantageous, insufficient clarity exists about what makes a heterogeneous work environment successful (Cletus et al., 2018; Roberson, Ryan, & Ragins, 2017; Romanenko, 2012). Diversity research broadly examines two types of diversity – surface-level diversity, focused on observable differences, e.g., race, gender, ethnicity, and age (Jackson, May, & Whitney, 1995; Riordan, 2000), and deep-level diversity, focused on unobservable differences such as in personality, attitudes, cognitive styles, organizational tenure, organizational function, education, background, and values (Harrison, Price, & Bell, 1998; Harrison et al., 2002; Homan et al., 2008). Both streams have received significant attention, and the research findings are complex and often contradictory. The challenge for organizations related to diversity is one of aligning individuals to the organization's values and culture while retaining the unique and creative perspectives that each person brings (McMillan & Lopez, 2001).

Diversity's beneficial or non-beneficial outcomes manifest, at least in part, through employee workplace behaviors (Ely & Thomas, 2001; Sluss, Ashforth, & Gibson, 2012). Whereas some behaviors align well with organizations' diversification efforts, others do not. To gain further clarity into the behaviors that contribute to diverse and inclusive work environments and the factors that influence them, several researchers

have called for systematic and theory-based investigation into the interplay between employee preferences, perceptions, and behaviors (Tamunomiebi & John-Eke, 2020; Cletus et al., 2018; Roberson, Ryan, & Ragins, 2017; Romanenko, 2012). This dissertation addresses these calls by investigating the factors that relate to workplace acculturation behaviors. On an individual level, acculturation is defined as a process in which psychological changes (attitudes and behaviors) occur in response to interacting with people different from oneself (Berry, 1972, 2005). These differences could be based on gender, ethnicity, physical and mental ability, age, and the resulting attitudes, beliefs, and values that comprise their worldview (McMillan-Capehart, 2004). Workplace acculturation behaviors, therefore, are those employees adopt in response to interacting with coworkers who may differ from them on some dimension. These behaviors and their determinants can be understood through the lens of Berry's (1997, 2005) acculturation framework.

Originally developed to study migrants, Berry's framework features two orthogonal, bipolar dimensions of cultural maintenance (the importance the individual places on retaining their heritage culture) and cultural adaptation (the importance the individual places on making contact with and participating in the new culture). Presuming acceptance from the new host culture, Berry posits that these acculturation preferences together form four acculturation attitudes: (1) Integration (high adaptation, high maintenance), (2) Assimilation (high adaptation, low maintenance), (3) Separation (low adaptation, high maintenance), and (4) Marginalization (low adaptation, low maintenance). Extant studies have leveraged Berry's framework to understand or theorize about the acculturative experiences of different employee populations in the workplace.

For example, Hood and Koberg (1994) have theorized about applying the framework to women in male-dominated industries, drawing parallels between the women and immigrants joining a new society; however, this model has not been instrumented or empirically tested.

The current three-part study leverages Berry's acculturation framework to propose and validate a comprehensive workplace acculturation model which relates employee acculturation behaviors to three main determinants: Importance of Retaining Own Values (IRV), Importance of Coworker Acceptance (ICA), and Perceived Acceptance from Coworkers (PA). There is evidence to suggest that these factors each play a role in the behaviors exhibited by the employee (Bauer et al., 2007; Sluss & Ashforth, 2007; Stryker & Burke, 2000; Tajfel & Turner, 1986; Weiss & Cropanzano, 1996). For example, employees who perceive acceptance from their coworkers are more likely to socially integrate into their work group (Allen & Meyer, 1990; Chrobot-Mason & Aramovich, 2013; Slepian, 2020) and to engage more voluntarily in positive citizenship behaviors (Coleman & Borman, 2000; Mowday, Steers, & Porter, 1979). Conversely, employees who experience a lack of freedom to be themselves at work (Cox, 1994; Chrobot-Mason & Aramovich, 2013; Slepian, 2020) may cope by giving up their unique traits or isolating themselves socially.

A quantitative research design was chosen for the current research to allow for model development and subsequent analysis of the interplay between workplace acculturation behaviors, preferences, and perceptions. Data for the three studies were collected, in phases, by inviting participation from over 18,000 working engineers who

had earned bachelor's, master's, or doctoral degrees in engineering from a large public university in the southwestern United States within the last fifteen years.

The first study designed and validated a survey instrument to empirically measure each of the determinants in Berry's model as adapted to engineering workplaces. The measured determinants—IRV, ICA, and PA—were examined for correlations with each workplace acculturation behavior—Integration, Assimilation, Separation, and Marginalization. The survey validation was done in two steps using two separate samples for exploratory (n = 216) and confirmatory (n = 573) factor analysis, respectively. In addition, survey items were written without reference to specific cultural markers.

The second study used cluster analysis (n = 502) to assign participants to attitudinal clusters based on their acculturation preferences, IRV and ICA. The study further explored the associations between demographic traits and attitudinal cluster memberships through the use of Chi-square analyses.

The third study developed and analyzed a path model (n = 502) relating the three acculturation determinants to the four workplace acculturation behaviors. In addition, gender was included in the model to determine the differential impacts of acculturation determinants on acculturation behaviors for women engineers, as compared to men.

The following chapters present the three studies, detailing the backgrounds, methods, findings, and implications, followed by a conclusion.

POSITIONALITY STATEMENT

Topic – I am an engineer, a physics teacher, and a first-generation immigrant. During my several years of industry experience, I have experienced and witnessed positive and negative interpersonal dynamics. I have formed terrific friendships with coworkers while simultaneously witnessing other women and men who do not identify with the prevalent male-dominated engineering culture get marginalized at work. On the other hand, I have also observed women engineers inadvertently propagating masculine traits and my friends acquiring American accents and names in an effort to belong.

Because of these experiences, the subject of workplace acculturation is almost personal to me. I have a strong interest in understanding how people approach their interactions with their coworkers – particularly if those coworkers are in some way different from them – and the impact this has on making workplaces diverse and inclusive. Embarking on my doctoral dissertation in Engineering Education, I gravitated toward the topic of studying women's experiences in engineering. However, I soon widened my focus to include both observable and non-observable markers of diversity out of the recognition that some of my non-American men coworkers experienced the engineering culture the same way I did, even though they were men. This choice was also supported by a small but growing and powerful literature base on the experiences of other marginalized groups in engineering (i.e., based on race/ethnicity, age, ability, etc.) with whom I have less familiarity as research populations but desire to study more in the future.

Framework – When I stumbled upon Berry's acculturation framework, it instantly resonated with me as both a woman and an immigrant. I could instantly relate to how

individuals could slide among different behaviors over time and situations to fit in. The framework seemed like a behavior map for me and most of my women engineer and men immigrant engineer friends. I also connected with the idea of acculturation preferences – the choice to retain one's individuality and/or stay in contact with the larger group. Being a believer in live-and-let-live ideology, I found the language to describe myself when I read about the integration attitude that ranks high on both preferences. Importantly, Berry's acculturation framework implies that individuals have been afforded the acceptance to make these decisions freely. Based on my experiences, I considered it crucial to make the need for acceptance explicit.

Methodology – As a physics teacher, engineer, and cryptic writer, before coming to social science research, I opted to conduct a quantitative study instead of a qualitative study at the first chance I got. Since then, I have developed a deep appreciation for qualitative research. I believe qualitative research unearths valuable information which can then be leveraged and amplified by the quantitative world. I, therefore, look forward to conducting a qualitative study as the next phase of this research.

CHAPTER 2

ASSESSING KEY FACTORS IN WORKPLACE ACCULTURATION DYNAMICS DEVELOPMENT AND VALIDATION OF MEASURES

1. Introduction

The subject of workplace diversity continues to receive significant attention due to the reported benefits to organizations (e.g., Guillaume et al., 2013, 2017; Mohammadi, Broström, & Franzoni, 2017; Page, 2007). Yet, although many view diversification within organizations as advantageous, insufficient clarity exists about what makes heterogeneous work teams successful (Cletus et al., 2018; Roberson, Ryan, & Ragins, 2017; Romanenko, 2012). Research in this area broadly examines two types of diversity – surface-level diversity, focused on observable differences, e.g., race, gender, ethnicity, and age (Jackson, May, & Whitney, 1995; Riordan, 2000), and deep-level diversity, focused on unobservable differences such as in personality, attitudes, cognitive styles, organizational tenure, organizational function, education, background, and values (Harrison, Price, & Bell, 1998; Harrison et al., 2002; Homan et al., 2008). Jansen and Searle (2021) emphasize that research findings related to surface and deep-level diversity are complex and often contradictory. For example, while one study has found that surface-level diversity may benefit groups even in the absence of deep-level diversity (Phillips & Loyd, 2006), other studies have concluded that it is deep-level diversity that increases innovation, creativity, and performance (Rink & Ellmers, 2010; Torchia, Calabrò, & Morner, 2015; Wang et al., 2019). Still, more research suggests that

differences in deep-level characteristics can create bias and prejudice that limit work productivity, employee satisfaction, and cohesion among coworkers (Cletus et al., 2018; van Oudenhoven-van der Zee et al., 2009). Thus, questions of how to approach diversity pose a dilemma for organizations (Bassett-Jones, 2005).

This myriad of research perspectives makes clear that, to best advance workplace diversity efforts, additional research is necessary to understand the complexities surrounding surface- and deep-level diversity (Hoever et al., 2012; Jansen & Searle, 2021; Van Knippenburg, De Dreu, & Homan, 2004). However, simply recruiting employees with different characteristics – whether surface-level or deep-level – will be insufficient to reap the benefits of having a diverse workplace if employees' behaviors do not support an underlying culture of pluralism and integration (Ely & Thomas, 2001; Harrison et al., 1998). For example, while concerted efforts on the part of employees to understand each other and integrate different perspectives into their thinking can be beneficial, the complete assimilation of employees into the work culture propagates the status quo without question or examination (Humphrey et al., 2007; Turner & Onorato, 1999). In addition, when employees prefer to interact only with individuals like themselves, groupism and an us-versus-them mentality may ensue (Ely & Meyerson, 2006; Ely & Roberts, 2008). Finally, when employees isolate themselves from their coworkers, they are likely to become disengaged and dissatisfied and have a higher risk of job departure (Slepian, 2020). Each of these behaviors can keep an organization from reaching its goals of workplace diversity, which we define as inclusive of both surface- and deep-level differences (McMillan-Capehart, 2005). Instead, the advantages of workplace diversity appear to be best cultivated in instances where employees positively

and proactively engage with coworkers both similar to and different from themselves (Pickett & Leonardelli, 2006; Roberts & Creary, 2013). Therefore, understanding the determinants of employee behavior that make such engagement possible is critical to promoting diversification of the work environment.

Research indicates that multiple motives influence individuals' decisions about whether and how much they engage socially at work (Sluss & Ashforth, 2007; Stryker & Burke, 2000; Tajfel & Turner, 1986). Among these motives are the desire for social acceptance (Baumeister & Leary, 1995; Deci & Ryan, 2000; Maslow, 1968) and the desire for individual distinctiveness (Baumeister, 1999; Vignoles, Chryssochoou, & Breakwell, 2000; Snyder & Fromkin, 1980). Although people are described as possessing both desires, the relative value a person assigns each may vary based on social and cultural factors. For example, people from individualistic cultures tend to be more socialized to prioritize autonomy and personal expression, whereas people from collectivistic cultures tend to be more socialized to prioritize group loyalty and cohesion (e.g., Fiske et al., 1998; Hofstede, 1983; Triandis, 1995). Increased desire for acceptance or distinctiveness may also arise depending on an individual's current situation – those who feel too much like a group outsider may assimilate and engage in norm-congruent behaviors to satisfy their need to belong, while those who feel too like others in a group may distance themselves and emphasize their individuality to satisfy their need to differentiate (Brewer, 1991; Moreland, 1985). Generally, individuals are more likely to behave according to the desires most salient to them (Stryker & Burke, 2000). For example, scholars have identified the desire to connect with others and feel accepted by a larger group as a significant motivational driver of employee engagement and citizenship

behaviors, which in turn increases perceived acceptance and relational identity (Ashforth, Harrison, & Corley, 2008; Rochford, 2013). However, behaviors intended to satisfy individuals' desires in the short term may undermine social interactions in diverse organizations in the long term (Crocker & Park, 2004; Roberts & Creary, 2013). Over-identification with a group may result in loss of individual voices (Humphrey et al., 2007; Turner & Onorato, 1999), while other behaviors like self-isolation or self-segregation may undermine mutual learning and relationships (Ely & Meyerson, 2006; Ely & Roberts, 2008). Therefore, creating a culturally diverse work environment where all employees come with their unique perspectives and integrate with one another requires bringing these desires and related behaviors into balance (Pickett & Leonardelli, 2006; Roberts & Creary, 2013).

Perceived social acceptance, the feeling of being respected and well-liked by one's work colleagues, is another important influence on interpersonal work behavior (Bauer et al., 2007). Coworkers' treatment of an employee can be accepting or non-accepting (Weiss & Cropanzano, 1996), with acceptance occurring more frequently for those who are similar to their coworkers than for those who are different (Byrne, 1971; Mannix & Neale, 2005). Employees who perceive acceptance from their coworkers are more likely to socially integrate into their work group (Allen & Meyer, 1990; Chrobot-Mason & Aramovich, 2013; Slepian, 2020) and to engage more voluntarily in positive citizenship behaviors (Coleman & Borman, 2000; Mowday, Steers, & Porter, 1979). Conversely, employees who do not perceive acceptance from their coworkers may feel like they cannot be themselves at work (Cox, 1994; Chrobot-Mason & Aramovich, 2013; Slepian, 2020). Instead, they might opt to change things about themselves to better fit

into their work group, completely isolate themselves from coworker interaction, or seek out bonds with others like themselves to belong. They may also be more likely to leave their organization (Slepian, 2020; Van der Zee & Sandal, 2016). Such behaviors have been noted by scholars studying the experiences of women and underrepresented racial/ethnic groups working in engineering, for example (Hatmaker, 2013; Faulkner, 2009a; Douglas, Richardson, & Dupuy, 2017). It is, therefore, crucial for organizations focused on diversification to create workplaces where all individuals, with their distinguishing traits, feel comfortable and secure in being themselves and can function to their full potential (Delizonna, 2017; Pravamayee, 2014). According to Patrick and Kumar (2012), diversity thrives where there is acknowledgment and respect for each individual's uniqueness, which is further supported by research demonstrating that organizations gain from diversity when employees feel welcome and accepted by others in their organization (Joslin, Waters, & Dudgeon, 2010; Phillips & Thomas-Hunt, 2007; Slepian, 2020; Valenzuela, Flinchbaugh, & Rogers, 2020). Some scholars refer to this phenomenon as psychological safety, i.e., the feeling of being able to work without fear of ridicule or retribution from one's coworkers and managers (Edmonson, 1999).

In sum, organizations must be cognizant of the dynamics that underlie the interactions among their employees to harness the benefits associated with diversity in the workplace. Several researchers have called for systematic and theory-based investigation into the interplay between employee preferences, perceptions, and behaviors to understand the hurdles faced in building inclusive and diverse work environments (Tamunomiebi & John-Eke, 2020; Cletus et al., 2018; Roberson, Ryan, & Ragins, 2017; Romanenko, 2012). Berry's (1997) acculturation model from cross-cultural psychology offers a

suitable foundation for this work. Acculturation refers to a process by which individuals adjust to people different from themselves in their daily interactions (Berry, 1972, 2005). These differences could be based on gender, ethnicity, physical and mental ability, age, and the resulting attitudes, beliefs, and values that comprise their worldview (McMillan-Capehart, 2004). Originally developed to capture the acculturation process experienced by immigrants, Berry's framework suggests that workplace acculturation behaviors that can help or hinder the diversification of the workplace are influenced by three key attributes of the employee – their Importance of Retaining Own Values (IRV), Importance of Coworker Acceptance (ICA), and Perceived Acceptance from Coworkers (PA). In this paper, we leverage Berry's framework to develop and validate an instrument that captures each of these constructs. Results for this study come from factor and correlation analyses with 789 working engineers one to fifteen years past earning an engineering degree from a large, public university within the southwestern United States. Findings gleaned using this instrument could inform future research and action that accentuate the positive impacts of diversity within workplaces, for example, the design of interventions to encourage specific attitudes or the hiring of individuals that promote an inclusive work environment.

2. Theoretical background and research hypotheses

Acculturation refers to the psychological changes (i.e., attitudes and behaviors) that occur in individuals during their interactions with those who differ in some way from themselves (Berry, 1972, 1997, 2005). Berry's (1997) acculturation model has its origins in studies of migrants moving from their original heritage culture to a new host culture.

Berry posits that the combination of two orthogonal preferences – the importance of retaining one's individual beliefs, traits, and values and the importance of staying connected to the larger group – comprise individuals' acculturation attitudes, also known as acculturation orientations (Ben-Shalom & Horenczyk, 2003). Individuals who rank high (H/H) or low (L/L) on both preferences are said to have an Integration or Marginalization attitude, respectively; individuals who rank high on value-retention and low on connection (H/L) are said to have a Separation attitude; finally, individuals who rank low on value-retention and low on connection (L/H) are said to have an Assimilation attitude. These attitudes are then assumed to influence the acculturation strategies (i.e., behaviors) that individuals adopt in their daily interactions with others.

Berry's (1997) model has been leveraged in organizational research in various ways. Some researchers have applied the model to the study of immigrants' intercultural workplace relationships with coworkers, finding that immigrants with higher levels of adjustment to the host culture tend to report higher-quality coworker relationships (Jian, 2012) and that conflicts in preferred acculturation orientations between host and immigrant employees produce the lowest-quality coworker relationships (Komisarof, 2009; Oerlemans & Peeters, 2010). Other researchers have associated the acculturation orientations of immigrants with specific work outcomes. In these studies, adopting an Integration or Assimilation attitude has been positively associated with job satisfaction, work-related well-being, and organizational fit, while adopting a Separation or Marginalization attitude has been negatively associated with the same (Lu, Samaratunge, & Härtel, 2012, 2016; Peeters & Oerlemans, 2009; Valenzuela et al., 2020). Berry's model has been extended to examine non-immigrant populations as well, including

women in male-dominated workplaces (Hood & Koberg, 1994) and relocated employees following the internal merger of two work groups (Joslin et al., 2010). These and other papers argue that, although employee status in a diverse organization is not identical to immigrant status in a new host culture, there are similarities. Employees who encounter coworkers that differ from themselves will experience some degree of acculturation in the workplace (McMillan-Capehart, 2005), and while these employees may be required to interact with their coworkers as part of their job, their acculturation preferences will influence how and to what extent such interaction occurs (e.g., Jian, 2012; Komisarof, 2009; Oerlemans & Peeters, 2010).

Existing research uses Berry's (1997) model to understand the acculturative experiences of different employee populations, e.g., as denoted by their nationality, gender, or functional unit. Comparatively, little to no work has adopted Berry's model to explore the interactions among employees who differ from each other generally, with notable exception (McMillan & Lopez, 2001), and even this variation on the framework has not been instrumented or empirically tested. The current study addresses this gap by adopting Berry's (1997) acculturation model to design a survey instrument that links employees' Importance of Retaining Own Values (IRV), Importance of Coworker Acceptance (ICA), and Perceived Acceptance from Coworkers (PA) to their workplace acculturation behaviors without tying these constructs to specific cultural markers. We present our constructs and hypotheses in the following sections.

2.1 Workplace interactional behavior

In this study, we operationalize Berry's (1997) four acculturation strategies – Integration, Assimilation, Separation, and Marginalization – as employees' acculturation behaviors in the workplace. Further, for the purpose of this study, we define Integration behavior as when an employee has good working relationships and interacts easily with their coworkers, irrespective of differences in values, backgrounds, or beliefs. We define Assimilation behavior as when an employee downplays their uniqueness and makes a concerted effort to fit in with coworkers. We define Separation behavior as when an employee interacts primarily with coworkers they perceive as like them. Lastly, we define Marginalization behavior as when an employee minimizes their interactions with coworkers, making little to no effort to socialize. Research suggests that individuals' perceptions influence their behaviors (Ajzen, 2012; Berry, 1997). This study conceptualizes employee workplace acculturation behaviors as resulting from the interplay between their workplace acculturation preferences and perceived acceptance from coworkers.

2.2 Workplace acculturation preferences

Individuals' acculturation preferences form over time in response to social and cultural factors and, in turn, influence how individuals interact with people who differ themselves in subsequent situations (Berry, 1997). This study defines Importance of Retaining Own Values (IRV), based on Berry's criteria, as the importance an employee assigns to upholding and acting according to their own principles, beliefs, and values and

Importance of Coworker Acceptance (ICA) as the importance they assign to being welcomed and included by their coworkers. Notably, Berry's acculturation model presumes that acceptance is automatically granted to the acculturating individual in their new environment and specific combinations of acculturation preferences (i.e., attitudes) map directly to certain acculturation strategies (Berry, 1972, 1997, 2005; Sam & Berry, 2010). However, research shows that, as individuals acculturate, there often is no one-to-one correspondence between acculturation attitudes and behaviors, the discrepancy between which can be attributed to perceived lack of acceptance (Navas et al., 2005; Sam & Berry, 2010).

2.3 Perceived acceptance from coworkers

Berry's work conceptualizes perceived acceptance as the freedom to act according to one's acculturation preferences unhindered by expectations from the larger group (Sam & Berry, 2010). Perceived acceptance has been shown to play an influential role in the relationship between individuals' "ideal" acculturation attitudes and "real" acculturation behaviors (Navas et al., 2005, p. 1; see also Joslin et al., 2010, and Valenzuela et al., 2020). For example, perceiving a denial of acceptance, an individual preferring to integrate into their workplace might instead seek out belonging from a smaller group of individuals similar to themselves. In this study, we term Perceived Acceptance from Coworkers (PA) as an employee's perception of being welcomed and included by their coworkers.

