International Journal of Engineering Education Vol. 36, No. 3, pp. 955–973, 2020
Printed in Great Britain

0949-149X/91 $3.00+0.00

A Snapshot of the Socialization Process: Socialization Tactics, Behaviors, and Outcomes in the U.S. Aerospace and Defense Industry*

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Research suggests that engineers generally undergo socialization through two sets of socialization processes when they are newly hired to an organization: (1) initiating proactive behaviors and (2) participating in company-initiated actions, called organizational tactics. This study provides a first-look at socialization in the U.S. aerospace and defense (A&D) industry by examining how newly-hired engineers at A&D organizations initiate proactive behaviors and participate in organizational tactics to adjust to their new jobs and organizations. First, the relationships between two sets of socialization processes and socialization outcomes of new engineers were examined. Second, holistic profiles that best characterize newly hired engineers' socialization processes, and whether engineers with different types of profiles present varying socialization outcomes were identified. A total of 86 new engineers who had less than two years of working experience in their A&D organizations were included in this study. Multiple regression and Latent Profile Analyses (LPA) were employed. Study findings show that newly-hired engineers in the A&D industry frequently rely on social interactions to adjust to their job position and organization, and they often participate in organizational tactics more than proactive socialization behaviors. Implications of these findings in the context of A&D workplaces and aerospace engineering education settings are discussed.

Keywords: socialization processes; socialization outcomes; aerospace and defense organizations; aerospace engineering education

1. Introduction

When newly-hired engineers with little or no professional working experience enter the workplace for the first time after graduating from college, they often encounter uncertainty about the organization and their new job position [1, 21]. Uncertainty can be frustrating for new engineers because it creates difficulty for them when trying to understand the organization's culture, job expectations, and their job responsibilities [22]. To overcome these uncertainties, new engineers and their organizations often use socialization processes during the transition period from college to the workplace. The term "socialization processes" refers to the use of various mechanisms and actions to help newcomers manage the uncertainty and facilitate the transition from an inexperienced, new engineer to becoming a contributing, organizational insider [1–3]. In other words, newcomers adjust to their new job positions by going through socialization processes. A newcomer is said to have successfully adjusted when he or she has achieved socialization outcomes of role clarity, task mastery, workgroup integration, and newcomer learning [1, 4–10].

Many research studies suggest that socialization processes have a significant relationship with newcomers' socialization outcomes [11–14]. In the past, socialization processes in the engineering context have been studied through various lenses such as organizational tactics, proactive behaviors, supports and barriers, social exchange processes, and social capital [8, 10, 14–18]. Despite the exhaustive and progressive nature of this research area, several disciplines have been omitted from the socialization literature. Only a fraction of socialization research has studied engineers, and an even smaller percentage of studies has examined the socialization of engineers in the aerospace and defense (A&D) industry jointly with other engineering industries [16, 19]. To our knowledge, no study has examined the socialization of new engineers in the exclusive context of A&D organizations. This study defines A&D organizations as those that research, develop, design, manufacture, maintain, or operate components on aircraft or spacecraft. It is important to examine the socialization of engineers in the A&D industry due to their impact on the U.S. economy, the characteristics of new generations of aerospace engineers, the growth of employment opportunities in the A&D industry coupled with a growing workforce, and the need to complement aerospace engineering education.

The purpose of this study is to explore the socialization processes and outcomes of newly-hired engineers in the A&D industry. This study aims to provide a high-level overview of socialization phenomena in the context of engineers working in the A&D industry.

To provide a holistic, first-look at socialization in

* Accepted 10 November 2019.

the A&D industry, the actions taken by both newcomers and organizations need to be examined [16]. It has been suggested that, at a high level, organizational tactics and newcomer proactive behaviors work in association to jointly affect newcomer adjustment [15, 16]. For this reason, this study examined organizational tactics and newcomer proactive behavior simultaneously in an attempt to understand the comprehensive nature of socialization processes and outcomes in the A&D industry. Specifically, this study will examine the content, context, and social aspects of the organizational tactics together with information seeking, feedback-seeking, general socializing, networking, relationship building with managers, job change negotiations, and positive framing of the newcomers' proactive behaviors. These socialization processes will be examined simultaneously to determine their effects on the proximal outcomes (i.e., role clarity, task mastery, workgroup integration, and learning) and distal outcomes (i.e., organizational commitment, job satisfaction, turnover intentions, job performance). This comprehensive snapshot will serve as a benchmark from which future studies can examine socialization in the context of A&D organizations. The conclusions drawn from this benchmark will inform the field on how to improve socialization processes in A&D and educate future A&D employees in college.

2. Literature Review

Previous literature shows that newly-hired engineers adjust to their new job positions by engaging in socialization processes [8, 16, 23, 24]. Generally, the success of these socialization processes and the level of overall adjustment is indicated by a handful of socialization outcomes.

2.1 Socialization Outcomes

Literature suggests that successful socialization often leads to outcomes that are desirable to new employees, managers, and organizations [22]. These socialization outcomes can be categorized as either proximal outcomes (primary outcomes) or distal outcomes (secondary outcomes) [25].

Proximal socialization outcomes are outcomes that are immediately affected by socialization processes [10] and are direct representations of the successful achievement of new employee adjustment and learning [25]. Four critical proximal outcomes that have emerged from the literature were examined in this study: role clarity, task mastery, workgroup integration, and newcomer learning [16, 22, 26, 27]. The *role clarity* outcome reflects the newcomer's understanding of their roles and responsibilities. The *task mastery* outcome refers to a newcomer having learned and acquired the skills and information necessary to complete their job responsibilities. The *workgroup integration* outcome is the newcomer's acceptance into the workgroup and refers to the newcomer having developed positive relationships with coworkers [25]. Finally, the *newcomer learning* outcome refers to the acquisition of knowledge that enables newcomers to become contributing members of their organization [16].