2.4 Hypotheses generation

Informed by the above research, we propose that IRV, ICA, and PA work in concert to influence workplace acculturation behavior. Specifically, we hypothesize that employees who exhibit Integration behavior, i.e., socialize easily with all coworkers, prioritize both retaining their values and belonging to the larger workplace culture and perceive positive acceptance from coworkers.

Hypothesis 1. Integration behavior will be positively correlated with IRV, ICA, and PA

Similarly, we hypothesize that employees who exhibit Assimilation behavior, i.e., downplay their uniqueness to fit in with coworkers, prioritize belonging to the larger workplace culture over retaining their values. They may also perceive a lower level of positive acceptance from coworkers than employees exhibiting an Integration behavior.

Hypothesis 2. Assimilation behavior will be negatively correlated with IRV and positively correlated with ICA and PA.

We further hypothesize that employees who exhibit Separation behavior, i.e., associate primarily with individuals like themselves, prioritize retaining their values but not necessarily belonging to the larger workplace culture. They will also perceive negative acceptance from coworkers.

Hypothesis 3. Separation behavior will be positively correlated with IRV and negatively correlated with ICA and PA.

Lastly, we hypothesize that employees who exhibit Marginalization behavior, i.e., minimize contact with all coworkers, prioritize neither retaining their values nor

belonging to the larger workplace culture and perceive negative acceptance from coworkers.

Hypothesis 4. Marginalization behavior will be negatively correlated with IRV, ICA, and PA.

3. Instrument overview

Three scales comprise the Workplace Acculturation Instrument: Workplace Acculturation Behaviors, Workplace Acculturation Preferences, and Perceived Acceptance from Coworkers. The Workplace Acculturation Behaviors scale asks respondents to indicate their level of agreement with each of sixteen items related to their behavior at work on a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). Items for the scale were generated for this study leveraging Berry's (1997) acculturation framework. The scale features statements designed to capture respondents' self-reported ways of working and socializing with coworkers among four dimensions. Items include, "I get along with my colleagues irrespective of differences in our personal beliefs" (Integration), "I prioritize fitting into the larger group" (Assimilation), "I socialize only with people who share my values" (Separation), and "I do not interact with coworkers unless I have to" (Marginalization).

The Acculturation Preferences scale asks respondents to rate items related to the Importance of Retaining Own Values (IRV) and the Importance of Coworker Acceptance (ICA) on a five-point ordinal scale from 1 (not at all important) to 5 (extremely important). Items corresponding to IRV were formulated based on the "authentic living" factor within Van den Bosch and Taris' (2014) Authenticity at Work measure and

included statements such as, “You follow your own principles.” Items corresponding to ICA were created based on Leary et al.’s (2013) Need to Belong measure and included statements such as, “You are accepted by your colleagues.”

The Perceived Acceptance from Coworkers (PA) scale asks respondents to indicate the extent they agree with each of six items related to their experiences at work on a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). Three items were adapted from Malone, Pillow, and Osman’s (2012) General Belongingness Scale; for example, from “I have close bonds with family and friends” to “I have strong bonds with my coworkers.” The remaining three items were newly generated for this study and included statements such as, “My coworkers are welcoming of me.”

We present the development and validation of this instrument over two studies. The first study involves initial scale development and exploratory factor analysis to examine the initial factor structure of each measure. The second study involves confirmatory factor analysis and correlation analysis to further investigate evidence of instrument validity. Each study used data from separate samples of working engineers one to fifteen years past earning an engineering degree from a large, public university within the southwestern United States.

4. Scale development and exploratory factor analysis

4.1 Item generation and content validation

The author team developed the Workplace Acculturation Instrument in the spring of 2019. Berry’s (1997) acculturation model and literature on workplace authenticity and belonging (e.g., Leary et al., 2013; Malone et al., 2012; Van den Bosch & Taris, 2014)

guided the item writing process. Each scale underwent multiple iterations based on feedback from five engineering practitioners (three men and two women), each with over ten years of work experience, as well as from two faculty members (both women) and two doctoral students (both women) with expertise in workplace culture, diversity studies, and psychological measurement. Comments from both groups were used to successively improve the clarity and readability of the survey, making each item easier for participants to understand and answer. The initial instrument had 42 items (Workplace Acculturation Behaviors: 24; Workplace Acculturation Preferences: 12; Perceived Acceptance from Coworkers: 6), plus a short demographic survey, and took approximately 10 minutes to complete.

4.2 Exploratory factor analysis

4.2.1 Participants

Invited participants to the survey were approximately 4,000 engineering alumni who had earned a bachelor's, master's, or doctoral degree in engineering within the last fifteen years from a large, public university in the southwestern United States. This sample was derived from an overall population of about 20,000 engineering alumni from that institution during that period. To ensure a balanced participant sample, we first assigned participants to stratification cells by gender, degree type, degree field, and graduation year and then randomly selected participants from each cell in proportion to their representation in the overall population. Each participant received an initial invitation email to the survey and two reminder emails over two weeks. The survey was

administered online, and completers of the survey had the opportunity to enter a random drawing for one of twenty $25 Amazon gift cards as an incentive.

Of 266 respondents, 216 had complete or partially complete responses to the survey and reported holding an engineering job. Seventy-one percent of respondents described themselves as men, 28% described themselves as women, and 1% preferred not to answer. They worked as individual contributors (62%), project leads (18%), managers (8%), and "other" roles (12%). In addition, the majority of respondents had worked in engineering for less than seven years (73%) and in their current job for less than four (67%).

4.2.2 Methods

Exploratory factor analysis (EFA) is an item-reduction technique wherein a factor structure that explains the most variance in the response pattern across items in the fewest number of common factors is identified and each factor represents a single unique dimension within the latent construct being measured. EFA was conducted on each scale in SPSS 25 (IBM Corp., 2019) following guidelines given by McCoach, Gable, and Madura (2013). Each analysis was performed using pairwise deletion, meaning that we included respondents in the analysis of scales for which they had complete data and excluded them from the analysis of scales for which they had incomplete data. The recommended ratio of subjects to items is typically five to ten (e.g., Cattell, 1978; Everitt, 1975; Nunnally, 1978). Because our largest scale, Workplace Acculturation Behaviors, consisted of 24 items and had complete responses from 191 respondents, our smallest subject-to-item ratio was 8.0 and, hence, appropriate for conducting EFA.

The suitability of each scale for EFA was determined using the Kaiser-Meyer-Olkin measure of sampling adequacy (> .6 for all scales) and Bartlett's test of sphericity ($p < .05$ for all scales) (McCoach et al., 2013). The number of factors to extract per scale was established using the output of parallel analysis and theory, with triangulation from the scree test and Kaiser's criterion method (McCoach et al., 2013). EFA was then performed using parallel axis factoring based on the observation that most scales in the dataset were multivariate non-normal (Fabrigar et al., 1999). A promax rotation was also used for the multidimensions scales, Workplace Acculturation Behaviors and Acculturation Preferences, based on the assumption that dimensions could be correlated (Fabrigar et al., 1999; Hurley et al., 1997). Items that loaded low (< .4) on all factors or cross-loaded (> .3) across multiple factors were removed at each iterative step of factor analysis (McCoach et al., 2013). Each factor was then evaluated based on its number of items since factors with at least three items are considered most reliable (McCoach et al., 2013).

4.2.3 Results

Parallel analysis, the scree test, and Kaiser's criterion method all indicated that two factors be extracted for the Workplace Acculturation Preferences scale. EFA produced a five-item Importance of Retaining Own Values (IRV) factor and a five-item Importance of Coworker Acceptance (ICA) factor. The two-factor solution accounted for 52% of the total variance measured.

Similarly, all three methods of factor extraction suggested Perceived Acceptance from Coworkers (PA) to be unidimensional. All six original scale items loaded onto one factor and explained 61% of the total variance measured.

Regarding the Workplace Acculturation Behaviors scale, parallel analysis suggested the extraction of three factors. However, because items for this scale were written to correspond to Berry's (1997) four acculturation strategies, we had reason to expect a four-dimensional factor structure. Forcing a four-factor solution for Workplace Acculturation Behaviors yielded a four-item factor for Assimilation behavior, a five-item factor for Separation behavior, a four-item factor for Marginalization behavior, and a two-item factor for Integration behavior. Altogether, the four-factor solution accounted for 52% of the total variance measured. Because Integration contained just two items in the final solution, we reexamined these items, identified a theme of "valuing oneself while respecting others," and expanded the existing item pool with two similarly worded items. We also included another set of five items representing a different manifestation of Integration behavior, i.e., "getting along with coworkers similar and different to oneself." By adding these items to the survey, we hoped to retain at least three items on the Integration behavior factor in subsequent confirmatory factor analysis (CFA) as desired.

5. Confirmatory factor analysis and correlation analysis

5.1. Confirmatory factor analysis

5.1.1. Participants

Invited participants to the revised survey were a new sample of 12,000 engineering alumni who had earned a bachelor's, master's, or doctoral degree in

engineering within the last fifteen years from the same large, public southwestern U.S. university as in Study 1. The same sample selection procedures were used in Study 2 as in Study 1 such that this sample was also representative by gender, degree type, degree field, and graduation year of the overall population of 20,000 engineering alumni from that institution during that period. An initial invitation email and two reminder emails were sent to participants over two weeks, and completers of the online survey had the opportunity to enter a random drawing for one of forty $50 Amazon gift cards as an incentive.

A total of 747 alumni responded to the survey. Among the 605 who had complete or partially complete responses and reported working as an engineer, 69% identified themselves as men, 29% identified themselves as women, and 2% preferred not to answer. They responded that they were working as individual contributors (55%), project leads (18%), managers (11%), and in 'other' roles (16%). Lastly, most respondents had less than seven years working in engineering (61%) and less than four years working in their current job (63%).

5.1.2 Methods

Confirmatory factor analysis (CFA) is a structural equation technique that evaluates how well a given dataset fits to an a priori-defined model. CFA was conducted in Mplus 6 (Muthén & Muthén, 1998) using the robust maximum likelihood estimation technique to cross-validate the factor structure obtained for each scale in Study 1. Traditional cutoffs were used to evaluate the fit of the CFA model for each scale (CFI ≥ .90, RMSEA ≤ .10, SRMR ≤ .08; Hu & Bentler, 1999). A non-significant $\chi 2$ statistic ($p >$

.05) is also traditionally considered indicative of good fit; however, this metric is not a good measure for evaluating model fit with large samples exceeding 200 (Brown et al., 2015) and will therefore be shared for reporting purposes only. The removal of items from each CFA was guided by item factor loadings (< .6) and significance levels ($p > .05$). Our smallest case-to-parameter ratio was 6.5 for Workplace Acculturation Behaviors, meeting the recommended case per parameter threshold for CFA of 5:1 (Tanaka, 1987). Once CFA was performed, internal consistency reliability was evaluated for each factor per scale. Internal consistency reliability measures whether a set of items will consistently load onto the same factor (McCoach et al., 2013) and is generally evaluated using Cronbach's alpha. The minimum acceptable level for alpha in research is .7 (Cronbach, 1951).

5.1.3 Results

The final scales, with items, standardized factor loadings, p-values, means, standard deviations, and Cronbach's alpha for each scale, are given in Appendix A. Results of the CFA on the Workplace Acculturation Preferences scale indicated good fit to the underlying data across all measurement indices (RMSEA = .07, CFI = .96, SRMR = .06; $\chi 2(34) = 120.4$, $p < .001$). Standardized factor loadings ranged from .65 to .84 for the Importance of Retaining Own Values (IRV) subscale and from .72 to .83 for the Importance of Coworker Acceptance (ICA) subscale, with all factor loadings reaching statistical significance ($p < .001$). Cronbach's alpha for IRV and ICA were good at .88 and .89, respectively.

Similar analysis of the Perceived Acceptance from Coworkers (PA) scale showed excellent fit to the data on all measurement indices (RMSEA = .02, CFI = 1.00, SRMR =

.01; $\chi 2(5) = 6.2$, $p = .29$) after removing one item ("I have strong bonds with my coworkers"). Standardized factor loadings for the final items ranged from .72 to .88, and all factor loadings were statistically significant ($p < .001$). Cronbach's alpha for PA was also excellent at .90.

Lastly, the CFA on the Workplace Acculturation Behaviors scale revealed excellent fit to the data on all measurement indices (RMSEA = .04, CFI = .96, SRMR = .05; $\chi 2(146) = 296.5$, $p < .001$) after removing one item from the Assimilation factor ("I prioritize attending work-related social events even if the events do not interest me"), one item from the Marginalization factor ("I skip work-related social events"), and all five items with the underlying theme of "valuing oneself while valuing others" from the Integration factor. Standardized factor loadings were between .61 and .67 for Integration behavior, between .60 and .79 for Assimilation behavior, between .68 and .74 for Separation behavior, and .71 and .75 for Marginalization behavior. All factor loadings were statistically significant ($p < 0.001$). Cronbach's alpha was good for Integration and Assimilation behavior (.76 for both) and excellent for Separation and Marginalization behavior (.83 for both).

5.2 Correlation analysis

5.2.1 Methods

Examining intercorrelations between theoretically related concepts is one approach to further assess evidence of instrument validity (Heale & Twycross, 2015). Bivariate correlations were therefore calculated between each of the Workplace Acculturation Instrument subscales to evaluate each of our theory-based hypotheses. We

specifically examine the correlations between each Workplace Acculturation Behavior (i.e., Integration, Assimilation, Separation, and Marginalization) and our three antecedent factors, Importance of Retaining Own Values (IRV), Importance of Coworker Acceptance (ICA), and Perceived Acceptance from Coworkers (PA).

5.2.2 Results

The correlations among each Workplace Acculturation Behavior, IRV, ICA, and PA are shown in Table 1.1. We observed that the correlations between Integration behavior and IRV ($r = .34$, $p < .001$), ICA ($r = .27$, $p < .001$), and PA ($r = .53$, $p < .001$) were low to moderate in strength, positive in direction, and statistically significant. Hypothesis 1 was therefore supported.

Assimilation behavior exhibited low correlations with IRV, ICA, and PA. Furthermore, the correlation between Assimilation behavior and IRV ($r = -.08$, $p = .052$) was negative as expected and reaches borderline statistical significance, while the correlations between Assimilation behavior and ICA ($r = .29$, $p < .001$) and Assimilation behavior and PA ($r = .09$, $p = .040$) were positive as expected and fully statistically significant. Hypothesis 2 was thus also supported.

Correlations between Separation behavior and IRV, ICA, and PA were low to moderate in strength. The correlation between Separation behavior and PA ($r = -.10$, $p = .016$) was negative as expected and statistically significant. However, the correlation between Separation behavior and IRV ($r = -.04$, $p = .414$) was negative contrary to expectation and not statistically significant, and the correlation between Separation

behavior and ICA (r = .12, p = .005) was statistically significant but positive against expectation. Hypothesis 3 was thus only partially supported.

Lastly, the correlations between Marginalization behavior and ICA (r = -.11, p = .012) and Marginalization behavior and PA (r = -.24, p < .001) were low, negative as hypothesized, and statistically significant, while the correlation between Marginalization behavior and IRV (r = .01, p = .823) was low, positive contrary to expectation, and not statistically significant. Hypothesis 4 was partially supported. In summary, analysis of the correlations between subscales provided partial additional evidence for the instrument's validity.

Table 1.1: Descriptive statistics and intercorrelations for Workplace Acculturation Instrument subscales

#	Factor	M	SD	1	2	3	4	5	6	7
1	Importance of Retaining Own Values (IRV)	4.18	.70	-	.38**	.30**	.34**	-.08*	-.04	.01
2	Importance of Coworker Acceptance (ICA)	3.91	.79		-	.41**	.27**	.29**	.12**	-.11*
3	Perceived Acceptance from Coworkers (PA)	4.07	.65			-	.53**	.09*	-.10*	-.24**
4	Integration behavior	4.09	.52				-	.04	-.25**	-.24**
5	Assimilation behavior	2.67	.76					-	.51**	.31**
6	Separation behavior	2.29	.78						-	.58**
7	Marginalization behavior	2.46	.87							-

** Correlation is significant at .01 level (2-tailed), * correlation is significant at .05 level (2-tailed), N = 573

6. Discussion and implications

The present study leverages Berry's (1997) acculturation model from cross-cultural psychology to develop an instrument with which to measure and understand the underlying determinants of employee behaviors that contribute to a culturally diverse workplace. Two samples of working engineers were used to investigate the validity of the instrument. Exploratory factor analysis (EFA) revealed a four-dimensional factor structure for Workplace Acculturation Behaviors, a two-dimensional factor structure for Workplace Acculturation Preferences, and a unidimensional factor for Perceived Acceptance from Coworkers. Confirmatory factor analysis with a separate sample corroborated each factor structure, and internal consistency estimates were strong for each sub-scale. Intercorrelations between factors also provided additional, theory-based evidence of instrument validity for most subscales. Moreover, engineers in this sample generally scored high on Integration behavior, Importance of Retaining their Values (IRV), and Importance of Coworker Acceptance (ICA), which aligns well with previous study findings that most acculturating individuals prefer to adopt an Integration-based attitude/behavior as they acculturate (Berry, 2003, 2005). Results from the studies, therefore, suggest initial support for the instrument's psychometric properties. We now turn our attention to further consideration of the intercorrelation findings.

The positive, significant correlations between Integration behavior and Importance of Retaining Own Values (IRV), Importance of Coworker Acceptance (ICA), and Perceived Acceptance from Coworkers (PA) are among our strongest findings supporting the instrument's validity. The correlations between Assimilation behavior and IRV, ICA, and PA were also significant and in the expected directions. Berry's (1972,

1997, 2005) model postulates that acculturating individuals who rate themselves high on both value-retention and connection to the larger group are most likely to engage in Integration behavior, while individuals who rate themselves low on value-retention and high on connection to the larger group are most likely to engage in Assimilation behavior. The ability to freely act on one's acculturation preferences and assimilate or integrate into the larger group at will also connotes a certain degree of perceived acceptance by its members (Navas et al., 2005; Sam & Berry, 2010). The findings related to Integration behavior and Assimilation behavior thus align with theory and confirm Hypotheses 1 and 2.

On the other hand, intercorrelations between subscales only partially confirm Hypotheses 3 and 4. Both Separation behavior and Marginalization behavior were found to be negatively associated with PA, as expected, based on the literature (e.g., Joslin et al., 2010; Slepian, 2020; Valenzuela et al., 2020). Marginalization behavior was also negatively associated with ICA, affirming research that employees with a strong desire to belong are more likely to engage with others versus withdraw at work (Ashforth et al., 2008; Rochford, 2013). However, the study failed to support Berry's (1972, 1997, 2005) proposition that Separation behavior is most likely to occur among those who rate themselves high on value-retention and low on connection to the larger group. The correlation between Separation behavior and IRV was negative and statistically non-significant, while the correlation between Separation behavior and ICA was statistically significant but positive. Similarly, Marginalization behavior was expected to correlate with low value-retention (Berry, 1972, 1997, 2005), but the correlation between Marginalization behavior and IRV was positive and non-significant.

The data suggest that contrary to what Berry's (1997) theory suggests, employees' desire to separate themselves from the larger group and instead socialize with a smaller group of coworkers do so more to feel a sense of belonging amid a perceived lack of broader acceptance from their coworkers rather than to fulfill a desire for retaining their uniqueness. This finding is supported by research showing that individuals who seek subgroup membership, separate from the larger group, are often fulfilling a desire to belong (Brewer, 1991; Moreland, 1985). A similar explanation can be applied to the non-significant correlation between Marginalization behavior and IRV. While it is likely that some employees electively marginalize themselves to preserve their uniqueness, it appears that far more employees become marginalized due to ostracization in the workplace. However, a crucial difference between Separation and Marginalization is that Marginalization behavior and ICA are negatively related, which may account for why those who engage in Marginalization behavior tend to isolate rather than seek out community with those like themselves (if such a community even exists) when experiencing mainstream rejection. This finding is important given that, again, the need to belong is linked to employee engagement and citizenship behaviors, which in turn increase perceived workplace belonging and create a positive feedback cycle (Ashforth et al., 2008; Rochford, 2013). Individuals low on this need are less likely to engage in these behaviors and, thus, may be less likely to see their benefits. Further research can help better understand the conditions that lead to Separation and Marginalization behaviors and the impact on employee and organizational outcomes.

The overarching aim of this study was to develop and validate a new instrument with which to advance organizational diversification efforts. We see several ways in

which this instrument can advantage organizations. First, the instrument can be used to gain a baseline understanding of employees' acculturation attitudes, perceptions of acceptance, and preferred acculturation behaviors. Such data can help determine the extent to which employees are contributing to desired workplace behaviors (e.g., willingly engaging with coworkers while, at the same time, preserving their unique characteristics and perspectives) and identify the factors contributing to or detracting from them. Second, organizations can use findings from the instrument to recruit, educate, and train employees to have attitudes and behaviors that align with their performance goals. For example, organizations looking to enhance creativity and innovation may want to encourage the adoption of Integration behavior, whereas organizations interested in promoting conformity and efficiency may want to promote Assimilation behavior among their employees. Third, given that perceived coworker acceptance was positively correlated with Integration and Assimilation behavior and negatively correlated with Separation and Marginalization behavior, organizations should strive for systematic change that increases workplace inclusivity such that overall perceived acceptance rises. Such interventions have the potential to help organizations flourish and mitigate talent loss.