On the other hand, distal outcomes are functional and attitudinal outcomes that are mediated by the successful achievement of proximal outcomes [27–29]. The distal outcomes examined in this study include job performance, turnover intentions, organizational commitment, and job satisfaction. *Job performance* describes a newcomer's level of performance relative to peers. *Turnover intentions* are the newcomer's inclination to quit his/her job. *Organizational commitment* refers to the newcomer's acceptance of and belief in the organization's principles, which prompts the newcomer to exert effort for the organization [30]. *Job satisfaction* refers to the newcomer's contentment and fulfillment in his/her role in the organization. The distal socialization outcomes are important indicators of socialization because they provide global indicators of successful achievement of newcomer adjustment outcomes [25]. Furthermore, compared to proximal outcomes, distal outcomes are important and intuitive to organizational leaders, which may help to increase non-academic professionals' understanding of the benefits of engineering socialization [103].

2.2 Socialization Processes

The proximal and distal socialization outcomes have been predicted by different socialization processes [22]. One consistent finding from the literature suggests that newcomer socialization processes, categorized as either organizational tactics or newcomer proactive behaviors, are significant predictors of socialization outcomes [16].

2.2.1 Organizational Tactics

Organizational tactics are onboarding processes that organizations use to reduce uncertainty, share and clarify expectations, and stimulate learning environments [31]. This framework was proposed by Van Maanen and Schein [31] and was later modified by Jones [20] to consist of three domains: organizational context, content, and social aspect tactics. *Context tactics* describe the context through which information is provided to the newcomer [20]. *Content tactics* describe the content or type of information that is provided to the newcomer [20]. *Social aspect tactics* describe the quality of social interactions between the newcomer and their workgroup [20].

The level of three organizational tactics can be described on a continuum of socialization [8, 11, 32] as presented in Table 1. On one end of the continuum, organizational tactics are described as ''institutionalized'' organizational tactics. These tactics are provided in a highly structured manner [20, 33]. On the opposite end of the continuum, ''individualized'' organizational tactics consist of organizational tactics that generate high levels of uncertainty and are often perceived as having a ''sink-or-swim'' or ''trial-and-error'' nature [16, 34]. Examples of individualized organizational tactics include organizations that have unstructured orientation programs as well as organizations that intentionally withhold information to encourage newcomers to respond in a particular way [20].

The consensus among existing studies is that institutional organizational tactics lead to the newcomer's achievement of all four proximal outcomes [8, 16, 22, 27, 29, 33, 35–37]. Furthermore, institutional organizational tactics lead to several positive distal outcomes including high job satisfaction, high organizational commitment, and low turnover intentions [8, 16, 17, 20, 36, 38]. Conversely, however, most research agrees that individualized organizational tactics do not positively influence a newcomer's socialization because they increase ambiguity, uncertainty, and abandonment [16, 17].

2.2.2 *Proactive Behaviors*

In addition to the onboarding process initiated by organizations, newcomers often engage in proactive behaviors as a socialization strategy when faced with uncertainty and insufficient information [7, 15, 16, 21, 39, 40]. A newcomer's proactive behaviors are socialization processes that emphasize the newcomer as an active participant in the socialization process, rather than someone who passively socializes based on given institutionalized organizational tactics [15, 16]. Proactive behaviors are different from individualized organizational tactics because proactive behaviors describe an unsolicited initiative taken by the newcomer, while individualized organizational tactics describe a lack of action taken by an organization (e.g., organization withholds information from a newcomer).

Ashford and Black introduced a model of proactive behavior that identifies the following seven proactive behaviors: *Information seeking*, *feedback-seeking*, *general socializing*, *networking*, *relationship building with managers*, *job-change negotiating*, and *positive framing* [21]. These behaviors are described in Table 2.

Previous research has empirically shown that proactive behaviors also result in newcomers' adjustment and distal outcomes. Generally, the proactive behaviors shown in Table 2 result in the achievement of all four proximal outcomes [22, 37, 40]. Similarly, these proactive behaviors have also been shown to beneficially impact the four distal outcomes [7, 16, 40].

Given the previous study findings on the importance of organizational tactics and proactive behavior on proximal and distal socialization outcomes,

Table 1. Organizational tactics (Modified from Jones [20])

	Institutionalized Organizational Tactics: Highly structured process	**Individualized Organizational Tactics:** Unstructured process
Context: Context through which organizations provide information	Group learning that occurs outside of the workgroup	Individual learning that occurs simultaneously with work
Content: Content or type of information that is provided to the newcomer	Specific sequence of events that enables the newcomer to easily infer their socialization progress	Random sequence of events in which the progress of socialization is difficult to infer
Social Aspects: Quality of social interactions between newcomer and their workgroup	High quality social interactions that enable social support and positive feedback	Little opportunity to engage in high quality interactions and a lack of social support and positive feedback

Table 2. Newcomer proactive behaviors ([21])

Proactive Behaviors	**Description**
Information Seeking	Actively searching for information
Feedback-Seeking	Actively searching for feedback
General Socializing	Actively interacting with co-workers and supervisors
Networking	Actively developing relationships with professionals external to the newcomer's workgroup
Relationship Building with Managers	Actively developing a high-quality relationship with the newcomer's manager
Job-Change Negotiating	Actively engaging in discussions to alter the newcomer's roles and responsibilities
Positive Framing	Actively adopting an optimistic perspective on situations

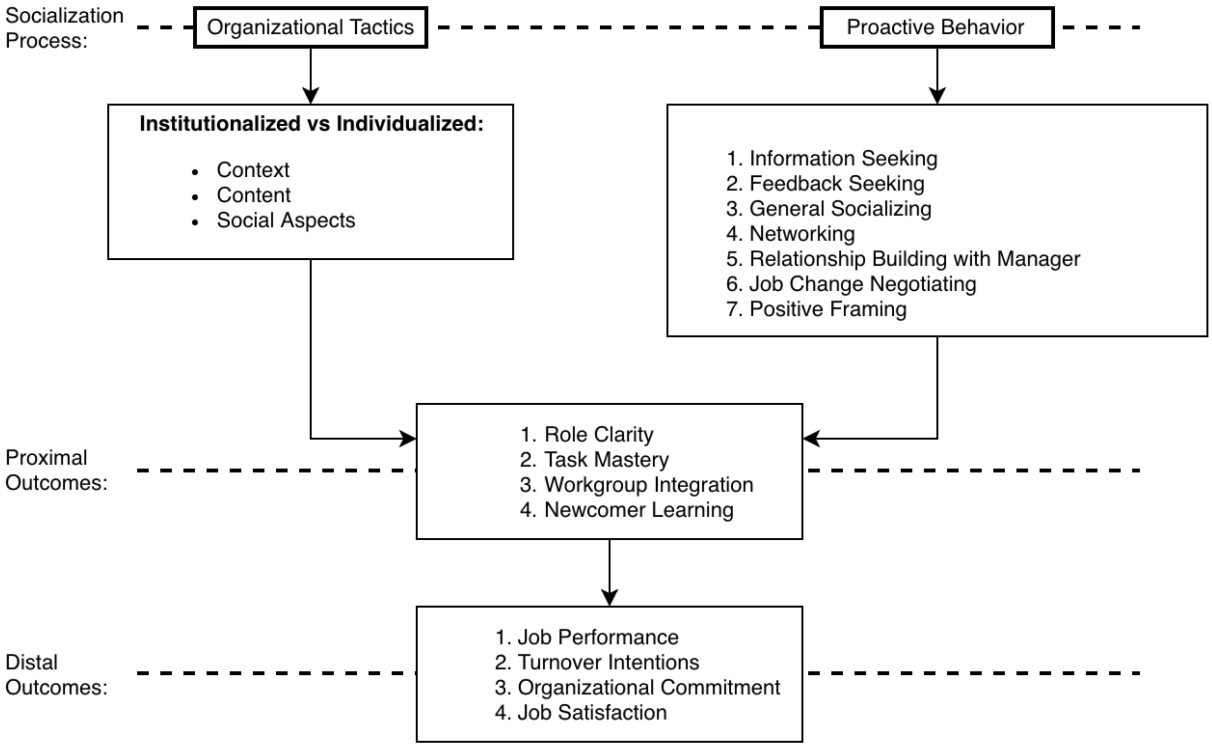

Fig. 1. Framework for socialization processes and socialization outcomes.

these two socialization processes were examined to identify their associations with socialization outcomes of newcomers in A&D organizations in this study. Figure 1 provides the overall representation and relationships between socialization processes and outcomes discussed.

A review of the socialization literature [22, 27] highlights several key research gaps concerning socialization processes and socialization outcomes. Much of the socialization research has focused on distal socialization outcomes such as organizational commitment, job satisfaction, and turnover intentions [12, 22, 27]. Subsequent research has made limited attempts to examine proximal outcomes and only recently has socialization research begun to seriously investigate proximal socialization outcomes. In most of the studies that have analyzed proximal outcomes, a single proximal outcome is often examined independently of other proximal outcomes. For example, Saks, Uggerslev, and Fassina [27], Kowtha [38], and Kammeyer-Mueller, Livingston, and Liao [41] primarily focused on role clarity. Nifadkar and Bauer [42] focused on task mastery. Ashforth, Sluss, and Saks [16] only examined learning as a proximal outcome. Chan [43] only examined workgroup integration. However, for a complete understanding to exist, all major proximal outcomes must be studied simultaneously to comprehensively understand their connection with socialization processes. This study builds upon existing literature by simultaneously examining organizational tactics and proactive behaviors and the influences that they have on all major proximal outcomes.

Finally, the time required to achieve socialization has been a continual concern and disagreement among many researchers. Although it's widely accepted that organizational socialization is a gradual, on-going process in which individuals and organizations "change over time," there is still substantial variation regarding the time-period over when socialization occurs. While many studies reference the 0 to 6 month timeframe [22], several other studies claim that significant socialization outcomes are realized throughout longer timeframes. For instance, some studies argue that socialization outcomes arise well into the 1-2 year range after organizational entry [24, 33, 44, 45]. To reconcile these differences, this study employs latent profile analyses in the hopes that a concrete "time to adjustment" factor is revealed.

2.3 Aerospace and Defense Setting

There is a need to study the socialization processes and outcomes of A&D industry engineers due to (1) their effect on the U.S. economy, (2) the mismatch between newcomer expectations and industry realities, (3) the growing employment opportunities in the A&D field coupled with a growing workforce,

and (4) the need to complement aerospace engineering education.