7. Limitations and future work

Our study has limitations, like all studies. The instrument relies on self-report data, bringing in an aspect of subjectivity to the data. For example, respondents had to define for themselves what it meant for coworkers to be "similar to" or "different from" them. However, despite this limitation, self-report measures are typically more

economical, scalable, and generalizable than direct measures and have been used with good validity in survey research (Paulhus & Vazire, 2007). Furthermore, measures in this study were vetted through a rigorous instrument development process (McCoach et al., 2013). Future studies could focus on customizing the survey instrument to focus on specific traits or qualities on which participants might be similar to or different from their coworkers, qualitatively understanding how respondents interpret the scale items, and/or developing observational methods to triangulate respondents' self-report behaviors. Despite strong initial support for the instrument's validity, there is also need for further testing of its constructs and items. All respondents in this study were working engineers and engineering alumni of the same institution. We recommend replicating the current study with larger, more nationally representative samples, as well as examining the applicability of the measures to other occupations. In addition, an examination of convergent and divergent validity and test-retest validity (Heale & Twycross, 2015; McCoach et al., 2013) would have strengthened this study and (in the latter case) helped extend the utility of the instrument for use in intervention. Structural equation modeling could also provide further theory-based evidence for the relationships proposed between constructs (McCoach et al., 2013). Lastly, it is important to note that because our data were cross-sectional, causality between variables was not actually determinable. Although we propose, based on Berry's (1997) model, that Importance of Retaining Own Values (IRV), Importance of Coworker Acceptance (ICA), and Perceived Acceptance from Coworkers (PA) are antecedents of Workplace Acculturation Behaviors, the nature of these relationships require continued investigation. For example, the presence or lack of PA could be both an antecedent and/or outcome of various behaviors. Longitudinal

study would provide a clearer understanding of how these measures influence one another.

Research directions for the instrument extend beyond further validation. For example, we see potential to use the instrument to study the impact of Workplace Acculturation Behaviors and their proposed antecedents on other employee and organizational outcomes, such as work satisfaction, job tenure, and organizational performance. There is also corresponding opportunity to explore how these relationships differentially play out for different groups of individuals (e.g., women, underrepresented racial/ethnic individuals, etc.). Lastly, scholars have acknowledged that acculturation is a complex process and that acculturating individuals may switch from one acculturation strategy from situation to situation (Berry, 2003; Navas et al., 2005). It may thus be of research interest to generate models that predict employee acculturation behavior in different situations and over time. We anticipate the results will provide useful insights with which employers and researchers can better advance the benefits of diversity and inclusion within the workforce.

CHAPTER 3

EXPLORING THE RELATIONSHIPS BETWEEN ACCULTURATION ATTITUDESAND DEMOGRAPHIC CHARACTERISTICS IN ENGINEERING WORKPLACES

1. Introduction

Several factors have contributed to increased focus on diversity and inclusion in workplaces in recent years (Green et al., 2020; Nair & Vohra, 2015; Tamunomiebi & John-Eke, 2020). A demographic shift driven by globalization, immigration, and diversification of the population has been underway in the U.S. such that no demographic group will be a clear majority in the nation by 2055 (Green et al., 2020; Holodny, 2015). Factors such as civil rights legislation prohibiting discrimination based on gender or race in hiring, promotion, and firing and changing family roles due to the need for families to have two incomes to maintain a middle-class lifestyle have also played a role (Catalyst. 2005). Yet, with its diversity index well below satisfactory, the engineering profession has grappled with increasing diversity and inclusion for decades with marginal success. Women comprise just 16% of the engineering workforce, engineers of Black/African American and Hispanic/Latin American descent comprise just 4% and 8%, and those identifying with other underrepresented racial/ethnic groups comprise even smaller percentages (National Science Foundation, 2021), for example. Notably, each of these groups lags behind their corresponding percentage in the general U.S. population.

A primary reason for the low representation of women engineers and engineers from underrepresented racial/ethnic groups engineers is an engineering culture that is toxic and non-conducive to these individuals (e.g., Douglas, Richardson & Dupuy, 2017; Faulkner, 2009a; Hatmaker, 2013; Rincon & Yates, 2018). Literature demonstrates that engineering culture prioritizes a specific set of values that privilege primarily White men only (Flood & Pease 2005; McIntosh, 2020). Non-White, non-male engineers must navigate biases, discrimination, disparities in pay and advancement, and lack of support based on their differences. For example, nearly fifty percent of women engineers and comparable percentages of engineers from underrepresented racial/ethnic backgrounds (Funk & Parker, 2018) report unfair or unequal treatment in the recruitment, hiring, evaluation, and promotion process due to their race and/or gender (Alegria, 2019; Frehill, 2007). Further, while reports of overt sexism and racism in engineering workplaces have decreased over the last three decades, incidents of more subtle forms of harassment, such as microaggressions, have grown (Faulkner, 2009a; Frehill, 2007). The adverse psychological effects of engineering work culture on women and underrepresented racial/ethnic individuals can include low job satisfaction, job performance, and job commitment (e.g., Douglas, Richardson, & Dupuy, 2017; Frehill, 2010; Rincon & Yates, 2018). Some cases result in individuals adopting adaptation strategies to cope with their treatment (Faulkner, 2009a; Hatmaker, 2013), and others result in the departure and loss of experienced talent (Fouad et al., 2011; Rincon & Yates, 2018).

However, when diversity is accepted and normalized within workplaces, advantages can include business profitability fueled by increased creativity, innovation, and productivity and social justice attainment that increases company attractiveness and

sustainability (Guillaume et al., 2013; Guillaume et al., 2017; Nair & Vohra, 2015; Suharnomo, Wahyudi, & Wikaningrum, 2017). Paramount to diversity research, then, is to help create more inclusive work environments that benefit individuals and organizations alike in the immediate and long-term future (Faulkner, 2009a). One way to accomplish this goal is by promoting greater acceptance of diversity on individuals' part. How employees act when they encounter physical diversity based on gender, race/ethnicity, and other differences in the workplace is affected by their personal values, preferences, and beliefs (Harrison, Price, & Bell, 1998; Roberson, Ryan, & Ragins, 2017). Green et al. (2020) support this notion, stating "diversity is not about differences among any groups, but rather about differences among individuals" (p. 2). Other researchers have underscored the importance of individual-level psychological variables to diversity dynamics in organizations as well (Romanenko, 2012).

Such attitudes reflect individuals' impressions and beliefs about people, objects, or issues (Hayden, 1988) and are often deeply ingrained during early life and last throughout adulthood (Parsons, Adler, & Kaczala, 1982). Connecting employees' attitudes about diversity to their prior socialization, Roberson et al. (2017) state that, "[E]mployees not only bring their personal experiences with them but generational and historical experiences from their families and social groups" (p. 495). The attitudes that are more popular or carry more weight at a certain level, such as a nation, organization, or work group, then become that shared culture at that level (Schwartz, 2006), a phenomenon which Hofstede (2010) generally refers to as "the collective programming of the mind" (p. 1). These links between diversity, early socialization, and culture provide

credible avenues for exploring attitudes in workplaces that may positively or negatively influence the efforts to increase organizational diversity.

This paper, therefore, examines engineers' acculturation attitudes about their workplace culture. We define acculturation attitudes as individuals' preferences for what should happen when different individuals or groups within a given culture interact (Sam & Berry, 2010). Our research questions are:

RQ1: What are the acculturation attitudes exhibited by working engineers?

RQ2: How are engineers' demographic characteristics related to these attitudes?

We answered these questions by analyzing the responses of 502 practicing engineers who graduated from a large, public university in the southwestern U.S. and completed an online survey. We performed a cluster analysis to classify the engineers according to their acculturation attitudes. We also conducted Chi-square tests of association to evaluate the relationships between engineers' acculturation attitudes and demographic variables. According to Romanenko (2012), "attitudes (towards diversity) can be changed, primarily through awareness, information, and contact, all of which can take place in awareness-based, skill-based, and mixed types of trainings" (p. 98). Findings in this study are expected to reveal patterns in engineers' acculturation attitudes that enable future research and interventions to accentuate the positive impacts of diversity within engineering workplaces.

2. Theoretical Underpinnings

This study investigates the acculturation attitudes of engineers using Berry's (2005) acculturation model. Berry originally developed this model to describe the

psychological acculturation (change and learning) that occurs when immigrants leave one cultural setting and reestablish themselves in another cultural setting. Since then, researchers have applied Berry's model to the study of immigrants' attitudes about intercultural workplace relationships with their coworkers with reliable results (Alkhazraji et al., 1997; Jian, 2012; Komisarof, 2009; Lu, Samaratunge, & Härtel, 2012; Oerlemans, & Peeters, 2010; Peeters, & Oerlemans, 2009). Still, others have proposed using the framework to study interactions between different groups of coworkers in general (Hood & Koberg, 1994; Malik & Manroop, 2017; McMillan & Lopez, 2001; McMillan-Capehart, 2005; Samnani, Boekhorst, & Harrison, 2012; Samnani, Boekhorst, & Harrison, 2013).

Berry's (2005) model features two orthogonal, bipolar dimensions: cultural maintenance (the importance that an individual places on retaining their heritage culture) and cultural adaptation (the importance that the individual places on making contact with and participating in mainstream culture). These acculturation preferences together form four acculturation attitudes: (1) Integration (high adaptation, high maintenance), (2) Assimilation (high adaptation, low maintenance), (3) Separation (low adaptation, high maintenance), and (4) Marginalization (low adaptation, low maintenance) (Berry, 2005).

Most engineers transition to their current positions from cultures that resemble their new ones, such as those embodied by engineering education or prior engineering work (Cech et al., 2011; Slaton, 2015). Thus, while, in this case, they may not be entering a new culture very different from their "heritage culture" in the same way immigrants do, they may be moving to a workplace in which their personal values align or do not align with the mainstream culture. Thus, in adapting Berry's model to engineering workplace

culture, we re-operationalized individuals' preferences for cultural maintenance as the Importance of Retaining Own Values (IRV), and cultural adaptation as the Importance of Coworker Acceptance (ICA). In this study, (1) Integration describes the desire to both retain one's individual values and be accepted by one's coworkers; (2) Assimilation describes the desire to be accepted by one's coworkers without the desire to retain one's individual values; (3) Separation describes the desire to retain one's individual values, without the desire to be accepted by one's coworkers; (4) Marginalization describes the lack of desire to retain one's individual values or be accepted by one's coworkers. Several of these acculturation attitudes can be problematic for workplace diversity. For example, attraction theory (Byrne, 1997) suggests a widespread worker preference toward Assimilation because it leads to stable and homogeneous work environments wherein expected behavior is clear, but such conditions allow for norms to perpetuate without examination, discussion, or challenge. Furthermore, widespread preference toward Separation risks the creation of silos that can weaken workplace cohesion, collaboration, and communication, while widespread preference for Marginalization can result in weak workplace culture that lacks goals or mission and lead to low employee job satisfaction, engagement, and retention.

By contrast, when most employees adopt an Integration attitude, the chances of diversity becoming an accepted feature of the overall workplace culture are expected to increase, leading to the multiculturalism of values, beliefs, and ideas that spawn creativity, innovation, equity, and inclusion (Guillaume et al., 2017; Guillaume et al., 2013; Suharnomo, Wahyudi, & Wikaningrum, 2017). Thus, maximizing the likelihood that engineers bring or are encouraged to develop an Integration attitude to their jobs

seems like a promising approach for increasing the diversity in the engineering workforce. We will determine which engineers are most likely to have this attitude in the results section.

3. Methods

This section describes our process for classifying engineers according to their acculturation attitudes, as determined by their acculturation preferences, and exploring differences in these attitudes based on their personal and job characteristics.

3.1 Participants

Data for this study was collected as part of a larger research project administered in Fall 2019 (Abhyankar & Brunhaver, 2019). Nearly twelve thousand alumni who earned engineering degrees from a large, public university in the southwestern U.S. within the past 15 years were invited to participate in an online survey via an initial invitation email and two reminder emails sent over the course of a two-week period. All participants had the option to enter a random drawing for a $50 Amazon gift card. A total of 747 alumni responded, 502 of which comprise the focal sample for the current analysis because they reported that they were employed as practicing engineers in industry (response rate: 4.3%). The personal and job characteristics for this group of respondents are summarized in Table 2.1 in Appendix B. (Note: participants who reported at least one of their races/ethnicities as American Indian/Alaska Native, Black/African American, Hispanic/Latin American, or Native Hawaiian/Other Pacific Islander were grouped

together as individuals from underrepresented racial/ethnic backgrounds for our analyses due to the small numbers of each group in our dataset.)

3.2 Measures

To gauge participants' attitudes about acculturation in workplaces, we used a two-dimensional acculturation preferences scale inspired by Berry's (2005) model. Participants responded to questions about the Importance of Retaining Individual Values (IRV) and the Importance of Coworker Acceptance (ICA). Each dimension has five items. An example IRV item was, "How important is it to you that at work: you follow your own principles?" An example ICA item was, "How important it is to you that at work: you are accepted by your colleagues?" A five-point unipolar response scale ranging from 1 = "not at all important" to 5 = "extremely important" was used for scoring each item. Cronbach's alpha of internal consistency reliability for the dimensions IRV and ICA were .86 and .85, respectively. More details about the development of this scale are available in Abhyankar and Brunhaver (2019).

3.3 Analysis

We conducted a two-step cluster analysis (IBM SPSS Statistics, 2016) in SPSS V.27 (IBM Corp., 2019) to identify the acculturation attitudes held by engineers in our sample. Two-step cluster analysis follows a two-step approach to group subjects into a smaller number of clusters based on similarities that data points within a cluster share (Chiu et al., 2001; Zhang, Ramakrishnan, & Livny, 1996). First, a pre-clustering step proposes different cluster solutions by sequentially clustering cases into existing or new

clusters based on a specified distance (similarity) criterion until all cases have been sorted; log-likelihood was used to measure cluster distance in this step (Chiu et al., 2001). Next, either a hierarchical clustering step can be used to determine the "best" number of clusters using the "elbow method" with choice fit criterion, in this case, the Bayesian Information Criterion (BIC); (Chiu et al., 2001), or a fixed, pre-specified number of clusters can be generated. Cluster seeds corresponding to the optimal or pre-specified number of clusters are generated, and all cases are assigned to the nearest cluster seed.

In addition to the BIC, we calculated a silhouette measure comparing how cases matched to their own cluster (cohesion) compared to other clusters (separation) as an additional determinant of the number of clusters in a dataset; values for silhouette range from-1 to +1, with more positive values preferred (Rousseeuw, 1987). Since clustering depends on the order of cases, we also repeated all analyses with cases sorted in different random orders to minimize order effects and determine which candidate solution was most stable (IBM SPSS Statistics. 2016). Lastly, we performed non-parametric Kruskal-Wallis tests with post-hoc Mann-Whitney U tests (Agresti, 2018) to confirm that the resultant clusters differed significantly from one another on IRV and ICA. After determining engineers' acculturation attitudes, we investigated whether these attitudes varied according to the personal and job characteristics shown in Table 2.1 in Appendix B using Chi-square tests of association (Agresti, 2018). We used a p-value of $p < .05$ to denote statistical significance, followed significant omnibus tests with post-hoc tests, and applied a Bonferroni correction in the post-hoc tests to adjust for multiple group comparisons (Agresti, 2018).

4. Limitations

Our study has several methodological limitations. The data collected were based on participants' own perceptions and, therefore, subject to self-report bias. This limitation was difficult to mitigate, as self-reporting is a quick and inexpensive mode of data collection. The availability of resources and time to adopt observational data collection techniques could counter implicit bias in future work. Another significant limitation was our low survey response rate, mainly related to underrepresented populations within engineering. American Indian/Native Alaskan, Black/African American, Hispanic/LatinX, and Native Hawaiian/Pacific Islander participants were all underrepresented compared to their percentages in the overall U.S. engineering population. This required that they be aggregated into a single group to meet minimum thresholds for analysis. However, scholars have advised caution when treating underrepresented racial/ethnic groups as monolithic (Bhatti, 2021) because it masks meaningful differences between groups, each of which deserve understanding in their own right (Bensimon, 2016). Motivating working engineers to participate in research activities can also be challenging. Possible ways to improve the response rates for future research would be to offer a greater number of more lucrative incentives, educate participants on the importance of the research for the field's overall betterment, send the survey from a recognizable, influential figure, and target recruitment materials to specific sub-populations (Perkins, 2011). Finally, cluster analysis is sensitive to the sequencing of input data, meaning that results can change depending on the order. At the same time, it can provide an excellent overview of the nature of data and the population distribution among clusters. We generated several lists of random orders to check that results stayed

relatively stable across runs and then randomly chose an ordering with which to conduct our analysis to prevent any specific sequencing.

5. Results

5.1 Cluster Analysis

We answered our first research question using a two-step cluster analysis (IBM SPSS Statistics. 2016). We began cluster analysis by allowing the number of clusters to be generated automatically and using the "elbow method" (Chiu et al., 2001) to suggest the optimal number of clusters. The elbow method plots the Bayesian Information Criterion (BIC) as a function of the number of clusters, where lower BIC values are preferred. Researchers suggest choosing the number of clusters corresponding to the largest decrease in BIC between consecutive points, typically denoted by the first "elbow." However, interpretation using this method can be highly subjective, so we chose a range of solutions for further examination. The plot comparing BIC against the number of clusters is shown in Figure 2.1. Based on Figure 2.1, we chose to further examine the two, three, four, and five-cluster solutions, shown in Figure 2.2.

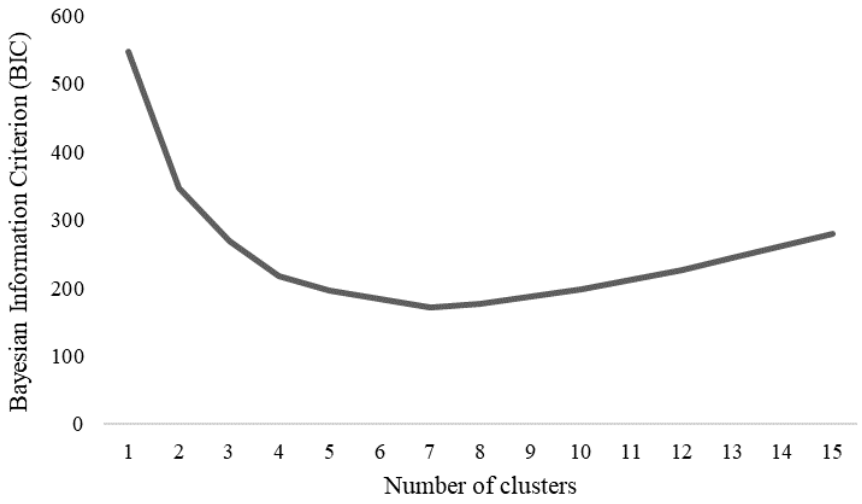

Figure 2.1: Bayesian Information Criterion (BIC) vs. Number of clusters

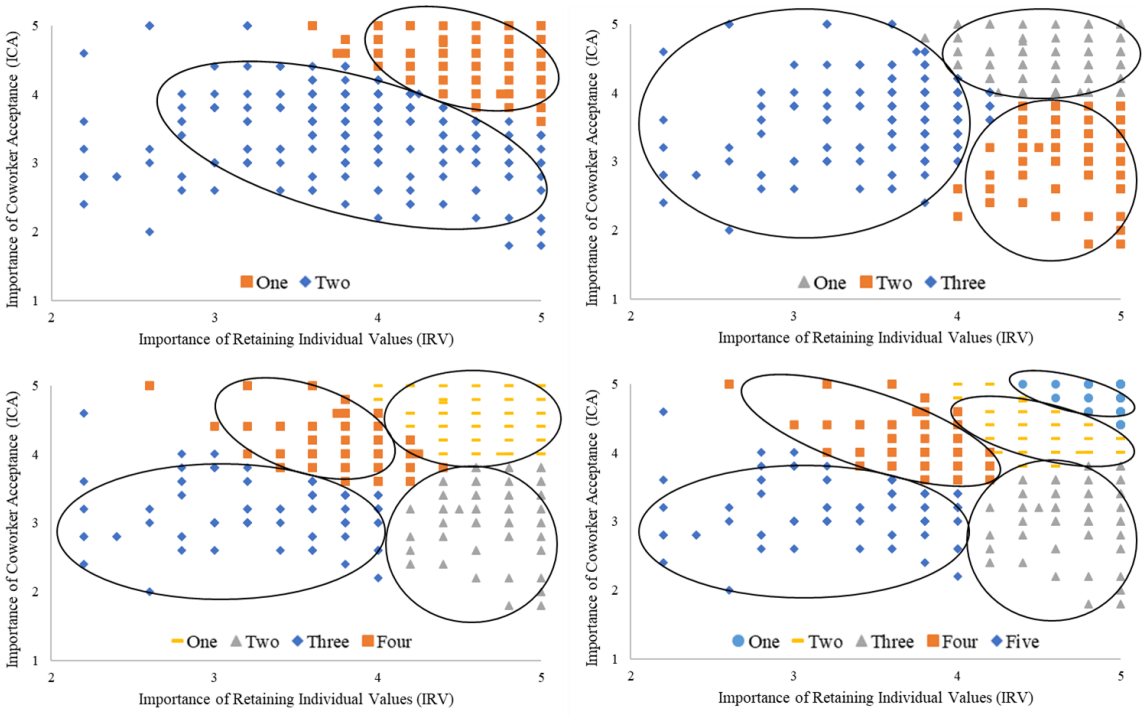

Figure 2.2: Two, three, four, and five-cluster solution

We ran each of the two, three, four, and five cluster solutions four times, using a different random ordering of cases each time. The range of silhouettes and size ratios for each solution across the four runs is shown in Table 2.2. Silhouette values ranged between .50-.55 (good; IBM SPSS Statistics. 2016) for all four runs of the four-cluster solution. The two-solution had silhouette values between .50 - .55 for three runs and between .45 - .50 (fair; IBM SPSS Statistics. 2016) for one run. The three and five-cluster solutions had silhouette values between .50 - .55 for just one run and between .45 - .50 otherwise. The four-cluster solution also had among the smallest average ratios of largest to smallest cluster (M = 2.32, SD = .55) and fit with Berry's model positing four acculturation attitudes (Komisarof, 2009), further supporting the four-cluster solution as the most optimal and most stable.