The A&D industry makes a substantial contribution to U.S. exports [46]. Since 2010, the contribution of the A&D industry exports to total U.S. exports has increased from 7.1% in 2010 to 10.1% in 2016 [47]. During this same period, the exports from the A&D industry made the largest contribution to the total U.S. exports among all industries [47, 48]. Logic suggests that any improvement to the socialization processes of the newly-hired A&D engineers may benefit the U.S. economy. Specifically, findings from socialization research can help newcomers quickly adjust and learn about their roles, while reducing turnover and increasing job performance outcomes that would help organizations retain higher-performing engineers for more extended periods.

Additionally, there appears to be a gap between the new millennial generation's perception of the A&D industry and the actual state of the A&D industry. Many newly-hired engineers enter the A&D profession because they have dreams about the "faster, higher, farther" A&D culture [49] but are soon disappointed when their expectations do not match reality [50]. When newly-hired A&D engineers have unrealistic expectations of the industry, their socialization outcomes are hindered [24, 51, 52]. For example, experienced industry experts claim to have observed newly-hired engineers leave the A&D industry after learning that the industry does not match the newcomers' expectations [50]. A study of socialization in the A&D industry serves as a tool to help mitigate the problems of high newcomer turnover and poor satisfaction that stem from disappointment and unmet expectations.

Another reason to study the socialization of new A&D industry engineers is the increase in the number of engineers needed to satisfy the demands of the A&D industry [46, 53]. The recent overwhelming retirement of baby boomer engineers in the A&D industry is vacating important positions that will need to be quickly filled with newcomer engineers [46, 53–56]. This significant transition from experienced engineers to newcomer engineers increases the necessity and importance of quickly socializing newcomer engineers in an effective way. Socialization research focused on newly-hired A&D engineers will help to maximize newcomer performance, retain technical talent, and provide insight regarding how to quickly and effectively fill these vacating engineering positions at A&D organizations.

While the employment opportunities grow due to the retirement of "baby-boomer" engineers, so too does the overall interest in obtaining aerospace engineering educational degrees. The number of aerospace engineering bachelor's degree recipients has grown by 220% from 2000 to 2018 [53]. Naturally, aerospace engineering graduates have a high desire to work at A&D organizations. Given the tremendous increase in the number of graduating aerospace engineers, it is important that socialization in the A&D industry is examined so that A&D organizations and institutions are prepared for the new wave of engineers.

Furthermore, newly-hired engineers' uncertainty is substantially heightened when their educational program does not adequately prepare them for organizational entry [38]. It has been observed that aerospace engineering educational programs are insufficient to meet the market needs of the present and future [57]. For instance, the industry has called for education programs to place more emphasis on developing familiarity and understanding with team projects, systems and design, and the environment [57–59]. Moreover, aerospace educational programs also offer very limited professional development opportunities. In particular, education programs offer little training related to international affairs, ethics and professionalism, and the role that cultural, political, economical, legal, and regulatory matters play in aerospace product development [57–60]. For this reason, greater efforts must be dedicated to improving the performance and effectiveness of newly-hired engineers once they enter A&D organizations. McMasters [46] argues that although the development of engineers begins in an academic setting, it should continue throughout the newcomer's socialization process as the newcomer engineer enters the workforce. Therefore, the onboarding of young A&D engineers at the point of organizational entry must be improved to complement aerospace engineering education [46]. Further research into the socialization of engineers in the A&D industry will help to meet these needs.

3. Research Purpose and Research Questions

The purpose of this study was to examine associations between two types of socialization processes (i.e., organizational tactics and proactive behaviors) and the socialization outcomes of newly hired engineers working in A&D organizations. First, this study examined each domain of organizational tactics (i.e., content, context, and social aspects) and proactive behaviors (i.e., information seeking, feedback-seeking, general socializing, networking, relationship building with managers, job change negotiations, and positive framing proactive behaviors) simultaneously to determine their unique effects on the socialization outcomes. Each

Table 3. Participant demographics

Demographics		% of Total Sample
Age	20–21	4.7%
	22–23	60.5%
	24–25	26.7%
	26–27	2.3%
	28+	5.8%
Ethnicity	African American	5.8%
	Asian	9.3%
	Hispanic	8.1%
	White	75.6%
	Other	1.2%
Gender	Male	77.9%
	Female	20.9%
	Prefer not to answer	1.2%
Education Level	Bachelor's Degree	89.5%
	Master's Degree	10.5%
Engineering Major	Aerospace	29.1%
	Chemical	2.3%
	Computer	12.8%
	Electrical	14.0%
	Industrial	4.7%
	Mechanical	25.6%
	Others	11.6%
Time at organization	0–1 months	19.8%
	2–3 months	18.6%
	4–5 months	8.1%
	6–7 months	14.0%
	8–9 months	2.3%
	10–11 months	12.8%
	12–13 months	11.6%
	14–15 months	2.3%
	16–17 months	3.5%
	18–19 months	2.3%
	22–23 months	1.2%
	24+ months	3.5%

domain of proximal socialization outcomes (i.e., role clarity, task mastery, workgroup integration, and newcomer learning) and distal socialization outcomes (i.e., job performance, turnover intentions, organizational commitment, and job satisfaction) was separately examined. Second, this study aimed to identify holistic profiles that best characterize newly hired engineers' socialization processes based on the domains of organizational tactics and proactive behaviors. The study examined whether new engineers with different types of profiles presented different levels of socialization outcomes. Profile groups of new engineers who best demonstrate successful socialization were identified. The specific research questions for this study are:

1. What types of organizational tactics and new employee's proactive behaviors predict each domain of socialization outcomes in the A&D industry?
2. Do holistic profiles of organizational tactics and new employee's proactive behavior predict socialization outcomes?
   (a) How many profile groups emerge that best characterize new employees' level of organizational tactics and proactive behaviors?
   (b) How does the level of each socialization outcome differ across profile groups?