Table 2.2: Silhouette and size ratio criterion of fit for two, three, four, and five cluster solutions

Cluster Solution	**Range of Silhouette Values**	**Average (SD) Ratio of Largest to Smallest Cluster**
Two	.50 - .55 (3/4 runs), .45 - .50 (1/4 runs)	2.75 (.83)
Three	.50 - .55 (1/4 runs), .45 - .50 (3/4 runs)	3.22 (1.04)
Four	.50 - .55 (4/4 runs)	2.32 (.55)
Five	.50 - .50 (1/4 runs), .45 - .50 (3/4 runs)	2.02 (.81)

Table 2.3 provides descriptive statistics on IRV and ICA for the four-cluster solution. (Note: the numbering of the clusters shown in Table 2.3 corresponds with that of the clusters for this solution in Figure 2.2.) The engineers in our sample tended to skew toward placing high importance on both retaining their own values (IRV, M = 4.19, SD = .64) and being accepted by their coworkers (ICA, M = 3.94, SD = .70). However, relative

to each other, four quadrants mapping to the four acculturation attitudes in Berry's model (Berry, 2005) emerged: Cluster 1 – Integration (above overall sample mean on IRV and ICA), Cluster 2 – Separation (above overall sample mean on IRV, below overall sample mean on ICA), Cluster 3 – Marginalization (below overall sample means on IRV and ICA), and Cluster 4 – Assimilation (below overall sample mean on IRV and above overall sample mean on ICA).

Table 2.3: Importance of acculturation preferences for four cluster solution (n = 502)

Cluster	Percentage of Sample	IRV M (SD)	ICA M (SD)
1 – Integration	32.5%	4.73 (0.32)	4.60 (0.36)
2 – Separation	14.5%	4.71 (0.25)	3.16 (0.52)
3 – Marginalization	18.5%	3.38 (0.54)	3.18 (0.42)
4 – Assimilation	34.5%	3.89 (0.31)	4.06 (0.35)
Total	100%	4.19 (0.64)	3.94 (0.70)

We conducted Kruskal-Wallis tests (Agresti, 2018) on the two acculturation preference dimensions used to cluster cases as additional validation of the four-cluster solution. The results indicate a statistically significant effect of cluster membership on IRV [χ^2 (3, 502) = 380.0, $p < .001$] and ICA [χ^2 (3, 502)) = 368.0, $p < .001$], respectively. Post-hoc comparisons with Bonferroni correction revealed that all clusters significantly differed from one another ($p < .001$) except for the Integration and Separation clusters on IRV and the Separation and Marginalization clusters on ICA. Berry's model states that individuals with Integration and Separation attitudes should be similarly high on IRV, and individuals with Separation and Marginalization attitudes should be similarly low on ICA, which may help explain these anomalies.

5.2 Chi-square Analysis

We conducted omnibus Chi-square tests of association (Agresti, 2018) examining engineers' personal and job characteristics based on their acculturation attitudes (Integration, Separation, Marginalization, Assimilation). The results of these tests are presented in Table 2.4, with $p < .05$ denoting a statistically significant relationship between the personal or job characteristic and attitudes.

Table 2.4: Results of omnibus Chi-square tests: personal and job characteristics by cluster membership

Characteristic	**N**	**df**	**χ^2 statistic**	***p*-value**
Gender identity	492	3	17.11	0.001**
Racial/ethnic identity	470	6	17.40	0.008**
Immigrant status	478	6	14.85	0.02*
Age	497	12	13.49	0.335
Type of highest degree	502	6	5.35	0.500
Field of highest degree	497	24	28.874	0.225
Years since earning highest degree	496	12	11.56	0.481
Relationship status	488	3	3.26	0.354
Dependent status	491	3	3.44	0.328
Type of current position	500	9	8.12	0.523
Field of current position	502	21	25.75	0.216
Years worked in current position	502	12	20.02	0.067
Years worked in engineering	502	12	17.33	0.138
Size of work group	500	9	5.13	0.823
Percentage of women in work group	502	12	22.75	0.030*

* $p < .05$, ** $p < .01$

Our analyses revealed no significant differences in immigrant status, age, type and field of highest degree, years since earning highest degree, relationship status, dependent status, type and field of current position, years worked in current position and engineering in general, and size of one's work group by cluster membership ($p > .05$). We did, however, find significant relationships between cluster membership and gender

identity [$\chi^2(1, 492) = 17.11$, $p = .001$], racial/ethnic identity [$\chi^2(1, 470) = 17.40$, $p = .008$], immigrant status [$\chi^2(1, 478) = 14.85$, $p = .021$], and percentage of women in one's work group [$\chi^2(1, 502) = 22.75$, $p = .030$]. The distribution within clusters according to these four characteristics is shown in Table 2.5.

Table 2.5: Demographic characteristics comparison across clusters

		Cluster			
Characteristic	**All Participants (n = 502)**	**1 – Integration (n = 163)**	**2 – Separation (n = 73)**	**3 – Marginalization (n = 93)**	**4 – Assimilation (n = 173)**
Gender identity	**%**	**%**	**%**	**%**	**%**
Men	69.3	58.9	83.6	67.7	74.0
Women	28.7	39.3	15.1	28.0	24.9
All others*	2.0	1.8	1.4	4.3	1.2
Racial/ethnic identity (URM)	**%**	**%**	**%**	**%**	**%**
Asian/Asian American	29.5	33.1	15.1	20.4	37.0
American Indian/ Native American, Black/African American, Hispanic/Latin American, and Native Hawaiian/ Pacific Islander (combined)	14.5	16.0	16.4	14.0	12.7
White/European American	49.6	46.0	63.0	55,9	43.9
All others	6.4	4.9	5.5	9,7	6.4
Immigrant status	**%**	**%**	**%**	**%**	**%**
First-generation immigrant	26.3	31.9	13.7	18.3	30.6
Not a first generation immigrant or an immigrant	68.9	64.4	84.9	76.3	52.5
All others	4.8	3.7	1.4	5.4	6.9
Percentage of women in work group	**%**	**%**	**%**	**%**	**%**
0%	13.5	8.6	26.0	18.3	10.4
1 – 10%	32.3	33.1	30.1	29.0	34.1
11 – 25%	27.5	29.4	19.2	28.0	28.9
26 – 50%	21.1	20.9	21.9	17.2	23.1
More than 50%	5.6	8.0	2.7	7.5	3.5

*All others: missing or "preferred not to answer"

Post-hoc tests with a Bonferroni correction to adjust for multiple group comparisons (Agresti, 2018) were run for the analyses concerning gender identity, racial/ethnic identity, immigrant status, and percentage of women in one's work group. We present both the p-value and the odds ratio for each statistically significant result. An odds ratio represents the odds that an outcome will occur given a particular condition, compared to the odds of the outcome occurring in the absence of that condition (Agresti, 2018) (e.g., the odds or likelihood that an engineer identifying as a woman will report having an Integration attitude as compared to an engineer identifying as a man).

Our analyses revealed the following prominent results related to immigrant status, gender identity, racial/ethnic identity, and the percentage of women working in one's work group:

- **Gender identity:** Women engineers were 2.1 times more likely to be in the Integration cluster [χ^2 (1, 492) = 13.19, p < .001] and .4 times less likely to be in the Separation cluster [χ^2 (1, 492) = 7.96, p = .020] as compared to their male counterparts.
- **Racial/ethnic identity:** White/European American engineers were 2.0 times more likely to be in the Separation cluster than all other participants [χ^2(1, 470) = 6.08, p = .042], while Asian/Asian American engineers were .4 times less likely to be in the Separation cluster than all other participants [χ^2 (1, 470) = 9.06, p = .009].
- **Percentage of women in work group:** Engineers whose work group lacked women were 2.7 times more likely to be in the Separation cluster than all other participants [χ^2(1, 502) = 11.36, p = .005].

- **Immigrant Status:** First-generation immigrant engineers were .4 times less likely to be in the Separation cluster [χ^2(1, 492) = 7.99, p < .02] as compared to all other participants.

The finding that acculturation attitudes are gendered and racialized makes sense, given that socialization experiences themselves are gendered and racialized (Hofstede, 2001). We also acknowledge that socialization experiences are intersectional, influenced by combinations of identities that include gender and race (Brown, 2017; Davis Tribble, 2019). Men and women of various racial/ethnic backgrounds will each have different socialization experiences based on differences in the power and privilege afforded them through life (Flood & Pease, 2005 ; McIntosh, 2020), which may, in turn, generate different attitudes about acculturation and work. We tested for relationships between gender x racial/ethnic identity and cluster membership to investigate these attitudes further (Table 2.6). Our results revealed that White/European American men were .5 times less likely to be in the Integration cluster [χ^2(1, 467) = 12.62, p = .006] and 2.8 times more likely to be in the Separation cluster [χ^2(1, 467) = 15.91, p < .001] than all other participants.

Table 2.6: Gender x racial/ethnic identity by cluster membership

	All Participants (n=502)	Cluster			
		1 – Integration (n=163)	2 – Separation (n=73)	3 – Marginalization (n=93)	4 – Assimilation (n=173)
Gender x race/ethnic identity	**%**	**%**	**%**	**%**	**%**
Asian/Asian American men	21.3	23.9	12.3	17.2	24.9
Asian/Asian American women	7.8	9.2	2.7	3.2	11.0
American Indian/ Native American, Black/African American, Hispanic/Latin American, and Native Hawaiian/ Pacific Islander men (combined)	10.6	8.6	13.7	10.8	11.0
American Indian/ Native American, Black/African American, Hispanic/Latin American, and Native Hawaiian/ Pacific Islander women (combined)	4.0	7.4	2.7	3.2	1.7
White/European American men	34.1	23.9	54.8	35.5	34.1
White/European American women	15.3	21.5	8.2	20.4	9.8
All others*	7.0	5.5	5.5	9.7	7.5

*All others: missing or "preferred not to answer"

6. Discussion

This study identifies practicing engineers' workplace acculturation attitudes based on their preferences for retaining their individual values and being accepted by their coworkers at work, then investigates differences in engineers' personal and job characteristics according to their attitudes. The engineers in this sample generally scored

high on the Importance of Retaining Own Values (IRV) and the Importance of Coworker Acceptance (ICA). These traits indicate an Integration attitude according to Berry's acculturation model, which aligns with previous studies' findings that most acculturating individuals - which all employees within an organization are - prefer an Integration strategy to workplace acculturation (Berry, 2005; Berry, 2003; Neto, Barros, & Schmitz, 2005). At the same time, a two-step cluster analysis grouped participants into four groups corresponding with Berry's four acculturation attitudes (Berry. 2005) relative to each other. These groups were, from the highest percentage of participants to the lowest, Assimilation (35%), Integration (33%), Marginalization (19%), and Separation (15%).

Chi-squared tests of association allowed a more nuanced understanding of the kinds of participants in each attitudinal cluster and what that might tell us about their past and current socialization experiences. Two noteworthy findings emerged around gender identity. First, women engineers had a higher likelihood of exhibiting an Integration attitude and a lower likelihood of exhibiting a Separation attitude than men, corroborating similar findings from other researchers (Fox et al., 2013; Nesdale, Rooney, & Smith, 1997; Yu & Wang, 2011). Second, engineers who reported a lack of women in their work group were more likely to report having a Separation attitude than all other participants. In other words, we can say that men who work with more women are more likely to place importance on both retaining their own values and fitting in with their coworkers relative to other participants.

Some scholars suggest that individuals who enter the workplace identifying with the mainstream culture undergo a process of enculturation (learning the norms and practices

of another group) (Sam, 2006), and may not feel the same pressures to be accepted because they are already seen as fitting in with the group. Engineering culture is predominantly masculine, prioritizing masculine-typed work traits and affords male privilege to engineering men (Flood & Pease 2005). It makes sense for men engineers to ascribe low importance to coworker acceptance if they take that acceptance for granted or see it as orthogonal to accomplishing their professional goals or work tasks. Men engineers with no women coworkers having Separation attitudes similarly makes sense if one assumes that low importance on coworker acceptance also translates into low conferral of coworker acceptance. Women who feel out of place or a lack of belonging may opt to eventually leave their workplace or never enter in the first place (Fouad et al., 2011). Conversely, because women are not automatically afforded acceptance at work and generally find engineering work culture toxic and non-conducive to their success, it is easy to see why the ability to be accepted while being themselves (i.e., an Integration attitude) would be important.

Our analyses revealed additional findings related to racial/ethnic identity. For example, White/European American engineers had a statistically higher (63.0%), and Asian/Asian American engineers had a statistically lower (15.1%) likelihood of being in the Separation cluster than all other engineers. This result may be explained in part by Hofstede, Hofstede, and Minkov (2010), who illustrate that people from European backgrounds tend to be more individualistic than collectivistic relative to those from Asian backgrounds. Asian/Asian American engineers instead had a greater likelihood of being in the Assimilation (37.0%) and Integration (33.1%) clusters relative to all other

engineers, although neither of these effects rose to the level of significance - this pattern held for both men and women.

When looking at gender and racial/ethnic identity, it also becomes clear that White/European American engineers tend to exhibit a Separation attitude driven by White/European American men rather than White/European American men and women. The Separation cluster had the highest percentage of White/European American men (54.8%) and the lowest percentage of White/European American women (8.2%) than any other cluster. Meanwhile, the Integration cluster had the highest representation of White/European American women (21.5%) and women from underrepresented racial/ethnic groups (7.4%). Once again, we attribute these differences to differences in privilege and, this time, White male privilege (Faulkner, 2009a). White men often enjoy certain benefits as the overrepresented group within engineering, such as belonging implicitly without consciously thinking about being accepted. Lastly, we note that we discovered no statistically significant findings about men or women from underrepresented racial/ethnic group (i.e., not significantly more or less likely to be in a particular cluster than all other groups). This could indicate either insufficient power to detect significant effects due to small group sizes or the true absence of a relationship. A more nuanced study of gender and racial/ethnic identity-related distribution patterns across acculturation may shed light on this finding and is recommended for the future.

Considering the immigration status of engineers, our analysis revealed that among the four acculturation attitudes, first-generation engineers were represented in relatively higher percentages of 32% and 31%, respectively, in the Integration and Assimilation clusters. Prior studies have revealed that immigrants, in general, have a clear preference

for the Integration attitude (Berry et al., 1989); however, in our study, it did not rise to the level of significance. This could be because immigrants are not a monolithic group and will have different acculturation attitudes based not just on their immigration status but their culture of origin. Our study also revealed that the likelihood of first-generation engineers being in the Separation cluster was .4 times lower than that of the other participants. Combined with the finding of stronger representation of first-generation engineers in the Integration and Assimilation clusters, this could indicate a desire among the first-generation immigrants to be accepted in the mainstream. An in-depth study examining acculturation attitudes of engineers and their immigration status may shed further light on the subject.

7. Implications and Future Work

The current study carries several implications for engineering hiring, training, and education. The engineering workforce is predominantly White and male, which our work suggests has a high association with having a Separation attitude at work, i.e., preferring to retain one's individual values without necessarily caring about coworker acceptance. Separatist-type environments could pose problems for organizations wanting to increase their diversity. Propagating the status quo leaves little room for diversification. Our findings have the potential to help align engineering organizations' practices with their recruitment and hiring goals instead. For example, an organization wanting to increase its diversity could recruit not only individuals with visible differences but those motivated to integrate their individual values with their desire to fit in and be a team player within

their workplace. Employers could screen potential engineers for such attitudes through hiring questionnaires or interview questions.

Since attitudes are malleable and, in turn, shape actions and behaviors (Ajzen, 1991; Berry, 2005), the insights from this study could also be leveraged to develop targeted interventions that improve working engineers' acculturation attitudes. Targeted interventions such as training have been shown to influence employee attitudes and can be used to help navigate specific groups of engineers towards an Integration attitude or away from a Separation one. Training in group empathy and self-awareness could help engineers (particularly White male engineers) recognize their privilege and how important coworker acceptance may be to colleagues. Such training has been demonstrated to be especially successful when involving role-playing, stories, letters, videos, and vignettes (Sirin, Villalobos, & Valentino, 2016; Weisz & Zaki, 2017). Some research suggests that single touchpoints may not be enough to perpetuate sustained change in these outcomes (Borrego & Henderson, 2014), however, emphasizing the need to embed such training into engineers' regular professional responsibilities rather than relegate it to (for example) just on-boarding.

Lastly, our study findings could be incorporated into educational institutions at all levels. Research shows that people's attitudes about empathy and intercultural sensitivity begin developing early and are influenced by parents, peers, intergroup friendships, and schooling (McDonald & Messinger, 2011; Miklikowska, 2017). Within engineering education, critically examining the hidden curriculum (Redish, 2010; Tonso, 2002) for instances that reinforce Separation, Assimilation, and Marginalization attitudes and

reimagining them to promote Integration could lead to greater acceptance of a more diverse range of individuals among future generations of engineers.

Regarding future research, acculturation attitudes are one factor within a bigger picture of acculturation dynamics. Berry's framework additionally posits that acculturation attitudes combine with individuals' perceived acceptance from the mainstream culture to influence their adaptation behaviors (Berry, 2005). Future research could investigate how engineers enact their acculturation attitudes at work, such as through their social interactions with coworkers, and how perceived acceptance from their coworkers moderates this relationship. Still, other research could examine engineers' acculturation attitudes for connections with their job and career outcomes. We anticipate that these analyses, together, would provide a complete holistic picture of engineering workplace acculturation dynamics.

CHAPTER 4

ASSESSING GENDERED WORKPLACE BEHAVIOR THROUGH AN ACCULTURATION LENS: PROPOSED MODEL AND TESTING

1. Introduction

Despite the rising number of women with engineering degrees (SWE, 2018), research highlighting the better performance of gender-balanced teams (Bear & Woolley, 2011; Woolley et al., 2010), and proven benefits of diversity in the workforce (Guillaume et al., 2017; Nair & Vohra, 2015; Suharnomo et al., 2017), the underrepresentation of women in engineering continues to be an issue. The proportion of women in engineering has stagnated below 16% over the past two decades (National Science Foundation, 2019). A closer look at the percentages of women in different engineering disciplines reveals further disparity among fields. For example, disciplines such as chemical, civil, and industrial engineering have over 18% women engineers, while fields like mechanical and electrical engineering have about 8% to 10% women engineers (NSF, 2017). Of the women who join engineering about 40% leave the profession between 5-8 years of entering the field (Society of Women Engineers, 2016b). Of the women who leave, 30% cite the workplace culture as a reason for their departure (Society of Women Engineers, 2016a), and myriad literature demonstrates women's characterization of the male-dominated engineering workplace as toxic (Bastalich et al., 2007; Dryburgh, 1999; Frehill, 2008; Seron et al., 2016) . Researchers have concluded that the experiences of women who leave and who persist in engineering are similar, with both mentioning the

masculine workplace culture as an issue (Buse et al., 2013; Fouad et al., 2020). Differentiating these two groups is that the women who persist generally adopt adaptation strategies with which to cope with their toxic environment (Ayre et al., 2013; Buse et al., 2013), with Hatmaker (2013) delineating these strategies as women portraying themselves to be "conceptual men" (i.e., minimizing their feminine traits to fit in), proving themselves to be as competent as their male counterparts, blocking offensive behavior, and rationalizing the behavior away. Still, others build emotional support networks with those they feel comfortable with (Fernando, Cohen, & Duberley, 2018; Khilji & Pumroy, 2019; Schmitt, 2021). Scholars note that the women who adopt these strategies are more likely to persist because the profession normalizes, encourages, and rewards such behavior (Hatmaker, 2013; Male et al., 2018), making their adoption necessary to "fit in". These scholars criticize this need, arguing that it perpetuates women's underrepresentation in the field. As Faulkner (2011) puts it, "[t]hese subtle gender normative dynamics can significantly undermine the retention and progression of women in engineering" (p. 1). Miller (2004) expresses a similar sentiment, saying that the strategies that women have needed to develop to survive and thrive in engineering workplaces have been "double-edged" (p. 47) because they simultaneously have enabled some women to get ahead while doing nothing to change the status quo. Miller (2004) further describes women engineers as having "undergone a long process of acculturation, beginning in engineering schools and then in organizations dominated by engineers" wherein they learned that "success in engineering, and in their organizations, meant accepting traditional male values and behaving consistently with them" (p. 55). Taken

together, these quotes demonstrate how and why engineering has maintained its masculine culture with low representation of women for over two decades.

It is interesting to note that Miller (2004) uses acculturation to describe how women adapt to male-dominated engineering workplaces. According to Berry (1997), acculturation occurs when individuals from distinct cultures or contexts interact on a regular basis. Originally developed to study migrants, Berry's (1997, 2005) model of acculturation describes four patterns of behavior (Integration, Assimilation, Separation, and Marginalization) that individuals take when transitioning from one context to the next, depending on their beliefs and preferences. In this paper, we use Berry's framework to examine men and women engineers' acculturation experiences in the workplace and gain a deeper understanding of the reasons for women's underrepresentation in engineering. Although all engineers undergo acculturation as they join an organization or take on a new role, we posit that the process and its outcomes differ for men and women, with women's experiences more akin than men's to those of traditionally acculturating individuals, i.e., migrants. Women engineers' acculturation is twofold. They adjust to being engineers in their role/organization (Huff et al., 2019; Polach, 2004; Powell, 2009), and they adjust on the gender front, as an underrepresented gender group within a male-dominated workplace (Hatmaker, 2013; Miller, 2004; Powell, 2009). As noted by Miller (2004), this dual process of gender and engineering acculturation starts even before women enter the workforce (Leaper & Friedman, 2007) and continues throughout their careers as they vie for equal status with engineering men (Berry, 1997). Women engineers' adaptation strategies are an outcome of this dual acculturation process (Powell, 2009), which needs closer attention if the research community is to propose

systemic-level approaches that mitigate the need for such coping strategies in the first place. Berry (1997) supports this idea, stating that gender "has a variable influence on the acculturation process [and] there is substantial evidence that females may be more at risk for [acculturation-related] problems than males" (p. 22). He further notes that this is particularly true when women encounter resistance to working in traditionally accepted male roles, such as engineering and management.