By examining a combination of organizational tactics and proactive behaviors on proximal and distal outcomes, the study offers a holistic and comprehensive understanding of socialization processes and their impact on socialization outcomes. Further, given that the study focuses on the A&D field, the findings from the research questions can address the opportunities and challenges encountered by organizations and engineers in the field.

4. Methods

4.1 Data Collection

4.1.1 Study Context and Participants

Data was collected in the summer of 2018. All participants in this study met the following criteria: (1) participants had graduated from a U.S. university with an undergraduate degree in engineering, (2) participants were working at an A&D organization at the point of data collection, and (3) participants were working for 24 months or less in their first position after graduation. The 24-month time frame was selected because previous studies reveal that socialization processes and outcomes continue through the 18–24 month period [1, 14, 25, 33, 45, 61, 62]. A description of the study was shared with interested individuals via email, and participants were asked to complete an online survey. The researchers' institutional review board approved the study and consent was received from all participants.

Several methods were used to recruit participants. First, 20 different US-based aerospace engineering universities were contacted for assistance with recruiting potential participants. Of these 20 universities, 3 agreed to share the recruitment material with their engineering program alumni who graduated within 2 years of the time of data collection. Second, one of the researchers used his professional

network in a large A&D organization to recruit participants. In total, 157 newly-hired engineers completed the survey during the data collection period. Of the 157 total survey responses, 47 responses were discarded due to incomplete data. Another 24 responses were discarded due to ineligible participants completing the survey (e.g., participants who did not work in A&D organizations or those who did not work in their first engineering positions after graduating from college). The final sample of participants consisted of 86 participants

Demographic information about the participants is presented in Table 3. The sample of participants in this study is representative of the U.S. A&D industry sample of engineers. The A&D industry workforce consists of 85.5% male engineers and 75.3% white engineers [63]. Comparatively, the sample of participants in this study consisted of 77.9% male engineers and 75.6% white engineers.

4.1.2 Measures

An online survey was developed to measure two sets of socialization processes (i.e., organization tactics and proactive behaviors) and two sets of socialization outcomes (i.e., proximal and distal outcomes).

Organization tactics. The organization tactics were measured using Cable et al.'s survey [33], which includes 12 items intended to measure three domains of organizational tactics: (1) context ($n = 4$ items), (2) content ($n = 4$ items), and (3) social aspects ($n = 4$ items). Each item was rated using a 7-point scale with "1" = strongly disagree and "7" = strongly agree. Low scores on the scale indicate individualized tactics, and high scores indicate institutionalized tactics. The mean scores of each of the three organizational tactics were used in analyses.

Proactive behaviors. The newcomer proactive behaviors were measured using the 24 items developed by Ashford and Black [21]. The survey measured the 7 domains of proactive behaviors including information seeking ($n = 4$ items), feedback-seeking ($n = 4$ items), general socializing ($n = 3$ items), networking ($n = 3$ items), relationship building with managers ($n = 3$ items), job change negotiations ($n = 4$ items), and positive framing proactive behaviors ($n = 3$ items). Each item was rated using a 5-point scale with "1" = to no extent and "5" = to a great extent, with high scores indicating that newcomers initiated proactive behaviors. Mean scores

Table 4. Surveys used to measure socialization processes and socialization outcomes

Measure	No. of items	Likert scale range	Reference	Reliability (Cronbach's alpha)
Socialization Process: Organization Tactics				
Context	4	1 to 7	[33]	0.68
Content	4	1 to 7		0.81
Social Aspects	4	1 to 7		0.73
Socialization Process: Proactive Behaviors				
Information Seeking	4	1 to 5	[21]	0.80
Feedback-Seeking	4	1 to 5		0.90
Job Change Negotiations	4	1 to 5		0.81
Positive Framing	3	1 to 5		0.76
General socializing	3	1 to 5		0.85
Relationship Building with Managers	3	1 to 5		0.85
Networking	3	1 to 5		0.90
Socialization Outcomes: Proximal Outcomes				
Role Clarity	6	1 to 7	[8]	0.91
Task Mastery	7	1 to 5	[6]	0.75
Workgroup Integration	4	1 to 5	[8]	0.87
Newcomer Learning	40	1 to 5	[65]	0.96
Socialization Outcomes: Distal Outcomes				
Job Performance	5	10 to 100	[66]	0.90
Turnover Intentions	3	1 to 5	[67]	0.71
Organizational Commitment	8	1 to 7	[32]	0.81
Job Satisfaction	1	1 to 10	–	–

of each of 7 proactive behaviors were used in analyses. The Ashford and Black [21] scale has been used in previous engineering socialization studies (e.g., [16]).

Socialization outcomes. The complete socialization outcome survey consisted of 74 questions. These question items were from multiple resources, capturing 4 domains of proximal socialization outcomes and 4 domains of distal socialization outcomes.

Role clarity was measured using Kowtha's 6-item, 7-point Likert scale [8] modified from Rizzo, House, and Lirtzman [64]. Task mastery was measured using the 7-item, 5-point Likert scale developed by Morrison [6]. Workgroup integration was measured using Kowtha's 4-item, 5-point Likert scale [8] variation of Morrison's workgroup integration questionnaire [6]. Newcomer learning was measured using the 40-item, 5-point Likert scale developed by Morrison [65]. Previous engineering socialization studies have used these measures [8, 16]. Job performance was measured using a 5-item scale developed by Pearce and Porter [66], which asks newcomers to rank several aspects of their job performance as a percentile (10th percentile to 100th percentile) compared to their peers. This questionnaire was originally administered to National Aeronautics and Space Administration (NASA) engineers and has been used in previous engineering socialization studies [21]. Turnover intentions were measured using the 3-item, 5-point Likert scale developed by Colarelli [67]. Organizational commitment was measured using the 8-item, 7-point Likert scale developed by Allen and Meyer [32]. Prior socialization studies have used Allen and Meyer's [32] and Colarelli's [67] measure (e.g., [68]). Job satisfaction was measured using a 1-item, 10-point Likert scale which asked, "How satisfied are you with your job?"

Table 4 shows the complete list of measures used in the survey, along with the number of items, Likert scale rating, reference, and reliability (Cronbach's alpha) calculated from the current data.

4.2 Data Analysis

Research Question 1 explored whether the new employees' socialization outcomes in the A&D industry were predicted by their socialization processes (i.e., organizational tactics and proactive behaviors). A series of multiple regression analyses were employed using Stata 14.1 [69]. All models included control variables such as gender (male vs.

Table 5. Descriptive statistics of socialization processes and socialization outcomes

Variable	Mean	SD	Minimum	Maximum
Organization Tactics				
Context	4.24	1.28	1	7
Content	4.60	1.28	1.5	7
Social Aspect	5.65	0.96	2.25	7
Proactive Behaviors				
Information Seeking	3.92	0.79	1.75	5
Feedback-Seeking	3.63	0.99	1	5
General Socializing	3.40	1.18	1	5
Networking	3.53	1.10	1	5
Relationship Building	3.42	0.96	1	5
Job Change Negotiating	2.45	0.98	1	5
Positive Framing	4.27	0.66	2	5
Proximal Outcomes				
Role Clarity	5.19	1.19	1.33	7
Task Mastery	3.46	0.62	2	5
Workgroup Integration	4.38	0.66	2	5
Newcomer Learning	3.79	0.66	2	5
Distal Outcomes				
Organizational Commitment	4.71	0.97	2	6.75
Job Satisfaction	7.62	1.68	2	10
Turnover Intentions	1.86	0.98	1	4.33
Job Performance	73.53	16.105	26	100

Table 6. Association between new employees' socialization processes and socialization outcomes

	Proximal Socialization Outcomes								**Distal Socialization Outcomes**							
	Role Clarity		**Task Mastery**		**Workgroup Integration**		**Newcomer Learning**		**Organization Commitment**		**Job Satisfaction**		**Turnover Intentions**		**Job Performance**	
	b	***p***	***b***	***p***	***b***	***p***	***b***	***p***	***b***	***p***	***b***	***p***	***b***	***p***	***b***	***p***
Socialization Processes																
OT-Context	0.06		0.08		–0.04		0.05		0.05		0.17		–0.07		0.85	
OT-Content	0.19	*	–0.03		0.00		0.17	***	0.13		0.09		–0.05		0.05	
OT-Social Aspect	0.44	***	0.13		0.29	***	0.17	**	0.11		0.60	*	–0.21		–0.42	
PB-Feedback-Seeking	–0.11		0.02		0.03		0.08		0.12		0.25		–0.02		–1.72	
PB-Job-Change Negotiation	–0.02		–0.03		–0.08		<0.00		–0.09		0.07		0.15		1.11	
PB-Positive Framing	0.13		–0.06		0.06		0.10		0.32		–0.11		–0.17		2.81	
PB-General Socializing	–0.08		–0.07		0.14	*	–0.02		–0.03		–0.08		0.10		0.39	
PB-Relationship Building with Managers	0.27	*	<0.00		0.00		0.08		–0.07		0.11		0.08		–1.48	
PB-Networking	0.03		0.19		0.08		0.12	*	0.22		–0.06		–0.07		4.15	
PB-Information Seeking	0.25		–0.03		–0.17		0.13		0.02		0.04		–0.05		0.52	
Controls																
Gender (1 = male)	0.07		0.02		0.07		0.12		0.14		–0.09		0.02		5.20	
Age	–0.04		0.09		0.05		–0.04		–0.04		0.24		0.02		–2.21	
Ethnicity (1 = White)	–0.69		–0.21		–0.17		0.05		0.50		<0.00		–0.48		–3.95	
Education (1 = BS)	0.12		–0.12		0.04		–0.08		0.34		0.24		–0.28		–5.09	
Major (1 = non Aero & Mech. Eng.)	–0.46		–0.08		0.05		–0.09		0.03		–0.08		–0.03		–3.34	
Time at organization	–0.02		–0.03		–0.03		–0.01		–0.02		–0.03		0.02		–0.54	
Time in position	0.07		0.04		0.06		0.01		–0.02		–0.03		0.06		1.21	
Intercept	0.21		2.43		2.43		0.01		0.64		1.98		4.10		58.23	
Adjusted R-square	0.51		0.01		0.30		0.65		0.11		0.06		0.05		–0.03	

Notes. * $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$; OT = Organizational Tactics, PB = Proactive Behavior, Eng. = Engineering.

female), age, ethnicity (white vs. non-white), education level (Bachelor's degree vs. higher), major (Aerospace/Mechanical Engineering vs. other Engineering disciplines), time at the organization, and time in position. Analyses were performed separately for each socialization outcome. All socialization processes were tested simultaneously in each model to identify the unique predictability of each socialization process for socialization outcomes, above and beyond potential effects of other socialization processes.