Berry's (1997, 2005) acculturation framework helps understand how engineering organizations wishing to reap the rewards of a gender-balanced workforce can move beyond simply recruiting more women to enact real change. First, it provides terminology with which to characterize and evaluate women engineers's adaptation strategies. While some women integrate by blending their identities as women and engineers, others assimilate (i.e., give up their unique feminine traits to fit into the masculine culture), separate, and marginalize themselves from or become marginalized by their male colleagues (e.g., Humphrey, Nahrgang, & Morgeson, 2007; Turner & Onorato, 1999; Watts, 2010). Berry's (1997, 2005) framework also provides a way to make sense of why different individuals engage in different adaptation strategies – because of factors related to their importance of retaining own values, importance of being accepted, and actual perceived acceptance. Organizational research provides support for each of these factors. For example, studies show that how individuals interact with others generally depends on the interplay between their desire for individual distinctiveness (Fromkin & Snyder, 1980; Vignoles, Chryssochoou, & Breakwell, 2000) and their desire for social acceptance (Baumeister & Leary, 1995; Deci & Ryan, 2000; Maslow, 1968), the exact value on each of which stems from their cumulative socialization experiences (Ajzen, 2012; Byrne,

1997). Other studies reveal that a significant motivator of whether an individual engages with a group is their desire to connect with others and feel accepted by the group (Ashforth, Harrison, & Corley, 2008; Rochford, 2013). Thus, support for Berry's applicability to studies of the workplace is well-founded in the extant literature.

Researchers have used Berry's model to study immigrant workers' acculturation experiences (Jian, 2012; Komisarof, 2009; Oerlemans & Peeters, 2010) and outcomes (Alkhazraji et al., 1997; Lu, Samaratunge, & Härtel, 2012, 2016; Peeters & Oerlemans, 2009; Valenzuela et al., 2020) with reliable results. The framework has also been applied to study the interactions of other types of workers (Hood & Koberg, 1994; Malik & Manroop, 2017; McMillan & Lopez, 2001; McMillan-Capehart, 2005; Samnani et al., 2012). For example, Hood and Koberg (1994) proposed using Berry's model to study women in male-dominated occupations with the premise that, "[w]omen moving into the traditional organizational or business culture are comparable with immigrants merging or fusing into a different society or country" (p. 3). Indeed, women engineers resemble traditional acculturating individuals in their daily decisions about how they acculturate to the gender-segregated engineering workplace and the gendered acculturation process that follows. However, it is worth noting that the model proposed by Hood and Koberg (1994) has not yet been instrumented or operationalized.

The current studyutilizes Berry's framework to examine men and women engineers' workplace acculturation behaviors, More specifically, this study sets out to determine whether men and women's acculturation behaviors and the factors that influence them (Importance of Retaining Own Values, Importance of Coworker

Acceptance, and Perceived Acceptance from Coworkers) are similar or different for the two genders, thus necessitating comparison (Fouad et al., 2020). While previous qualitative literature has shined light on women's adaptation strategies in engineering workplaces, it is unknown whether men engage in the same or similar behaviors as women, and for the same causes. If they do – if men engineers similarly engage in coping strategies such as assimilation and separation or are marginalized due to reasons relating to a toxic engineering culture – this would point to a larger issues within engineering affecting both genders. However, if they don't – if women as compared to men primarily engaged in these strategies – results from this study could inform continued, systemic-level efforts to make engineering workplaces more gender equitable.

2. Theoretical Framework

Berry (1997, 2005) created his acculturation framework to explain the behaviors of individuals migrating from one culture or context to another. He proposes that the acculturation behaviors, or strategies, of these individuals are influenced by two orthogonal acculturation preferences, i.e., their preference for maintaining their original norms and values (self-maintenance), and their preference for adopting the norms and values prevalent in their new context (self-adaptation) (Berry, 1997, 2005). He further posited that four possible acculturation strategies emerge depending on individuals' importance of self-maintenance and adaptation. According to Berry, Integration will likely occur when individuals wish to merge their original norms and values (high self-maintenance) with the new norms and values they encounter (high self-adaptation). Assimilation will likely occur when individuals willingly give up their original norms and

values (low self-maintenance) to embrace the new norms and values they encounter (high self-adaptation). Separation will likely occur when individuals adhere to their original norms and values (high self-maintenance) and eschew the new norms and values they encounter (low self-adaptation). Finally, Marginalization will likely occur when individuals lack interest in both retaining their original norms and values (low self-maintenance) and adopting the new norms and values they encounter (low self-adaptation).

Importantly, Berry's (1997, 2005) framework presumes that the acculturating individual can act freely according to their acculturation preferences and adopt any strategy they see fit. In reality, the correspondence between acculturation preferences and acculturation behaviors is not one-to-one, the discrepancy between which can be attributed to lack of acceptance within their new context (Navas et al., 2005; Sam & Berry, 2010). Whereas higher levels of perceived acceptance are typically associated with Integration behavior, lower levels are associated with Assimilation, Separation, and Marginalization behaviors. Thus, acculturation behaviors result from the interplay between acculturation preferences and perceived acceptance. Furthermore, acculturation preferences and perceived acceptance themselves have a complex relationship and have been shown to be correlated with one another (van de Vijver et al., 2016).

Figure 3.1 illustrates Berry's acculturation framework adapted to the study of women and men engineers in the workplace. The preference for self-maintenance is operationalized in this study as the importance an engineer assigns to upholding and acting according to their own values, principles, and beliefs, i.e., Importance of Retaining Own Values (IRV). The preference for self-adaptation is operationalized as the

importance an engineer assigns to being welcomed and included by their coworkers, i.e., Importance of Coworker Acceptance (ICA). Perceived acceptance is conceptualized as an engineer's actual perceptions of being welcomed and included by their coworkers, i.e., Perceived Acceptance from Coworkers (PA). Lastly, we conceptualize acculturation behaviors as the way engineers approach interaction with their coworkers. Integration behavior is defined as interacting with coworkers both similar to and different from oneself with equal ease. Assimilation behavior is defined as downplaying distinguishing characteristics and making a concerted effort to fit in with coworkers. Separation behavior is defined as interacting primarily with coworkers perceived to be similar to oneself, and Marginalization behavior is defined as minimizing interactions with coworkers, essentially secluding oneself. Taken as a whole, the framework undergirds the research question,

RQ: How and to what extent do workplace acculturation preferences and perceived acceptance from coworkers mediate the workplace acculturation behaviors of men and women engineers?

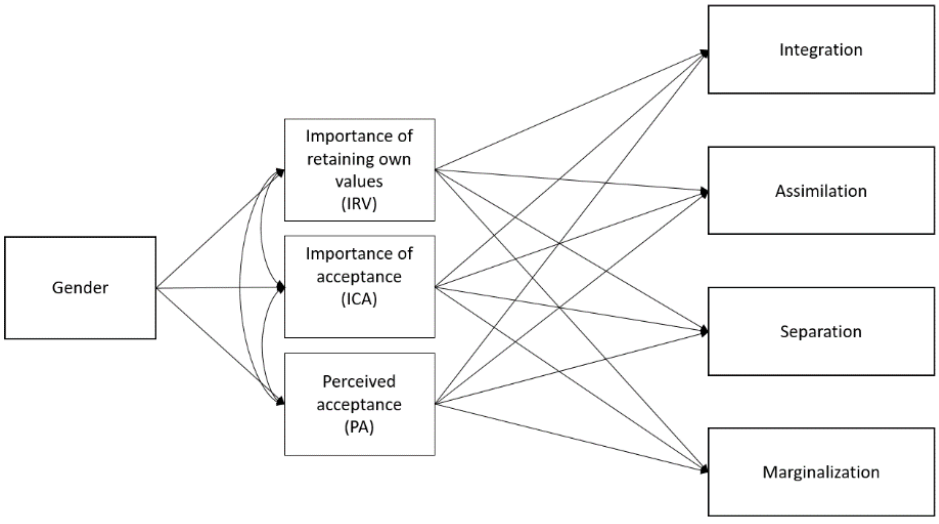

Figure 3.1: Proposed gendered workplace acculturation model with IRV, ICA, and PA shown mediating the relationship between gender and workplace acculturation behaviors

3. Methods

3.1. Procedures

Data for this study were collected in the Fall of 2019 as a part of a larger instrument development effort (Abhyankar & Brunhaver, 2022) by inviting nearly 12,000 engineering alumni of a large, public university in the southwestern U.S. to complete an online survey. The invitations were sent as an email, followed by two reminders sent over the course of two weeks. In addition, all participants had the option to enter a random drawing for a $50 Amazon gift card.

3.2. Participants

A total of 747 participants responded (response rate: 6.3%), 502 of which were practicing engineers and comprise the focal sample for the current analysis. The sample comprised of 348 (69.3%) men and 144 (28.7%) women, with no gender information available for 10 (2%) participants. Participants also identified as White (50%), Asian/Asian American (30%), Hispanic/Latinx (7%), Black/African American (1%), American Indian/Native Alaskan (1%), and multiple or "other" races/ethnicities (7%), with no racial or ethnic information available for 4% of participants. Most participants were between 21-30 years old (52%), followed by 31-40 years old (38%) and 41 years or older (10%). All participants had earned engineering degrees within the last 15 years. Fifty percent had earned a bachelor's degree as their highest degree, 39% had earned a

master's or professional degree as their highest degree, and 12% had earned a doctoral degree. Participants tended to have less than seven years of work experience (60%) and were employed in a variety of disciplines, among them, electrical and electronics engineering (18%), computer science/engineering (15%), mechanical engineering (12%), civil engineering (8%), aerospace, aeronautical, and astronautical engineering (8%), bioengineering and biomedical engineering (8%), industrial and manufacturing engineering (7%), software engineering (6%) and "other" engineering, including chemical, construction, management, general, environmental, materials, metallurgical, and nuclear engineering (18%).

3.3. Measures

Three scales based on Berry's (1997, 2005) acculturation framework were used to study the influence of workplace acculturation preferences and perceived acceptance from coworkers on engineers' workplace acculturation behaviors. Full details about the development of these scales are available in Abhyankar and Brunhaver (2022).

3.3.1. Workplace Acculturation Preferences

To measure workplace acculturation preferences, participants answered questions about the Importance of Retaining Individual Values (IRV) and the Importance of Coworker Acceptance (ICA). Both scale dimensions had five items each. A five-point unipolar response scale ranging from 1 = "not at all important" to 5 = "extremely important" was used for scoring each item. An example IRV item was, "How important

is it to you that at work: you act according to your own values?" An example ICA item was, "How important it is to you that at work: you have supportive coworkers?" IRV and ICA had Cronbach's alpha values of .88 and .89, respectively.

3.3.2. Perceived Acceptance from Coworkers

The Perceived Acceptance from Coworkers (PA) scale had six items and was measured on a five-point Likert response scale ranging from 1 = "strongly disagree" to 5 = "strongly agree." The items were prefaced with the direction, "Please indicate your level of agreement with each of the following statements about your experiences at work," and an example item was, "I feel accepted by my coworkers." The PA scale had a Cronbach's alpha value of .90.

3.3.3. Workplace Acculturation Behaviors

We measured Workplace Acculturation Behaviors using a four-dimensional scale measuring the four acculturation behaviors posited by Berry: Integration behavior (e.g., "I socialize easily with people both similar and different from me."), Assimilation behavior (e.g., "I prioritize acting like the majority to belong"), Separation behavior (e.g., "I try to work only with people who are like me"), and Marginalization behavior (e.g., "I do not interact with any coworkers unless I have to"). Participants were asked to rate their level of agreement with each item related to their experiences at work. A five-point Likert response scale ranging from 1 = "strongly disagree" to 5 = "strongly agree" was

offered. Cronbach's alpha values for this scale ranged from .76 for Integration and Assimilation to .83 for Separation and Marginalization.

3.4. Analysis

Path analysis was run on our focal sample data to investigate the influence of gender on workplace acculturation behaviors, as mediated by workplace acculturation preferences (IRV and ICA) and perceived acceptance from coworkers (PA). The path model was built based on the theoretical framework in Figure 3.1, which was, in turn, informed by the constructs and relationships in Berry's (1997, 2005) acculturation model. We used traditional indices of good model fit to evaluate the fit of our data to the path model, including a non-significant chi-square statistic, root mean square error of approximation (RMSEA) less than .10, comparative fit index (CFI) greater than .90, and standardized root mean square residual (SRMR) less than .08 (Browne & Cudeck, 1993; Hu & Bentler, 1999). Before running path analysis, we also examined the data to ensure that all prerequisite conditions of path analysis were met (Barbeau et al. 2019; Weston & Gore, 2006). There was no evidence of non-normality in the data. All univariate skewness and kurtosis values were well below the recommended maximum thresholds of 2.0 and 7.0, respectively (Curran, West, & Finch, 1996). While there was some missingness in the data, we conducted our analyses using full information maximum likelihood estimation in Mplus version 8.2 (Muthén & Muthén, 2018) because it adjusts for, rather than deletes, cases that contain missing data (Byrne, 1994; Hu & Bentler, 1999). There were 26 outliers with absolute Z-scores above 3.0. While eliminating outliers risks introducing statistical bias into the data and undervaluing the outliers,

retaining outliers risks including unreal data and overvaluing the outliers (Aguinis et al., 2013; Gosh & Vogt, 2012). To select between these options, and since there were no similar prior studies available to compare findings, we conducted path analysis with and without the outliers and discovered that the sample with all data points included produced a better model fit than the sample without the speculated outliers. We thus decided to retain all data points. Lastly, our sample size put us within the limits of 10-20 cases per estimated parameter (Kline, 1998).

3.5. Limitations

Our study has several methodological limitations. The data collected were based on participants' own perceptions of the items asked and, therefore, subject to self-report bias. Further development of some items to better define what they mean for participants (e.g., what it means for a coworker to be "similar to" or "different from" oneself) could help mitigate this limitation in future work. Participants in this study were engineering alumni from the same institution and, as such, may share common perspectives; however, we believe there was sufficient variation in participants' backgrounds and work experiences to ensure generalizability of the findings. Motivating working engineers to participate in research activities can be challenging. Possible ways to improve future response rates include offering a greater number of more lucrative incentives, educating participants on the importance of the research, sending the survey from a recognizable, influential figure, and targeting recruitment materials to specific sub-populations (Saleh & Bista, 2017; Parkins, 2011). Lastly, while our theoretical framework assumes that workplace acculturation preferences and perceived acceptance from coworkers are

antecedents of workplace acculturation behaviors, the causality of these relationships requires further investigation through longitudinal study.

4. Results

The means, standard deviations, and intercorrelations of the measured variables are presented in Table 3.1. Our sample, on average, rated IRV and ICA as very important, generally agreed that they felt accepted by their coworkers, and were most likely to rate themselves as engaging in Integration behavior. We note positive, significant correlations between IRV, ICA, and PA with Integration behavior. These observations align well with Berry's (1997, 2005) acculturation model and previous study findings that acculturating individuals typically prefer to Integrate as they acculturate into a new culture or context (Berry, 2003, 2005). We also note positive, significant correlations between IRV, ICA, and PA, as borne out by theory and literature (Sam & Berry, 2010; van de Vijver et al., 2016).

Table 3.1: Means, standard deviations, and intercorrelations of the measured variables

S.N.	Factor	M	SD	1	2	3	4	5	6	7
1	IRV	4.20	.64	-	.32**	.28**	.34**	-.07	-.04	.00
2	ICA	3.94	.70		-	.41**	.25**	.28**	.11*	-.09*
3	PA	4.01	.61			-	.49**	-.08	-.01*	-.28**
4	Integration	4.09	.49				-	-.02	-.29**	-.26**
5	Assimilation	2.66	.74					-	.51**	.36**
6	Separation	2.27	.76						-	.59**
7	Marginalization	2.43	.85							-

** Correlation is significant at .001 level (2-tailed), * Correlation is significant at .05 level (2-tailed)

The results of the path analysis are presented in Figure 3.2. Statistically significant paths and non-significant paths are shown as solid and dashed lines, respectively. Goodness-of-fit indices indicate excellent fit of the model to the data

(RMSEA = .05, CFI = .99, SRMR = .03, $\chi 2(4) = 8.6$, p = .071). We present our findings in terms of direct and indirect effects.

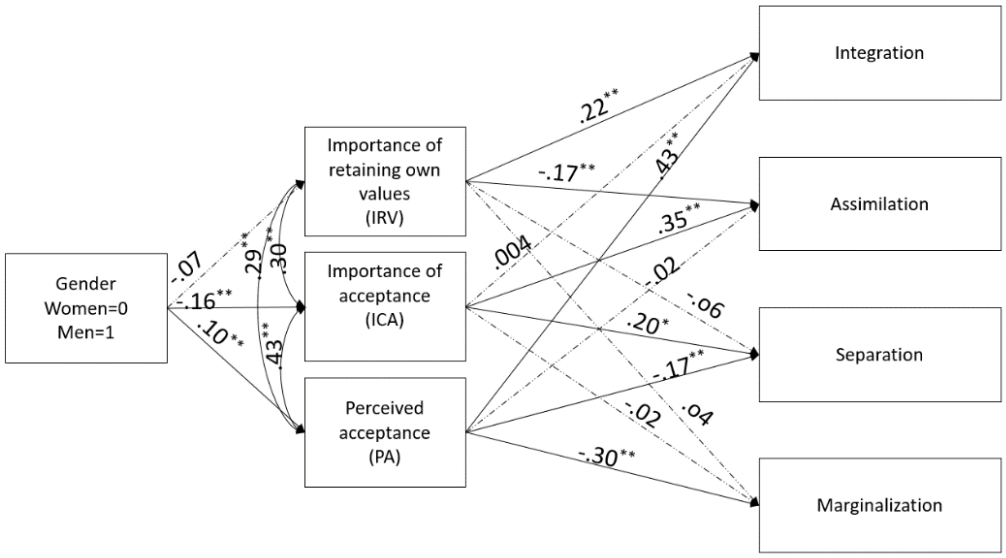

Figure 3.2: Path analysis results: Gendered workplace acculturation model with standardized path coefficients; ** path coefficient is significant at .001 level (2-tailed), * path coefficient is significant at .05 level (2-tailed)

4.1. Direct effects

Our results show that gender was a significant predictor of ICA and PA. Compared to women engineers, men engineers placed lower value on being accepted by coworkers ($\beta = -.16$, $p < .001$) while at the same time perceiving greater acceptance from them ($\beta = .10$, $p = .033$). Being a man, versus a woman, engineer was also associated with placing lower value on IRV, but this prediction coefficient was small and did not rise to the level of statistical significance.

Our path model also reveals that IRV positively predicted Integration behavior ($\beta = .22$, $p < .001$) and negatively predicted Assimilation behavior ($\beta = -.17$, $p < .001$). ICA

positively predicted Assimilation behavior (β = .35, p < .001) and Separation behavior (β = .20, p < .001). PA positively predicted Integration behavior (β = .43, p < .001) and negatively predicted Separation behavior (β = -.17, p = .001) and Marginalization behavior (β = -.30, p < .001). All other paths from IRV, ICA, and PA to workplace acculturation behaviors were non-significant.

4.2. Indirect effects

An analysis of the indirect effects of gender on workplace acculturation behaviors revealed two major findings. First, being a man, versus a woman, engineer positively predicted Integration behavior (β = .04, p = .037) and negatively predicted Marginalization behavior (β = -.03, p = .044) indirectly, through PA. While small in nature, these effects suggest that men engineers might be more likely than their women colleagues to engage in Integration behavior and less likely to engage in Marginalization behavior at work on account of the greater acceptance they perceive from their coworkers. Being a man, versus a woman, engineer also negatively predicted both Assimilation behavior (β = -.06, p = .001) and Separation behavior (β = -.03, p = .006) through ICA. It therefore appears that men engineers could be less likely than their women colleagues to engage in Assimilation or Separation behavior at work because they place less value on being accepted by their coworkers.

5. Discussion

This study leveraged Berry's (1997, 2005) acculturation framework to examine the influence of gender on men and women engineers' workplace acculturation behaviors. Our goal was to gain deeper insight into the role of workplace acculturation preferences and perceived acceptance from coworkers in mediating these relationships. We used path analysis to fit our proposed model to data from 502 practicing engineers. This research complements qualitative literature on gender in engineering showing that women engineers value being accepted by their coworkers and feel that not enough acceptance is extended to them (Faulkner, 2009a; Hatmaker, 2013; McIlwee & Robinson, 1992; Miller, 2002; Powell, 2009). It also sheds light on the mechanisms that lead women engineers to adopt the strategies they do as they acculturate.

Our findings reveal that both ICA and PA significantly mediated the relationship between gender and workplace acculturation behaviors, underlining the importance of acceptance related factors for women within workplaces. Although ICA and PA are distinct constructs, they both are related to acceptance from coworkers. The importance individuals place on being accepted by their coworkers indicates how much they desire to belong and experience connection at work, while perceivedacceptance from coworkers represents how well they are actually welcomed and received. These findings are supported by research which suggests that the need for acceptance is one of many motivators governing individuals' workplace behavior and interactions (e.g., Deci & Ryan, 2000). Yet, despite their similarities, ICA and PA emerged as drivers of different acculturation behaviors for women and men.

We detected a positive, small, and significant indirect effect of gender via PA on Integration behavior and a negative, small, and significant indirect effect of gender via PA on Marginalization behavior. These results suggest that, compared to women engineers, men engineers engage more in the Integration behavior and less in the Marginalization behavior probably because they perceive greater acceptance from their coworkers. If men engineers experience greater freedom to integrate than women engineers do, this can likely be attributed to their higher standing in the workplace power hierarchy. Conversely, women engineers' greater likelihood of getting marginalized due to lower perceived acceptance points to the restrictions they experience to acting as themselves in male-dominated professions (Hatmaker, 2013; Miller, 2002; Powell, 2009). Such lack of freedom, in turn, may prevent them from acculturating according to their preferences, which is to seek acceptance and belonging at work (Hood & Koberg, 2009). Literature supports that the lack of one-on-one correspondence between acculturation attitudes and behaviors can be explained by power dynamics and lack of acceptance within the mainstream culture(Navas et al., 2005; Sam & Berry, 2005; van de Vijver et al., 2016). Together, these findings suggest that acceptance is paramount to women engineers fully integrating into the workplace and bringing their whole selves to their work (Slepian, 2020).

The results also show a weak but significant mediation effect of ICA on the relationship between gender and Assimilation behavior and gender and Separation behavior. The data appear to show that women engineers engage more in these two behaviors than men engineers, possibly due to the value they place on acceptance from coworkers. This finding is validated by qualitative literature where women implicitly or

explicitly reveal their desire to belong and be accepted by their coworkers. The desire to be accepted could possibly explain why they adopt coping strategies such as behaving like "one of the boys" or tolerating gender discrimination (Faulkner, 2009a; Hatmaker, 2013; Miller, 2002; Powell, 2009), or seeking unity and camaraderie with men and women they feel safe with (Fernando et al., 2018; Khilji & Pumroy, 2019; Schmitt, 2021). Men engineers, on the other hand, do not place as much importance on being accepted by coworkers as women, perhaps because they find themselves in the majority at work and take acceptance for granted. Research shows that a greater need to belong can be an asset, as it has been linked to higher employee engagement and good organizational citizenship behaviors (Ashforth et al., 2008; Rochford, 2013). However, to the extent that belonging requires conformity to masculine culture or gender separation, engineering organizations may not actually benefit from increasing gender diversity within their ranks.

Importantly, one presumed antecedent of workplace acculturation behaviors did not mediate the relationship between gender and these behaviors. While being a man, versus woman, engineer was associated with lower IRV, this effect was not statistically significant. To contextualize this finding, we revisit the scale used to measure IRV, which asked questions such as, "How important is it to you that at work: you are true to yourself?" The finding that men and women engineers rated themselves equally high on this scale, on average, suggests that authenticity to oneself at work is important for both genders. Faulkner (2009b) reinforces this notion from women's perspective, noting that despite their desire to be accepted as themselves, "[w]omen engineers often face an '(in)visibility paradox' whereby they struggle to be seen as either 'real' engineers or

‘real’ women [and] have to do more practitioner and gender identity work [than] men engineers [who] belong more readily on both fronts” (p. 277). We note that IRV still had a positive, significant effect on Integration behavior and a negative, significant effect on Assimilation behavior. Thus, we can posit from the findings that IRV does make engineers more likely to integrate and less likely to assimilate, as aligned with Berry’s (1997, 2005) postulates, but it does this for men and women equally.

In sum, our study findings suggest that, out of desire for and perceived denial of acceptance, women engineers resort to adaptation (coping) strategies (i.e., Assimilation, Separation, and Marginalization) to fit in with the male-dominated status quo in engineering. More specifically, the desire for acceptance appears to make women more likely than men to assimilate into the mainstream work culture or otherwise seek out support networks of like-minded individuals, whereas the perceived denial of acceptance appears to make women more likely to isolate themselves and less likely to integrate into the workplace. Both mechanisms erase or hide from view the unique perspectives that women engineers bring to engineering, which, in turn, allows the masculine nature of engineering to go unquestioned. Powell (2009) elaborates on this notion, stating that necessitating that women engineers change and adapt themselves to fit into mainstream engineering culture “does nothing to challenge the gendered culture of engineering and, in many ways, contributes to maintaining an environment that is hostile to women” (p. 2). Our research accentuates the need to reform engineering culture such that women can both be themselves and be accepted by the mainstream within engineering environments. Recommendations for achieving such goals are explored in the following section.

6. Implications and Future Work

We see several implications of our findings for eliminating the need for coping strategies (i.e., Assimilation, Separation, and Marginalization) and creating more equitable and inclusive work environments for engineering women. First, our results suggest that engineering organizations should work to foster greater acceptance of women engineers, given that perceived lack of coworker acceptance was associated with lower rates of Integration behavior and higher rates of Marginalization behavior. Integration behavior has been linked to positive employee outcomes, including greater job satisfaction (e.g., Lu, Samaratunge, & Härtel, 2012, 2016; Peeters & Oerlemans, 2009; Valenzuela et al., 2020), which, in turn, has been shown to increase the retention of women engineers (e.g., Fouad & Singh, 2012; Singh et al., 2013). On the other hand, studies show that getting Marginalized , may make individuals more likely to leave their organization (Slepian, 2020; Van der Zee & Sandal, 2016). Organizations can create an environment of greater acceptance for women engineers in several ways, including educating employees on the benefits of gender diversity and designing hiring practices to onboard individuals that will contribute to such an environment. Second, we propose that engineering employers work to dismantle embedded attitudes normalizing coping strategies as expected and rewarded behavior. Our findings show that women engineers, more than their men counterparts, prefer Assimilation or Separation behaviors probably due to a desire to be accepted and belong. Employees, particularly men, can be trained and encouraged to be more accepting of women to facilitate their path towards Integration, allowing more women engineers to acculturate according to their preferences. Smith-Doerr et al. (2017) back this idea, stating that women must be fully

integrated in organizational spaces in order for gender diversity to yield benefits. Finally, we believe such training can be extended into engineering education. Teaching graduating engineers about the value of an inclusive work culture can prepare them to become change agents who offset the status quo to make engineering workplaces more inclusive.

Findings from this study are valuable for researchers in further investigating the complex process of workplace acculturation, particularly in a male-dominated field such as engineering. At the same time, opportunities for future work exist. While Berry's (1997, 2005) framework and other research (Ajzen, 2012; Ajzen & Fishbein, 2005) posit that attitudes precede behavior, there is evidence that workplace behavior can also influence attitudes (Ashforth, Harrison, & Corley, 2008; Rochford, 2013). Furthermore, organizational socialization researchers have linked both workplace adjustment behaviors and perceived social acceptance to distal workplace outcomes such as job satisfaction and organizational commitment (Bauer et al., 2007; Malo et al., 2016). It thus stands to reason that women's participation in Integration or coping behaviors, perceived acceptance, and job outcomes could be closely related. We therefore propose that longitudinal and/or qualitative study into the interplay between acculturation attitudes and behaviors could generate powerful insight into women's job satisfaction and organizational commitment. There also exists the possibility of exploring the impact of workplace acculturation preferences and attitudes on workplace behaviors from different demographic perspectives. Although we compared men and women in this study, we acknowledge that their preferences and attitudes may not be monolithic to all men or all women and instead may vary along other important dimensions such as racial and ethnic

identity or immigrant status (Abhyankar & Brunhaver, 2021). Studies further exploring these differences and their impact could inform efforts to make engineering more inclusive for those of other or multiple underserved identities. Lastly, our framework, measures, and analyses provided encouraging results and promising directions for further research and could be adapted with ease to the study of other gender-segregated workplaces.

7. Conclusion

This study represents a critical step in advancing understanding of the current barriers to women's full acceptance and participation in engineering workplaces. Our findings revealed that women placed higher importance on receiving acceptance from their coworkers than men do and simultaneously perceived less acceptance. This combination proves detrimental to women's integration into the workforce and drives them to instead resort to the adaptation behaviors/coping mechanisms of Assimilation, Separation, and Marginalization. These coping mechanisms have become a normal part of women's socialization process into engineering, and the need for women to adopt them contributes to both the perpetuation of engineering's masculine culture and underrepresentation of women. This reality is not commensurate with the diversification goals of engineering organizations. Thus, to reap the rewards of gender diversity, engineering employers must be willing to create an accepting and welcoming work culture in which women need not resort to coping behaviors at all.

CHAPTER 5

CONCLUSION

This three-part study, presented in the preceding chapters, leveraged Berry's (1997, 2005) acculturation framework from cross-cultural psychology to gain insight into the diversity-related behaviors of working engineers and the interplay of factors that influence these behaviors. Acculturation refers to the process by which individuals adjust to people different from themselves in their daily interactions (Berry, 1972, 2005). These differences could be based on gender, ethnicity, physical and mental ability, age, and the resulting attitudes, beliefs, and values that comprise their worldview (McMillan-Capehart, 2004). Berry's framework was initially developed to understand the acculturation behaviors of migrants moving from their heritage culture to a new host culture. It posits that, depending on individuals' acculturation preferences – importance of retaining their own heritage culture (self-maintenance) and importance of being in contact with and making connections with their new host culture (self-adaptation) – individuals will engage in one of four types of acculturation behaviors – Integration (high maintenance and high adaptation), Assimilation (low maintenance and high adaptation), Separation (high maintenance and low adaptation), or Marginalization (low maintenance and low adaptation). In this dissertation, acculturation refers to engineers' adjustment in response to interacting with coworkers who may differ from them on some dimension. Three factors are hypothesized to influence workplace acculturation behaviors –

Importance of Retaining Own Values (IRV), Importance of Coworker Acceptance (ICA), and Perceived Acceptance from Coworkers (PA).

Data for the three studies came from 789 working engineers fifteen years past earning at least engineering degree from a large public university in the southwestern United States. The first study developed and validated an instrument to measure acculturation behaviors and their determinants using exploratory (n = 216) and confirmatory (n = 573) factor analysis. In addition, the study found weak to strong support for each hypothesized relationship in Berry's model.

The second study conducted cluster analysis (n = 502) on participants' acculturation preferences, IRV and ICA, to reveal four attitudinal clusters – Integration , Assimilation, Separation, and Marginalization – and further found differential cluster membership among engineers with different surface and deep level demographic traits. The four traits that revealed differential cluster preferences were gender (men versus women), race/ethnicity (Asian/Asian American and White/European American men displayed different patterns of attitudes relative to all other men), percentage of women in the group, and immigration status (immigrant versus non-immigrant). For example, the study showed that women were more likely to exhibit an Integration attitude and less likely to exhibit a Separation attitude than men, and engineers whose work group lacked women were more likely to prefer a Separation attitude than all other participants.

The third study proposed and validated a path model (n = 502) relating gender and acculturation behaviors mediated by the determinants IRV, ICA, and PA. The results indicated that the three determinants do differentially influence workplace acculturation behaviors for men and women engineers. The findings specifically revealed that 1)

compared to women engineers, men engineers were more likely to engage in Integration behavior and less likely to engage in Marginalization behavior, as mediated by perceived acceptance from their coworkers (PA), and 2) compared to men engineers, women engineers were more likely to engage in Assimilation and Separation behaviors, as mediated by importance of coworker acceptance (ICA). Taken together, the results of the second and third studies suggest that while women engineers appear to place more importance on integrating into the workplace than men, they are less likely to engage in Integration behavior than men for reasons that may be related to acceptance. This finding substantiates a large body of qualitative literature that concludes the same (e.g., Faulkner, 2009a; Hatmaker, 2013; McIlwee & Robinson, 1992; Miller, 2002; Powell, 2009).

In terms of limitations, the data collected come from alumni of a single institution at a single point in time. Longitudinal study with larger and more diverse samples of engineers would help to further validate the instrument and establish the appropriate patterns of causality between acculturation preferences, perceptions, and behaviors. Furthermore, the generic nature of the language used for the instrument – designed to capture individuals' behaviors resulting from interactions with employees different from themselves in terms of both surface-level and deep-level traits – was another limitation. Items on the survey with expressions such as "similar to me" and "different from me" were not explicitly defined and were left to the participant for interpretation, in turn, creating ambiguity in the interpretation of results. For example, the third study found that women engineers engage in Separation behavior more so than do men engineers, as mediated by the ICA. However, the result does not provide any information on the kind of Separation behavior women are more likely to engage in. It is unclear whether they

gravitate toward smaller groups of other women or toward smaller groups of both women and men who think more like they do. Thus, delinking the instrument from specific diversity-related markers to make the instrument more general, in turn, limited its interpretability. Future work could customize the instrument to include specific diversity-related markers such as gender, age, or race-ethnicity (e.g., "I tend to socialize with coworkers of my same gender at work") to provide more specificity around participants' behaviors, preferences, and perceptions. Qualitative studies could also be conducted to better understand how participants interpret these constructs and their items.

Findings gleaned from these studies could additionally inform future research and actions that accentuate the positive impacts of diversity within workplaces. For example, the acculturation behaviors and determinants developed in this dissertation could be included in a larger model with other personal and contextual factors to develop a more comprehensive understanding of the dynamics influencing employees' acculturation behaviors. Interventions could also be designed to encourage specific acculturation attitudes, such as Integration for enhancing creativity or Assimilation for encouraging employee compliance, depending on the goals of the organization. Further, organizations could use the findings of this work to hire individuals who will value retaining their individuality and want to stay connected with their coworkers, leading to an increase in the number of individuals with an Integration attitude. They could also work to instill the value of acceptance in all employees, since Integration attitudes cannot translate into Integration behaviors without coworker acceptance. Lastly, the study results can be used to educate current and future engineers about the nuanced nature of workplace acculturation and the importance of acceptance in creating inclusive work environments.

Encouraging Integration behaviors among engineers may equip them to be the change agents that engineering workplaces need going forward.

REFERENCES

Abhyankar, R., & Brunhaver, S. (2019). *Development of the Value Alignment and Adaptation Strategies (VAAS) Instrument.* Proceedings of the Frontiers in Education Conference, Cincinatti, OH, October 16-19.

Abhyankar, R., & Brunhaver, S. (2022). *Assessing key factors in workplace acculturation dynamics: Development and validation of measures.* Under review.

Agresti, A. (2018). Statistical methods for the social sciences. Pearson.

Aguinis, H., Gottfredson, R. K., & Joo, H. (2013). Best-practice recommendations for defining, identifying, and handling outliers. *Organizational Research Methods, 16*(2), 270-301.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, *50*(2), 179-211.

Ajzen, I. (2012). The theory of planned behavior. In P. A. M. van Lange, A. W. Kruglanski, & E. T. Higgins (Eds.), Handbook of theories of social psychology (pp. 438-459). Sage Publications.

Ajzen, I., & Fishbein, M. (2005). The Influence of Attitudes on Behavior. In D. Albarracín, B. T. Johnson, & M. P. Zanna (Eds.), *The handbook of attitudes* (pp. 173–221). Lawrence Erlbaum Associates Publishers.

Alegria, S. (2019). Escalator or step stool? Gendered labor and token processes in tech work. *Gender & Society, 33*(5), 722-745.

Alkhazraji, K. M., Gardner III, W. L., Martin, J. S., & Paolillo, J. G. (1997). The acculturation of immigrants to U.S. organizations: The case of Muslim employees. *Management Communication Quarterly, 11*(2), 217-265.

Allen, N. J., & Meyer, J. P. (1990). Organizational socialization tactics: A longitudinal analysis of links to newcomers' commitment and role orientation. *Academy of Management Journal, 33*(4), 847-858.

Ammerman, C., & Groysberg, B. (2020, May 5). *Why the crisis is putting companies at risk of losing female talent.* Harvard Business Review. Available at: https://hbr.org/2020/05/why-the-crisis-is-putting-companies-at-risk-of-losing-female-talent.

Ashforth, B. E., Harrison, S. H., & Corley, K. G. (2008). Identification in organizations: An examination of four fundamental questions. *Journal of Management, 34*(3), 325-374.

Barbeau, K., Boileau, K., Sarr, F., & Smith, K. (2019). Path analysis in Mplus: A tutorial using a conceptual model of psychological and behavioral antecedents of bulimic symptoms in young adults. *The Quantitative Methods for Psychology, 15*(1), 38-53.

Bassett-Jones, N. (2005). The paradox of diversity management, creativity and innovation. *Creativity and Innovation Management, 14*(2), 169-175.

Bastalich, W., Franzway, S., Gill, J., Mills, J., & Sharp, R. (2007). Disrupting masculinities: Women engineers and engineering workplace culture. *Australian Feminist Studies, 22*(54), 385-400.

Bauer, T. N., Bodner, T., Erdogan, B., Truxillo, D. M., & Tucker, J. S. (2007). Newcomer adjustment during organizational socialization: a meta-analytic review of antecedents, outcomes, and methods. *Journal of Applied Psychology, 92*(3), 707-721.

Baumeister, R. F., & Leary, M. R. (1995). The need to belong: desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin, 117*(3), 497-529.

Ben-Shalom, U., & Horenczyk, G. (2003). Acculturation orientations: A facet theory perspective on the bidimensional model. *Journal of Cross-Cultural Psychology, 34*(2), 176-188.

Bensimon, E. M. (2016). *The misbegotten URM as a data point.* Center for Urban Education, Rossier School of Education, University of Southern California.

Berry, J. W. (1972). Radical cultural relativism and the concept of intelligence. In L. J. Cronbach & P. Drenth (Eds.), *Mental tests and cultural adaptation* (pp. 77-88). Mouton Publishers.

Berry, J. W. (1997). Immigration, acculturation, and adaptation. *Applied Psychology, 46*(1), 5-34.

Berry, J.W. (2003). Conceptual approaches to acculturation. In K. Chun, P. Balls-Organista, & G. Marin (Eds.), *Acculturation: Advances in theory, measurement and applied research* (pp. 17-37). American Psychological Association.

Berry, J. W. (2005). Acculturation: Living successfully in two cultures. *International Journal of Intercultural Relations, 29*(6), 697-712.s

Berry, J. W. (2015). Acculturation. In J. E. Grusec & P. D. Hastings (Eds.), *Handbook of socialization: Theory and research* (pp. 520-538). The Guilford Press.

Berry, J. W., Kim, U., Power, S., Young, M., & Bujaki, M. (1989). Acculturation attitudes in plural societies. *Applied Psychology, 38*(2), 185-206.

Berry, J. W., Poortinga, Y. H., Segall, M. H., & Dasen, P. R. (2002). *Cross-cultural psychology: Research and applications.* Cambridge University Press.

Bhatti, H. A. (2021). Toward "inclusifying" the underrepresented minority in STEM education research. *Journal of Microbiology & Biology Education, 22*(3), e00202-21. https://doi.org/10.1128/jmbe.00202-21.

Borrego, M. & Henderson, C. (2014). Increasing the use of evidence-based teaching in STEM education: A comparison of eight change strategies. *Journal of Engineering Education, 103*(2), 220-252.

Brewer, M. B. (1991). The social self: On being the same and different at the same time. *Personality and Social Psychology Bulletin, 17*(5), 475-482.

Brown, D.L., Blackmon, S., Rosnick, C.B. Griffin-Fennell, F. D., & White-Johnson, R. L. (2017). Initial development of a gendered-racial socialization scale for African American college women. *Sex Roles, 77*, 178-193.

Brown, T. A. (2015). *Confirmatory factor analysis for applied research* (2nd ed.). Guilford Press.

Buse, K., Bilimoria, D., & Perelli, S. (2013). *Why they stay: Women persisting in US engineering careers.* Career Development International.

Byrne, D. E. (1971). *The attraction paradigm* (vol. 462). Academic Press.

Byrne, D. (1997). An overview (and underview) of research and theory within the attraction paradigm. *Journal of Social and Personal Relationships, 14*(3), 417-431.

Catalyst. (2005). *"2005 Catalyst Member Benchmarking Report."* Available at: https://www.catalyst.org/wp-content/uploads/2019/02/2005MemberBenchmarkingReport.pdf.

Cattell, R. B. (1978). Fixing the number of factors: The most practicable psychometric procedures. In R. B. Cattell (Ed.), *The scientific use of factor analysis in behavioral and life sciences* (pp. 72-91). Springer.

Cech E., Rubineau, B., Silbey, S., & Seron, C. (2011). Professional role confidence and gendered persistence in engineering. *American Sociological Review, 76*(5), 641-666.

Chiu T., Fang, D., Chen, J., Wang, Y., & Jeris, C. (2001). *A robust and scalable clustering algorithm for mixed type attributes in large database environment.* Proceedings of the ACM SIGKDD International Conference on Knowledge Discovery and Data Mining, San Francisco, CA, August 26-29.

Chrobot-Mason, D., & Aramovich, N. P. (2013). The psychological benefits of creating an affirming climate for workplace diversity. *Group & Organization Management, 38*(6), 659-689.

Cletus, H. E., Mahmood, N. A., Umar, A., & Ibrahim, A. D. (2018). Prospects and challenges of workplace diversity in modern day organizations: A critical review. *HOLISTICA-Journal of Business and Public Administration, 9*(2), 35-52.

Coleman, V. I., & Borman, W. C. (2000). Investigating the underlying structure of the citizenship performance domain. *Human Resource Management Review, 10*(1), 25-44.

Cox, T., Jr. (1994). *Cultural diversity in organizations: Theory, research, and practice.* Berrett-Koehler.

Crocker, J., & Park, L. E. (2004). The costly pursuit of self-esteem. *Psychological Bulletin, 130*(3), 392-414.

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika, 16*(3), 297-334.

Davis Tribble, B. L., Allen, S. H., Hart, J. R., Francois, T. S., & Smith-Bynum, M. A. (2019). "No [right] way to be a Black woman": Exploring gendered racial socialization among Black women. *Psychology of Women Quarterly, 43*(3), 381-397.

Deci, E. L., & Ryan, R. M. (2000). The" what" and" why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*(4), 227-268.

Delizonna, L. (2017). *High-performing teams need psychological safety. Here's how to create it.* Harvard Business Review. Available at: https://hbr.org/2017/08/high-performing-teams-need-psychological-safety-heres-how-to-create-it.

Douglas, E. P., Richardson, P. G., & Dupuy, F. (2017). *Work in progress: Racialized experiences of Black engineers.* Proceedings of the American Society for Engineering Education (ASEE) Annual Conference, Columbus, OH, June 25-28.

Dryburgh, H. (1999). Work hard, play hard: Women and professionalization in engineering-adapting to the culture. *Gender & Society, 13*(5), 664-682.

Edmonson, A. (1999). Psychological safety and learning behavior in work teams. *Administrative Science Quarterly, 44*(2), 350-383.

Ely, R. J. (1995). The power in demography: Women's social constructions of gender identity at work. *Academy of Management Journal, 38*(3), 589-634.

Ely, R. J., & Roberts, L. M. (2008). Shifting frames in team-diversity research: From difference to relationships. In A. P. Brief (Ed.), *Diversity at work* (pp. 175-201). Cambridge University Press.

Ely, R. J., & Thomas, D. A. (2001). Cultural diversity at work: The effects of diversity perspectives on work group processes and outcomes. *Administrative Science Quarterly, 46*(2), 229-273.

Everitt, B. (1975). Multivariate analysis: The need for data, and other problems. *British Journal of Psychiatry, 126*(3), 237-240.

Fabrigar, L. R., Wegener, D. T., MacCallum, R. C., & Strahan, E. J. (1999). Evaluating the use of exploratory factor analysis in psychological research. *Psychological Methods, 4*(3), 272.