Research Question 2 explored two sets of questions. First, holistic profiles that best characterize newly hired engineers' socialization processes were identified based on 10 domains of socialization processes reflecting organization tactics (3 domains) and new engineers' proactive behaviors (7 domains; Research Question 2a). Mplus [70] was used to conduct a Latent Profile Analysis (LPA) [71]. LPA was used to classify underlying subgroups or latent profile groups based on the 10 socialization processes. Models were estimated starting from one profile and added one additional profile to the previous profile model. Then, the best fitting model was identified comparing goodness-of-fit criteria for different numbers of profile models. The following goodness-of-fit criteria were used: the Akaike Information Criterion (AIC) [72], Bayesian Information Criterion (BIC) [73], adjusted BIC [74], Vuong-Lo-Mendell-Rubin likelihood ratio test (VLMRT) [75–76], and entropy statistic [77]. Second, once the best fitted number of profile groups had been identified, a series of multiple regression analyses were employed using Stata 14.1 [69] to examine whether the profile groups presented different levels of socialization outcomes (Research Question 2b). Analyses were performed separately for each socialization outcome. All control variables used in Research Question 1 were used for these models as well.

5. Results

5.1 Research Question 1

Research Question 1 examined whether various types of new employees' socialization processes uniquely predict their socialization outcomes. Descriptive statistics for the socialization processes are presented in Table 5, and the findings from a series of multiple regression analyses are presented in Table 6 for each socialization outcome.

Results showed that higher scores in employees' role clarity were predicted by higher scores in organizational content ($b = 0.19$, $p \leq 0.05$), organizational social aspect ($b = 0.44$, $p \leq 0.001$), and employees' relationship building with managers ($b = 0.27$, $p \leq 0.05$). The model explained 50.71% of the variance in role clarity. Findings from workgroup integration showed that higher scores in organizational social aspect ($b = 0.29$, $p \leq 0.001$) and employees' general socializing ($b = 0.14$, $p \leq 0.05$) were associated with higher scores in workgroup integration. The model explained 29.98% of the variance in workgroup integration. Higher scores in newcomer learning were predicted by organizational content ($b = 0.17$, $p \leq 0.001$), organizational social aspect ($b = 0.17$, $p \leq 0.05$), and employees' networking ($b = 0.12$, $p \leq 0.05$). The model explained 65.1% of the variance in newcomer learning. The findings for job satisfaction showed that higher scores in organizational social aspect ($b = 0.60$, $p \leq 0.05$) were related to higher scores in job satisfaction. Approximately 5.56% of the variance in job satisfaction was explained by the model. None of the socialization processes (i.e., organizational tactics and proactive behaviors) were found to relate to task mastery, organizational commitment, turnover intentions, and job performance socialization outcomes.

5.2 Research Question 2

Research Question 2 examined whether holistic profiles of new employees' organizational tactics and proactive behavior predict their socialization outcomes. First, the underlying profiles groups were classified based on new employers' level of socialization processes (i.e., organizational tactics and proactive behaviors). Models were estimated from a 1-profile solution up to a 4-profile solution. The decision about the number of profile groups was made by empirical evaluation. As reported in Table 7, three information criteria (AIC, BIC, and adjusted BIC) showed a bigger drop in values from 1- to 2-profile groups than the drops from 2- to 3-profile groups or the drops from 3- to 4-profile groups, indicating better fit improvement from 1 – to 2-profile groups than others. All profile models showed entropy statistic values above 0.80, which is often used as a cut-off value for a good model fit index in practice (e.g., [78]). The log-likelihood tests (VLMRT and LMRT) showed that the 2-profile had a statistically significantly better fit than the 1-profile model at the $p < 0.05$ level, indicating a significant improvement in fit from 1 profile to 2 profiles. The 3- and 4-profile models did not improve model fit from the 2-profile model. Considering results from these fit statistics and the practically meaningful distribution of employees across profiles, the 2-profile solution was selected as the model that best fits the data (see Fig. 2).

The 2-profile model classified 53.49% of participants as Profile 1, which was labeled the Higher Functioning Group, 46.51% of participants as Profile 2, which was labeled the Lower Functioning

Table 7. Comparison of goodness-of-fit criteria for different latent profile solutions (N = 86)

Group	Profile class solutions			
	1	**2**	**3**	**4**
AIC	2467.35	2355.76	2329.93	2315.06
Δ AIC	–	–111.60	–25.83	–14.87
BIC	2516.44	2431.84	2433.01	2445.14
Δ BIC		–84.60	1.17	12.13
Adjusted BIC	2453.34	2334.03	2300.50	2277.92
Δ Adjusted BIC	–	–119.30	–33.54	–22.58
VLMRT		0.01660	0.35020	0.41290
LMRT		0.01800	0.35780	0.42030
Entropy	–	0.841	0.836	0.857
% Class 1	1.00	0.46512	0.20	0.19
% Class 2		0.53488	0.19	0.45
% Class 3			0.62	0.12
% Class 4				0.24

Notes. AIC = Akaike's Information Criterion; BIC = Bayesian Information Criterion; VLMRT = Vuong-Lo-Mendell-Rubin test; LMRT = Lo-Mendell-Rubin adjusted test.