Faulkner, W. (2007). Nuts and Bolts and People' Gender-Troubled Engineering Identities. *Social Studies of Science, 37*(3), 331-356.

Faulkner, W. (2009a). Doing gender in engineering workplace cultures. I. Observations from the field. *Engineering Studies, 1*(1), 3-18.

Faulkner, W. (2009b). Doing gender in engineering workplace cultures. II. Gender in/authenticity and the in/visibility paradox. *Engineering Studies, 1*(3), 169-189.

Faulkner, W. (2011). Gender (in) authenticity, belonging and identity work in engineering. *Brussels Economic Review, 54*(2/3), 277-293.

Fernando, D., Cohen, L., & Duberley, J. (2018). What helps? Women engineers' accounts of staying on. *Human Resource Management Journal, 28*(3), 479-495.

Fiske, A. P., Kitayama, S., Markus, H. R., & Nisbett, R. E. (1998). The cultural matrix of social psychology. In D. T. Gilbert, S. T. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology* (pp. 915–981). McGraw-Hill.

Flood, M., & Pease, B. (2005). Undoing men's privilege and advancing gender equality in public sector institutions. *Policy and Society, 24*(4), 119-138.

Fouad, N. A., Singh, R., Fitzpatrick, M. E., & Liu, J. P. (2011). *Stemming the tide: Why women leave engineering. Report.* University of Wisconsin-Milwaukee.

Fox, R. S., Merz, E. L., Solórzano, M. T., & Roesch, S. C. (2013). Further examining Berry's model: The applicability of latent profile analysis to acculturation. *Measurement and Evaluation in Counseling and Development, 46*(4), 270-288.

Frehill, L. (2010). Satisfaction. *Mechanical Engineering, 132*(1), 38-41.

Frehill, L. M. (2007). The Society of Women Engineers National Survey about Engineering: Is the engineering workplace 'warming' for women? *SWE Magazine, 53*(5), 16-20.

Frehill, L. M. (2008). Why do women leave the engineering work force?. *SWE Magazine, 54*(1), 24-26.

Fromkin, H. L., & Snyder, C. R. (1980). The search for uniqueness and valuation of scarcity. In K. J. Gergen, M. S. Greenberg, & R. H. Willis (Eds.), *Social exchange* (pp. 57-75). Springer.

Funk, C., & Parker, K. (2018). *Women and men in STEM often at odds over workplace equity.* Pew Research Center. Available at: https://www.pewresearch.org/social-trends/2018/01/09/women-and-men-in-stem-often-at-odds-over-workplace-equity/.

Garson, D. (2008). *Path analysis.* Available at: https://www.scribd.com/document/323656506/Garson-2008-PathAnalysis-pdf.

Ghosh, D., & Vogt, A. (2012). *Outliers: An evaluation of methodologies.* American Statistical Association, Joint Statistical Meetings. Available at: http://www.asasrms.org/Proceedings/y2012/Files/304068_72402.pdf.

Green, K. A., López, M., Wysocki, A., & Kepner, K. (2020). *Diversity in the workplace: Benefits, challenges, and the required managerial tools.* University of Florida, Institute of Food and Agricultural Sciences. Available at: https://edis.ifas.ufl.edu/publication/hr022.

Guillaume, Y. R., Dawson, J. F., Otaye-Ebede, L., Woods, S. A., & West, M. A. (2017). Harnessing demographic differences in organizations: What moderates the effects of workplace diversity?. *Journal of Organizational Behavior, 38(*2), 276-303.

Guillaume, Y. R., Dawson, J. F., Woods, S. A., Sacramento, C. A., & West, M. A. (2013). Getting diversity at work to work: What we know and what we still don't know. *Journal of Occupational and Organizational Psychology, 86*(2), 123-141.

Harrison, D. A., Price, K. H., & Bell, M. P. (1998). Beyond relational demography: Time and the effects of surface-and deep-level diversity on work group cohesion. *Academy of Management Journal, 41*(1), 96-107.

Harrison, D. A., Price, K. H., Gavin, J. A., & Florey, A. T. (2002). Time, teams, and task performance: Changing effects of surface- and deep-level diversity on group functioning. *Academy of Management Journal, 45*(5), 1029-1045.

Hatmaker, D. M. (2013). Engineering identity: Gender and professional identity negotiation among women engineers. *Gender, Work & Organization, 20*(4), 382-396.

Hayden, F. G. (1988). Values, beliefs, and attitudes in a sociotechnical setting. *Journal of Economic Issues, 22*(2), 415-426.

Heale, R., & Twycross, A. (2015). Validity and reliability in quantitative studies. *Evidence-Based Nursing, 18*(3), 66-67.

Hoever, I. J., Van Knippenberg, D., Van Ginkel, W. P., & Barkema, H. G. (2012). Fostering team creativity: perspective taking as key to unlocking diversity's potential. *Journal of Applied Psychology, 97*(5), 982-996.

Hofstede, G. (1983). The cultural relativity of organizational practices and theories. *Journal of International Business Studies, 14*(2), 75-89.

Hofstede, G. (1989). National negotiation styles. In F. Mautner-Markhof (Ed.), *Processes of international negotiation*s (pp. 193-201). Westview Press.

Hofstede, G. (2001). *Culture's consequences: Comparing values, behaviors, institutions and organizations across nations.* Sage Publications.

Hofstede, G., Hofstede, G. J., & Minkov, M. (2010). *Culture and organizations: Software of the mind: Intercultural cooperation and its importance for survival.* McGraw-Hill.

Holodny, E. (2015, September 28). *There will no longer be a racial or ethnic majority in the U.S. by 2055.* Business Insider. Available at: https://www.businessinsider.com/non-hispanic-whites-projected-minority-us-2055-2015-9.

Homan, A. C., Hollenbeck, J. R., Humphrey, S. E., Knippenberg, D. V., Ilgen, D. R., & Van Kleef, G. A. (2008). Facing differences with an open mind: Openness to experience, salience of intragroup differences, and performance of diverse work groups. *Academy of Management Journal, 51*(6), 1204-1222.

Hood, J. N., & Koberg, C. S. (1994). Patterns of differential assimilation and acculturation for women in business organizations. Human Relations, 47(2), 159-181.

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6(1), 1-55.

Huff, J. L., Smith, J. A., Jesiek, B. K., Zoltowski, C. B., & Oakes, W. C. (2019). Identity in engineering adulthood: An interpretative phenomenological analysis of early-career engineers in the United States as they transition to the workplace. *Emerging Adulthood, 7*(6), 451-467.

Humphrey, S. E., Nahrgang, J. D., & Morgeson, F. P. (2007). Integrating motivational, social, and contextual work design features: a meta-analytic summary and theoretical extension of the work design literature. *Journal of Applied Psychology, 92*(5), 1332-1356.

Hurley, A. E., Scandura, T. A., Schriesheim, C. A., Brannick, M. T., Seers, A., Vandenberg, R. J., & Williams, L. J. (1997). Exploratory and confirmatory factor analysis: Guidelines, issues, and alternatives. *Journal of Organizational Behavior, 18*(6), 667-683.

IBM Corp. (2019). *IBM SPSS Statistics for Windows, version 26.0.* IBM Corp.

IBM SPSS Statistics. (2016). *Two-step cluster analysis.* IBM Corp. Available at: https://www.ibm.com/docs/en/spss-statistics/24.0.0?topic=option-twostep-cluster-analysis.

J. B. Bear and A.W. Woolley, "The role of gender in team collaboration and performance," *Interdisciplinary Science Reviews, 36*(2), 146-153, 2011.

Jackson, S. E., May, K. E., & Whitney, K. (1995). Understanding the dynamics of diversity in decision-making teams. In R. A. Guzzo & E. Salas (Eds.), *Team decision-making effectiveness in organizations* (pp. 204-261). Jossey-Bass.

Jansen, A. E., & Searle, B. J. (2021). Diverse effects of team diversity: a review and framework of surface and deep-level diversity. *Personnel Review, 50*(9), 1838-1853.

Jasinskaja-Lahti, I., Liebkind, K., Horenczyk, G., & Schmitz, P. (2003). The interactive nature of acculturation: Perceived discrimination, acculturation attitudes and stress among young ethnic repatriates in Finland, Israel and Germany. *International Journal of Intercultural Relations, 27*(1), 79-97.

Jian, G. (2012). Does culture matter? An examination of the association of immigrants' acculturation with workplace relationship quality. *Management Communication Quarterly, 26*(2), 295-321.

Joslin, F., Waters, L., & Dudgeon, P. (2010). Perceived acceptance and work standards as predictors of work attitudes and behavior and employee psychological distress following an internal business merger. *Journal of Managerial Psychology, 25*(1), 22-43.

Khilji, S. E., & Pumroy, K. H. (2019). We are strong and we are resilient: Career experiences of women engineers. *Gender, Work & Organization, 26*(7), 1032-1052.

Kline, R. B. (1998). Software review: Software programs for structural equation modeling: Amos, EQS, and LISREL. *Journal of Psychoeducational Assessment, 16*(4), 343-364.

Kline, T. (2005). *Psychological testing: A practical approach to design and evaluation.* Sage.

Komisarof, A. (2009). Testing a modified interactive acculturation model in Japan: American-Japanese coworker relations. *International Journal of Intercultural Relations, 33*(5), 399-418.

Leaper, C., & Friedman, C. K. (2007). The Socialization of Gender. In J. E. Grusec & P. D. Hastings (Eds.), *Handbook of socialization: Theory and research* (pp. 561–587). The Guilford Press.

Leary, M. R., Kelly, K. M., Cottrell, C. A., & Schreindorfer, L. S. (2013). Construct validity of the need to belong scale: Mapping the nomological network. *Journal of Personality Assessment, 95*(6), 610-624.

Lebedeva, N., Tatarko, A., & Berry, J. W. (2016). Intercultural relations among migrants from Caucasus and Russians in Moscow. *International Journal of Intercultural Relations, 52*, 27-38.

Lester, J. (2008). Performing gender in the workplace: Gender socialization, power, and identity among women faculty members. *Community College Review, 35*(4), 277-305.

Lu, Y., Samaratunge, R., & Härtel, C. E. (2012). The relationship between acculturation strategy and job satisfaction for professional Chinese immigrants in the Australian workplace. *International Journal of Intercultural Relations, 36*(5), 669-681.

Lu, Y., Samaratunge, R., & Härtel, C. E. (2016). Predictors of acculturation attitudes among professional Chinese immigrants in the Australian workplace. *Journal of Management & Organization, 22*(1), 49-67.

Male, S. A., Gardner, A., Figueroa, E., & Bennett, D. (2018). Investigation of students' experiences of gendered cultures in engineering workplaces. *European Journal of Engineering Education, 43*(3), 360-377.

Malik, A., & Manroop, L. (2017). Recent immigrant newcomers' socialization in the workplace. Equality, Diversity and Inclusion: *An International Journal, 36*(5), 382-400.

Malo, M., Tremblay, I., & Brunet, L. (2016). Cognitive adjustment as an indicator of psychological health at work: Development and validation of a measure. *Journal of Vocational Behavior, 92,* 33-43.

Malone, G. P., Pillow, D. R., & Osman, A. (2012). The general belongingness scale (GBS): Assessing achieved belongingness. *Personality and Individual Differences, 52*(3), 311-316.

Mannix, E., & Neale, M. A. (2005). What differences make a difference? The promise and reality of diverse teams in organizations. *Psychological Science in the Public Interest, 6*(2), 31-55.

Maslow, A. (1968). Some educational implications of the humanistic psychologies. *Harvard Educational Review, 38*(4), 685-696.

McCoach, D. B., Gable, R. K., & Madura, J. P. (2013). *Instrument development in the affective domain.* Springer.

McDonald, N. M., & Messinger, D. S. (2011). The development of empathy: How, when, and why. In J. J.Sanguineti, A. Acerbi, & J. A. Lombo (Eds.), *Moral behavior and free will: A neurobiological and philosophical approach* (pp. 333-359). If Press.

McIlwee, J. S., & Robinson, J. G. (1992). *Women in engineering: Gender, power, and workplace culture.* SUNY Press.

McIntosh, P. (2020). White privilege and male privilege: A personal account of coming to see correspondences through work. In Ed. K. Weekes, *Privilege and prejudice: Twenty years with the invisible knapsack* (pp. 7-18). Cambridge Scholars Publishing.

McMillan, A., & Lopez, T. B. (2001). Socialization and acculturation: Organizational and individual strategies toward achieving P.O. fit in a culturally diverse society. *The Mid-Atlantic Journal of Business, 37*(1), 19-34.

McMillan-Capehart, A. (2005). A configurational framework for diversity: Socialization and culture. *Personnel Review, 34*(4), 488-503.

Miklikowska, M. (2017). Development of anti?immigrant attitudes in adolescence: The role of parents, peers, intergroup friendships, and empathy. *British Journal of Psychology, 108*(3), 626-648.

Miller, G. (2002). The frontier, entrepreneurialism, and engineers: Women coping with a web of masculinities in an organizational culture. *Culture and Organization, 8*(2), 145-160.

Mills, A. J. (1988). Organization, gender and culture. *Organization Studies, 9*(3), 351-369.

Mohammadi, A., Broström, A., & Franzoni, C. (2017). Workforce composition and innovation: how diversity in employees' ethnic and educational backgrounds facilitates firm-level innovativeness. *Journal of Product Innovation Management, 34*(4), 406-426.

Moreland, R. L. (1985). Social categorization and the assimilation of" new" group members. *Journal of Personality and Social Psychology, 48*(5), 1173-1190.

Morris, L. K., & Daniel, L. G. (2008). Perceptions of a chilly climate: Differences in traditional and non-traditional majors for women. *Research in Higher Education, 49*(3), 256-273.

Mowday, R. T., Steers, R. M., & Porter, L. W. (1979). The measurement of organizational commitment. *Journal of Vocational Behavior, 14*(2), 224-247.

Murphy, K., Strand, L., Theron, L., & Ungar, M. (2021). "I just gotta have tough skin": Women's experiences working in the oil and gas industry in Canada?. *The Extractive Industries and Society, 8*(2), 100882.

Muthen, L. K., & Muthen, B. O. (1998). *Mplus [computer software]*. Muthén & Muthén.

Nair, N., & Vohra, N. (2015). *Diversity and inclusion at the workplace: A review of research and perspectives. Working paper.* Indian Institute of Management Ahmedabad. Available at: https://web.iima.ac.in/assets/snippets/workingpaperpdf/8631467072015-03-34.pdf.

National Science Foundation, (2017). *Women, minorities, and persons with disabilities in science and engineering. Data tables.* Available at: https://www.nsf.gov/statistics/2017/nsf17310/data.cfm.

National Science Foundation, National Center for Science and Engineering Statistics. (2021). *Women, minorities, and persons with disabilities in science and engineering. Data tables.* Available at: https://ncses.nsf.gov/pubs/nsf21321/data-tables.

Navas, M., García, M. C., Sánchez, J., Rojas, A. J., Pumares, P., & Fernández, J. S. (2005). Relative Acculturation Extended Model (RAEM): New contributions with regard to the study of acculturation. *International Journal of Intercultural Relations, 29*(1), 21-37.

Nesdale, D., Rooney, R., & Smith, L. (1997). Migrant ethnic identity and psychological distress. *Journal of Cross-Cultural Psychology*, *28*(5), 569-588.

Neto, F., Barros, J., & Schmitz, P. G. (2005). Acculturation attitudes and adaptation among Portuguese immigrants in Germany: Integration or separation. *Psychology and Developing Societies, 17*(1), 19-32.

Nunnally, J. C. (1978). *Psychometric theory* (2nd ed). McGraw-Hill.

Oerlemans, W. G. M., & Peeters, M. C. W. (2010).The multicultural workplace: Interactive acculturation and intergroup relations. *Journal of Managerial Psychology, 25*(5), 460-478.

Page, S. E. (2007). Making the difference: Applying a logic of diversity. *Academy of Management Perspectives, 21*(4), 6-20.

Patrick, H. A., & Kumar, V. R. (2012). Managing workplace diversity: Issues and challenges. *Sage Open, 2*(2), 1-15.

Paulhus, D. L., & Vazire, S. (2007). The self-report method. In R. W. Robins, R. C. Fraley, & R. F. Krueger (Eds.), *Handbook of research methods in personality psychology* (pp. 224-239). Guilford Press.

Peeters, M. C., & Oerlemans, W. G. (2009). The relationship between acculturation orientations and work-related well-being: Differences between ethnic minority and majority employees. *International Journal of Stress Management, 16*(1), 1-24.

Perkins, R.A. (2011). *Using research-based practices to increase response rates of web-based surveys.* EDUCAUSE Review. Available at: https://er.educause.edu/articles/2011/6/using-researchbased-practices-to-increase-response-rates-of-webbased-surveys.

Phillips, K. W., & Loyd, D. L. (2006). When surface and deep-level diversity collide: The effects on dissenting group members. *Organizational Behavior and Human Decision Processes, 99*(2), 143-160.

Phillips, K. W., & Thomas-Hunt, M. C. (2007). Garnering the benefits of conflict: The role of diversity and status distance in groups. In L. Thompson & K. J. Behfar (Eds.), *Conflict in organizational teams: New directions in theory and practice* (pp. 37-56). Northwestern University Press.

Pickett, C. L., & Leonardelli, G. J. (2006). Using collective identities for assimilation and differentiation. In T. Postmes & J. Jetten (Eds.), *Individuality and the group: Advances in social identity* (pp. 56-73). Sage Publications.

Polach, J. L. (2004). Understanding the experience of college graduates during their first year of employment. *Human Resource Development Quarterly, 15*(1), 5-23

Powell, A., Bagilhole, B., & Dainty, A. (2009). How women engineers do and undo gender: Consequences for gender equality. *Gender, Work & Organization, 16*(4), 411-428.

Pravamayee, S. (2014). Strategy to develop an effective workplace environment. *International Journal of Language & Linguistics, 1*(1), 1-5.

Redish, E. F. (2010). Introducing students to the culture of physics: Explicating elements of the hidden curriculum. *AIP Conference Proceedings, 1289*, 49-52.

Rincon, R. M., & Yates, N. (2018). *Women of color in the engineering workplace. Report.* Society of Women Engineers, and National Society of Black Engineers. Available at: https://swe.org/wp-content/uploads/2018/04/Women-of-Color-Research-2018.pdf.

Rink, F., & Ellemers, N. (2010). Benefiting from deep-level diversity: How congruence between knowledge and decision rules improves team decision making and team perceptions. *Group Processes and Intergroup Relations, 13*(3), 345-359.

Riordan, C. M. (2000). Relational demography within groups: Past developments, contradictions, and new directions. *Research in Personnel and Human Resources Management, 19*, 131-173.

Roberson, Q., Ryan, A. M., & Ragins, B. R. (2017). The evolution and future of diversity at work. *Journal of Applied Psychology, 102*(3), 483-499.

Roberts, L.E., Creary, S.J. (2013). Navigating the self in diverse work contexts. In J.T. Jost, A. C. Kay, & H. Thorisdottir (Eds.), *The Oxford handbook of diversity and work* (pp. 73-97). Oxford University Press.

Rochford, K. (2013). A need to belong as a driver of newcomer organizational citizenship behavior. *Academy of Management Proceedings, 2013*(1), 10585-10585.

Romanenko, A. (2012). *Cultural diversity management in organizations: The role of psychological variables in diversity initiatives.* Diplomica Verlag Gmbh.

Rousseeuw, P. J. (1987). Silhouettes: a graphical aid to the interpretation and validation of cluster analysis. *Journal of Computational and Applied Mathematics, 20*, 53-65.

Saleh, A., & Bista, K. (2017). Examining factors impacting online survey response rates in educational research: Perceptions of graduate students. *Online Submission, 13*(2), 63-74.

Sam, D. L. (2006). Acculturation: Conceptual background and core components. In D. L. Sam, & J. W. Berry, (Eds.), *The Cambridge handbook of acculturation psychology* (pp. 11-26). Cambridge University Press.

Sam, D. L., & Berry, J. W. (2010). Acculturation: When individuals and groups of different cultural backgrounds meet. *Perspectives on Psychological Science, 5*(4), 472-481.

Samnani, A. K., Boekhorst, J. A., & Harrison, J. A. (2012). Acculturation strategy and individual outcomes: Cultural diversity implications for human resource management. *Human Resource Management Review, 22*(4), 323-335.

Samnani, A. K., Boekhorst, J. A., & Harrison, J. A. (2013). The acculturation process: Antecedents, strategies, and outcomes. *Journal of Occupational and Organizational Psychology, 86*(2), 166-183.

Schmitt, M. (2021). Women engineers on their way to leadership: the role of social support within engineering work cultures. *Engineering Studies, 13*(1), 30-52.

Schwartz, S. H. (2006). A theory of cultural value orientations: Explication and applications," *Comparative Sociology, 5*(2), 137-182.

Seron, C., Silbey, S. S., Cech, E., & Rubineau, B. (2016). Persistence is cultural: Professional socialization and the reproduction of sex segregation. *Work and Occupations, 43*(2), 178-214.

Singelis, T. M., Triandis, H. C., Bhawuk, D. P., & Gelfand, M. J. (1995). Horizontal and vertical dimensions of individualism and collectivism: A theoretical and measurement refinement. *Cross-Cultural Research, 29*(3), 240-275.

Sirin, C. V., Villalobos, J. D., & Valentino, N. A. (2016). Group Empathy Theory: The effect of group empathy on US intergroup attitudes and behavior in the context of immigration threats. *The Journal of Politics, 78*(3), 893-908.

Slaton, A. E. (2015). Meritocracy, technocracy, democracy: Understandings of racial and gender equity in American engineering education. In S. H. Christensen, C. Didier, A. Jamison, M. Meganck, C. Mitcham, & B. Newberry (Eds.), *International perspectives on engineering education* (pp. 171-189). Springer.

Slepian, M. (2020). *Are your D&I efforts helping employees feel like they belong?*. Harvard Business Review. Available at: https://hbr.org/2020/08/are-your-di-efforts-helping-employees-feel-like-they-belong.

Sluss, D. M., & Ashforth, B. E. (2007). Relational identity and identification: Defining ourselves through work relationships. *Academy of Management Review, 32*(1), 9-32.

Smith-Doerr, L., Alegria, S. N., & Sacco, T. (2017). How diversity matters in the US science and engineering workforce: A critical review considering integration in teams, fields, and organizational contexts. *Engaging Science, Technology, and Society, 3*, 139-153.

Society of Women Engineers. (2016a.). *Why women leave engineering: The SWE gender culture study.* Available at: http://alltogether.swe.org/2016/04/women-leave-engineering-swe-gender-culture-study.

Society of Women Engineers. (2016b). *What drives female attrition in STEM professions: Highlights from the Society of Women Engineers' National Gender Culture Study.* Available at: https://swe.org/wp-content/uploads/2018/04/16-SWE-029-Culture-Study-10_27_16-Final-CP.pdf.

Society of Women Engineers. (2018). *SWE Research Update: Women in Engineering by the Numbers.* Available at: https://alltogether.swe.org/2018/09/swe-research-update-women-in-engineering-by-the-numbers/.

Stryker, S., & Burke, P. J. (2000). The past, present, and future of an identity theory. *Social Psychology Quarterly, 63*(4), 284-297.

Suharnomo, A. Y., Wahyudi, S., & Wikaningrum, T. (2017). A systematic literature review of managing workplace diversity for sustaining organizational competitive advantage. *International Journal of Mechanical Engineering and Technology, 8*(12), 398-406.

Tajfel, H., & Turner, J. C. (1986). The social identity theory of intergroup behavior. In S. Worchel, & W. G. Austin (Eds.), *Psychology of intergroup relations* (pp. 7–24). Nelson-Hall.

Tamunomiebi, M. D., & John-Eke, E. C. (2020). Workplace diversity: Emerging issues in contemporary reviews. *International Journal of Academic Research in Business and Social Sciences, 10*(2), 255-265.

Tanaka, J. S. (1987). "How big is big enough?": Sample size and goodness of fit in structural equation models with latent variables. *Child Development, 58*(1), 134-146.

Tonso, K. L. (2002). 'Plotting something dastardly': Hiding a gender curriculum in engineering. In E. Margolis (Ed.), *The hidden curriculum in higher education* (pp. 165-184). Routledge.

Torchia, M., Calabrò, A., & Morner, M. (2015). Board of directors' diversity, creativity, and cognitive conflict: The role of board members' interaction. *International Studies of Management and Organization, 45*(1), 6-24.

Triandis, H. C. (1995). *Individualism and collectivism.* Westview Press.

Turner, J. C., & Onorato, R. S. (1999). Social identity, personality, and the self-concept: A self-categorization perspective. In T. R. Tyler, R. M. Kramer, & O. P. John (Eds.), *The psychology of the social self* (pp. 11-46). Psychology Press.

Valenzuela, M. A., Flinchbaugh, C., & Rogers, S. E. (2020). Can organizations help adjust?: The effect of perceived organizational climate on immigrants' acculturation and consequent effect on perceived fit. *Journal of International Management, 26*(3), 100775.

van de Vijver, F., Berry, J. W., & Celenk, O. (2016). Assessment of acculturation. In D. L. Sam, & J. W. Berry, (Eds.), *The Cambridge handbook of acculturation psychology* (pp. 293-314). Cambridge University Press.

Van den Bosch, R., & Taris, T. W. (2014). Authenticity at work: Development and validation of an individual authenticity measure at work. *Journal of Happiness Studies, 15*(1), 1-18.

Van der Zee K. & Sandal G. M. (2016). Cultural diversity in the workplace. In D. L. Sam & J. W. Berry (Eds.), *The Cambridge handbook of acculturation psychology* (pp. 483-503). Cambridge University Press.

Van Knippenberg, D., De Dreu, C. K., & Homan, A. C. (2004). Work group diversity and group performance: an integrative model and research agenda. *Journal of Applied Psychology, 89*(6), 1008-1022.

Van Oudenhoven-van der Zee, K., Paulus, P., Vos, M., & Parthasarathy, N. (2009). The impact of group composition and attitudes towards diversity on anticipated outcomes of diversity in groups. *Group Processes & Intergroup Relations, 12*(2), 257-280.

Vignoles, V. L., Chryssochoou, X., & Breakwell, G. M. (2000). The distinctiveness principle: Identity, meaning, and the bounds of cultural relativity. *Personality and Social Psychology Review, 4*(4), 337-354.

Wang, J., Cheng, G. H. L., Chen, T., & Leung, K. (2019). Team creativity/innovation in culturally diverse teams: A meta-analysis. *Journal of Organizational Behavior, 40*(6), 693-708.

Watts, J.H. (2009) 'Allowed into a man's world' meanings of work-life balance: Perspectives of Women Civil Engineers as 'minority' workers in construction. *Gender, Work & Organization, 16*(1), 37-57.

Weiss, H. M., & Cropanzano, R. (1996). Affective events theory. *Research in Organizational Behavior, 18*(1), 1-74.

Weisz, E., & Zaki, J. (2017). Empathy building interventions: A review of existing work and suggestions for future directions. In Eds. E. M. Seppälä, E. Simon-Thomas, S. L. Brown, M. C. Worline, C. D. Cameron, & J. R. Doty, *The Oxford handbook of compassion science* (pp. 205-217). Oxford Handbooks.

Weston, R., & Gore Jr, P. A. (2006). A brief guide to structural equation modeling. *The Counseling Psychologist, 34*(5), 719-751.

Woolley, A. W., Chabris, C. F., Pentland, A., Hashmi, N., & Malone, T. W. (2010). Evidence for a collective intelligence factor in the performance of human groups. *Science, 330*(6004), 686-88.

Wynn, A. T., & Correll, S. J. (2017). Gendered perceptions of cultural and skill alignment in technology companies. *Social Sciences, 6*(2), 45.

Yu, W., & Wang, S. (2011). An Investigation into the acculturation strategies Of Chinese students in Germany. *Intercultural Communication Studies, 20*(2), 190-210.

Zhang, T., Ramakrishnan, R., & Livny, M. (1996). BIRCH: an efficient data clustering method for very large databases. *ACM Sigmod Record, 25*(2), 103-114.

APPENDIX A

RESULTS OF CONFIRMATORY FACTOR ANALYSIS (CFA) ON THE WORKPLACE ACCULTURATION INSTRUMENT

Results of Confirmatory Factor Analysis (CFA) on the Workplace Acculturation Instrument

Scale item	Standardized factor loading	M	SD	Cronbach's alpha
Workplace Acculturation Preferences				
Importance of Retaining Own Values (IRV)				.88
…you act according to your own values.	.84	4.20	.83	
…you follow your own principles.	.83	4.13	.85	
…you adhere to your own standards of behavior.	.78	4.15	.86	
…you uphold your beliefs.	.75	4.12	.91	
…you are true to yourself.	.65	4.28	.80	
Importance of Coworker Acceptance (ICA)				.89
…you are accepted by your colleagues.	.83	3.85	.99	
…you are welcomed.	.82	3.98	.95	
…you have supportive coworkers.	.79	4.02	.90	
…you fit in with others.	.74	3.46	1.00	
…you are valued by your team.	.72	4.24	.81	
Perceived Acceptance from Coworkers (PA)				.90
I feel accepted by my coworkers.	.88	4.07	.72	
My colleagues seem to like me the way I am.	.83	3.97	.74	
My coworkers are welcoming of me.	.82	4.13	.74	
I feel included among my work-group members.	.76	4.10	.81	
My coworkers take my ideas and opinions seriously.	.72	4.09	.81	
Workplace Interactional Behaviors				
Integration Behavior				.76
I socialize easily with both people similar and different from me.	.67	4.07	.66	
I interact with colleagues from a variety of backgrounds.	.64	4.15	.64	
I get along with my colleagues irrespective of differences in our personal beliefs.	.64	4.12	.72	
I work comfortably with people both similar to and different from me.	.61	3.85	.88	
I have good working relationships with colleagues whose values differ from mine.	.61	4.28	.69	
Assimilation Behavior				.76
I prioritize acting like the majority to belong.	.79	2.35	.98	

I prioritize following mainstream culture.	.64	2.52	1.03	
I prioritize fitting into the larger group.	.62	2.89	.97	
I prioritize blending in versus standing out.	.60	2.92	1.00	
Separation Behavior				.83
I try to work only with people who are like me.	.74	2.09	.95	
I try not to work with people who are different from me.	.74	1.99	.96	
I chat only with coworkers who I relate to.	.69	2.49	1.04	
I socialize only with people who share my values.	.68	2.42	1.05	
I make friends only with people similar to me.	.68	2.45	1.05	
Marginalization Behavior				.83
I do not interact with any coworkers unless I have to.	.75	2.20	1.04	
I avoid making small talk with coworkers.	.73	2.42	1.05	
I keep to myself at work.	.71	2.76	1.12	
I do not make an effort to make friends.	.71	2.42	1.07	

APPENDIX B

DEMOGRAPHIC SURVEY

Demographic Data Collection

Q1.3 **Are you 18 years of age or older and provide your consent?**

- ○ Yes (1)
- ○ No (2)

Q1.4 **Are you currently working in an engineering field?**

- ○ Yes (1)
- ○ No (2)

Q2.1
Section 1: Degree and Employment Information

Q2.2 What year did you graduate with an undergraduate degree?

▼Prior to 1975 (1) ... 2019 (45)

Q2.3 **In what field was your undergraduate degree?**

▼Aerospace, aeronautical, and astronautical engineering (1) ... Other area of study (24)

Q2.4 Please specify the engineering field of your undergraduate degree:

Q2.5 Please specify the "other" field of your undergraduate degree:

_____

Q2.6 Have you earned a graduate or professional degree?

- ○ Yes (1)
- ○ No (2)

Q2.7 What year did you earn your highest degree?

▼Prior to 1975 (1) ... 2019 (45)

Q2.8 What type was your highest degree?

- ○ Master's (1)
- ○ PhD (2)
- ○ Professional (3)
- ○ Other, please specify: (4)

_____

Q2.9 **In what field was your highest degree?**

▼Aerospace, aeronautical, and astronautical engineering (1) ... Other area of study (24)

Q2.10 Please specify the engineering field of your highest degree:

_____

Q2.11 Please specify the "other" field of your highest degree:

_____

Q2.12 **In what field of engineering do you currently work?**

▼Aerospace, aeronautical, and astronautical engineering (1) ... Other engineering field (23)

Q2.13 Please specify the "other" engineering field in which you work:

_____

Q2.14 **For how many years have you worked in an engineering field?**

- ○ Less than 1 (1)
- ○ 1-3 (2)
- ○ 4-6 (3)
- ○ 7-10 (4)
- ○ More than 10 (5)

Q2.15 **For how many years have you worked as an engineer in your current organization?**

- ○ Less than 1 (1)
- ○ 1-3 (2)
- ○ 4-6 (3)
- ○ 7-10 (4)
- ○ More than 10 (5)

Q2.16
In what kind of position are you currently working?

- ○ Individual contributor (1)
- ○ Project lead (2)
- ○ Manager (3)
- ○ Other, please specify: (4) _____

Q2.17 **Approximately how many people are in your primary work group?**

- 0 (1)
- 1 - 3 (2)
- 4 - 6 (3)
- 7 - 10 (4)
- More than 10 (5)

Q2.18
What is the approximate percentage of women in your primary work group?

- 0% (1)
- 1 - 10% (2)
- 11 - 25% (3)
- 26 - 50% (4)
- More than 50% (5)

Q4.1
Section 3: Background Characteristics

Q4.2 **In what country are you located?**

- ○ United States (1)
- ○ Other, please specify: (2) _____
- ○ Prefer not to answer (4)

Q4.3 **What is your gender identity?**

- ○ Male (1)
- ○ Female (2)
- ○ Transgender or gender non-conforming (5)
- ○ Prefer to self-describe, please specify: (3) _____
- ○ Prefer not to answer (4)

Q4.8 **What is your sexual identity?**

- ○ Heterosexual or straight (1)
- ○ Gay or lesbian (2)
- ○ Bisexual (3)
- ○ Prefer to self-describe, please specify: (5) _____
- ○ Prefer not to answer (4)

Q4.4 **To what age group do you belong?**

- ○ 18 - 25 (1)
- ○ 26 - 30 (2)
- ○ 31 - 35 (3)
- ○ 36 - 40 (4)
- ○ 41 or older (5)
- ○ Prefer not to answer (6)

Q4.5 **What is your racial or ethnic identification? Please select <u>all</u> that apply.**

- ☐ American Indian or Alaska Native (1)
- ☐ Asian (2)
- ☐ Black or African American (3)
- ☐ Hispanic or Latino/a (4)
- ☐ Native Hawaiian or Other Pacific Islander (5)
- ☐ White (6)
- ☐ Other, please specify: (7) _____
- ☐ Prefer not to answer (8)

Q4.6 **What option best describes you and your family?**

- ○ One or both of my parent(s)/guardian(s) is a first-generation immigrant (1)
- ○ I am a first-generation immigrant (2)
- ○ Neither of these apply to me (3)
- ○ Prefer not to answer (4)

Q4.7 **What is your relationship status?**

- ○ Single (1)
- ○ Married or in a committed relationship (2)
- ○ Prefer not to answer (3)

Q4.9 **How many dependent children do you have?**

- ○ 0 (0)
- ○ 1 (1)
- ○ 2+ (2)
- ○ Prefer not to answer (3)

Q4.10 **Do you have any additional thoughts or comments on the subject of your workplace values or experiences that you would like to share? Please use the space below.**

_____

_____

_____

_____

_____

Q5.1 Thank You

APPENDIX C

PARTISIPANT'S PERSONAL AND JOB CHARACTERISTICS FROM STUDY II

Table 2.1 Participant's Personal and Job Characteristics from Study II

Characteristic	Percent	Characteristic	Percent
Gender identity		**Relationship status**	
Men	69.3	Married or in a relationship	66.9
Women	28.7	Single	30.3
All others*	2.0	All others	2.8
Racial/ethnic identity		**Dependent status**	
American Indian/Native Alaskan	1.0	Has dependents	30.1
Asian/Asian American	29.5	Does not have dependents	67.7
Black/African American	1.2	All others	2.2
Hispanic/Latin American	7.2	**Type of current position**	
Native Hawaiian/Pacific Islander	0.2	Individual contribution	56.4
White/European American	49.6	Project lead	18.7
Multiple or other races/ethnicities	7.2	Manager	12.5
All others	4.2	Other type of position	12.0
Racial/ethnic identity (recoded)		All others	0.4
Asian/Asian American	29.5	**Field of current position**	
American Indian/Native American, Black/African American, Hispanic/Latin American, and Native Hawaiian/Pacific Islander	14.5	Aerospace/Aeronautical engineering	8.2
White/European American	49.6	Bioengineering/Biomedical engineering	8.0
All others	6.4	Civil engineering	8.4
Immigrant status		Computer engineering/science	14.7
First-generation immigrant	26.3	Electrical/Electronics engineering	18.3
Not a first or second-generation immigrant	68.9	Industrial/manufacturing engineering	7.2
All others	4.8	Mechanical engineering	12.0
Age		Other engineering field	23.3
18 – 25	16.7	**Years worked in current position**	
26 – 30	34.7	Less than 1 year	19.3
31 – 35	22.7	1 – 3 years	43.6
36 – 40	15.3	4 – 6 years	18.9
41 or older	9.6	7 – 10 years	9.4
All others	1.0	More than 10 years	8.8
Type of highest degree		**Years worked in engineering**	
Bachelor's degree	37.8	Less than 1 year	4.8
Master's degree	49.6	1 – 3 years	31.9
Doctoral degree	12.0	4 – 6 years	23.7
Other professional degree	0.6	7 – 10 years	18.1
Field of highest degree		More than 10 years	21.5
Aerospace/Aeronautical engineering	4.8	**Size of workgroup**	
Bioengineering/Biomedical engineering	8.4	1 – 3 people	12.2
Civil engineering	8.0	4 – 6 people	32.9
Computer engineering/science	14.5	7 – 10 people	26.9
Electrical/Electronics engineering	21.3	More than 10 people	27.7
Industrial/manufacturing	5.6	All others	0.4

engineering			
Mechanical engineering	17.5	**Percentage of women in workgroup**	
Other engineering field	15.3	0%	13.5
Other areas of study	3.6	1 – 10%	32.3
All others	1.0	11 – 25%	27.5
Years since earning highest degree		26 – 50%	21.1
Less than 1 year	21.5	More than 50%	5.6
1 – 3 years	33.9		
4 – 6 years	18.5		
7 – 10 years	14.7		
More than 10 years	10.2		
All others	1.2		

*All others: missing or "preferred not to answer"

APPENDIX D

IRB DOCUMENTS

IRB APPROVAL LETTER

ASU Knowledge Enterprise Development

APPROVAL: MODIFICATION

Samantha Brunhaver
Polytechnic Engineering Programs (EGR)
480/727-1883
Samantha.Brunhaver@asu.edu

Dear Samantha Brunhaver:

On 1/2/2019 the ASU IRB reviewed the following protocol:

Type of Review:	Initial Study
Title:	Examining Perceived Engineering Culture, Adaptation Strategies, and Their Influence on Job Satisfaction and Persistence of Engineers.
Investigator:	Samantha Brunhaver
IRB ID:	STUDY00009231
Funding:	None
Grant Title:	None
Grant ID:	None
Documents Reviewed:	• Recruitment_Email.pdf, Category: Recruitment Materials; • Consent Form for participants.pdf, Category: Consent Form; • HRP-503a-Dissertation IRB 12_22_18.docx, Category: IRB Protocol; • Survey Instrument.pdf, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions);

The IRB approved the modification.

When consent is appropriate, you must use final, watermarked versions available under the "Documents" tab in ERA-IRB.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

RECRUITMENT EMAIL

Subject: Invitation to participate in an engineering workplace dissertation survey.
Study Title: Examining the Work Values, Preferences, Behaviors, and Attitudes of Early Career Engineers

Dear [First Name],

I am a third year PhD student in Arizona State University's Engineering Education Systems and Design program. As an ASU engineering alum graduating within the last 10 years, you are invited to participate in a 10-15 minute survey designed to understand the work values, preferences, behaviors, and attitudes of early career engineers.

This survey has been approved by the ASU Institutional Review Board (protocol #9231). The results of this survey will comprise my PhD dissertation research and will be published, in aggregate, in conference papers, presentations, and journal articles. All participant identities will be kept confidential. I am confident that the results of the study will lead to interventions facilitating productive and fulfilling work lives for all engineers.

Please visit the link below to complete the survey by [Date]. At the end of the survey, you will be invited to enter a random drawing for ten $50 Amazon gift cards.

Survey URL:

https://xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

For further information regarding this study, please send an email to my, Rohini.Abhyankar@asu.edu, or to my advisor, Dr. Samantha Brunhaver, Samantha.Brunhaver@asu.edu.

I appreciate your time and contribution to this research!

Sincerely,

Rohini Abhyankar,
Ph.D. Student
Engineering Education Systems & Design
The Polytechnic School
Arizona State University

CONSENT FORM

Arizona State University

Informed Consent for Participants

Title of Project: Examining the Perceptions and Experiences of Early Career Engineers

Investigators:
Rohini Abhyankar, Primary Researcher & PhD Student, Rohini.Abhyankar@asu.edu
Dr. Samantha Brunhaver, Assistant Professor, Samantha.Brunhaver@asu.edu

I. Purpose of this Research Project
I would like to invite you to participate in the above-named research study conducted as part of my dissertation requirement in ASU's Engineering Education Systems and Design PhD program.

II. Procedures
The main activity of this study is an online survey that is expected to take about 10-15 minutes to complete. To participate in the study, the participant must be an engineer at least 18 years of age and holding an engineering job. The participants will be asked to answer questions designed to understand their work values, preferences, behaviors, and attitudes. The online survey link will be active for a two week window in spring of 2019. Respondents will be invited to enter a random drawing for forty $50 Amazon gift cards with an estimated 1/25 chance of winning at the end of the survey. Those who wish to enter will be redirected to a separate form (detached from their survey responses) where they can provide their name and email address. The winning participants will receive the Amazon gift card via email within six to eight week from the survey closing date. The study may share the contact information (not individual responses) of participants who enter the random drawing with the ASU alumni association which provided the study with its initial list of participant email addresses.

III. Risks
I do not anticipate any risks to individuals participating in this research.

IV. Benefits
We hope the results of this exploratory study will help engineering education researchers, employers and educational institutions design interventions to improve engineers' experience in the workplace leading to happier and more productive work lives. In addition, the survey questions may enable participants to be more aware of their own work values, preferences, behaviors, and attitudes in response.

V. Extent of Anonymity and Confidentiality
This survey is anonymous and no identifying information (including the IP address of the respondent) is being collected. The IP address collection feature on the Qualtrics survey has been disabled. Participants can choose whether to provide their name and email address in a separate form to be entered into a random gift card drawing.

VII. Freedom to Withdraw
It is important for you to know that you are free to withdraw from this study, or not respond to questions to which you do not want to respond, without penalty.
VIII. Questions or Concerns
Should you have any questions about this study, you may contact the research investigator/professor(s) whose contact information is provided below:

Rohini Abhyankar
Primary Researcher & PhD Student
Arizona State University
Rohini.Abhyankar@asu.edu

Dr. Samantha Brunhaver
Assistant Professor
Arizona State University
Samantha.Brunhaver@asu.edu

This study has been reviewed and approved by the Arizona State University Institutional Review Board. If you have any questions about your rights as a subject/participant in this research, or if you feel you have been placed at risk, you can contact the Institutional Review Board, through the ASU Office of Research Integrity and Assurance, at (480) 965-6788.

IX. Subject's Consent
I have read the Consent Form and conditions of this project. I have had all my questions answered. I hereby acknowledge and give my voluntary consent.

Note: The survey participants will be required to check the box associated with the above item to give their consent and to proceed with the survey.