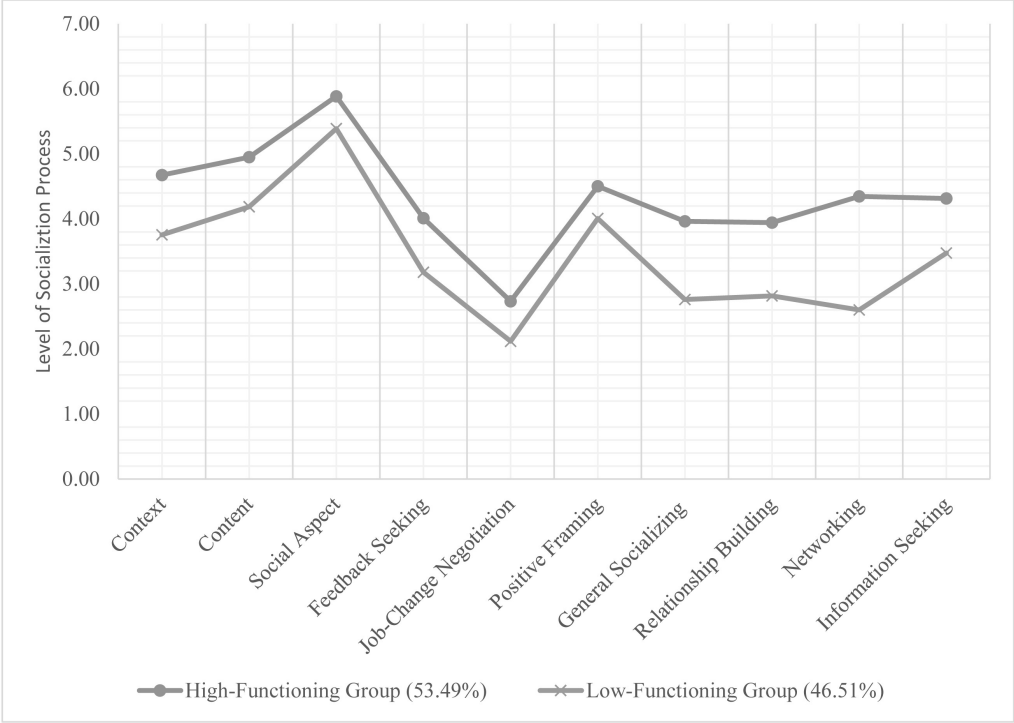

Fig. 2. Higher-functioning and lower-functioning profile groups.

Group. Group comparisons tests, such as chi-square tests (for categorical variables) and t-tests (for continuous variables) showed that no profile group differences were found in gender (male vs. female), ethnicity (white vs. non-white), education level (Bachelor's degree vs. higher), major (Aerospace/Mechanical Engineering vs. other Engineering degree), and age. Statistically significant group differences were found in time at organization ($p < 0.05$) and time in position ($p < 0.05$), showing higher scores on time at organization (5.20 [approximately 8 months] vs. 3.54 [approximately 4.5 months]) and time in position (4.95 [approximately 7 months] vs. 3.54 [approximately 4.5 months]) for the Higher Functioning Group than the Lower Functioning Group. Average employees in the Higher Function-

Table 8. Socialization profile groups predicting socialization outcomes

	Proximal Socialization Outcomes								**Distal Socialization Outcomes**							
	Role Clarity		**Task Mastery**		**Workgroup Integration**		**Newcomer Learning**		**Organization Commitment**		**Job Satisfaction**		**Turnover Intentions**		**Job Performance**	
	b	***p***	***b***	***p***	***b***	***p***	***b***	***p***	***b***	***p***	***b***	***p***	***b***	***p***	***b***	***p***
Socialization Profile group																
Higher functioning vs. Lower functioning (ref.)	0.83	***	0.36	*	0.39	**	0.70	***	0.53	*	0.79		–0.24		8.80	*
Controls																
Gender (1 = male) =	0.14		0.07		0.07		0.03		0.01		–0.05		–0.01		4.88	
Age	–0.13		0.09		0.08		–0.08		0.01		0.10		0.01		–1.61	
Ethnicity (1 = White)	–0.70	**	–0.20		–0.09		–0.01		0.37		0.03		–0.41		–5.28	
Education (1 = BS)	–0.14		–0.08		–0.10		–0.18		0.31		–0.09		–0.20		–2.74	
Major (1 = non Aero & Mech Eng.)	–0.35		–0.04		–0.01		0.02		0.13		0.08		–0.07		–3.11	
Time at organization	–0.04		–0.02		–0.05		–0.01		–0.01		–0.05		0.03		–0.41	
Time in position	0.10		0.04		–0.09		0.02		–0.01		0.03		0.07		1.13	
Intercept	5.56		3.12		3.94		3.67		3.85		7.09		2.12		73.89	
Adjusted R-square	0.24		0.08		0.10		0.25		0.01		–0.04		0.03		0.07	

Notes. *$p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$; ref. = reference; Eng. = Engineering.

ing Group presented higher average scores in all socialization outcomes than did the Lower Functioning Group.

After classifying profile groups, the research team employed multiple regression analyses to examine whether new employees' socialization outcomes differ between the two profile groups (i.e., Higher Functioning vs. Lower Functioning). As shown in Table 8, the Higher Functioning Group scored higher in all outcomes except for two. For job satisfaction and turnover intentions, no difference was found among the two profile groups. For the remaining socialization outcomes, statistically significant differences were found between the Higher Functioning and Lower Functioning Groups. Specifically, the Higher Functioning Group, relative to the Lower Functioning Group, presented significantly higher scores in role clarity ($b = 0.83$, $p \leq 0.001$), in task mastery ($b = 0.36$, $p \leq 0.05$), workgroup integration ($b = 0.39$, $p \leq 0.01$), newcomer learning ($b = 0.70$, $p \leq 0.001$), organizational commitment ($b = 0.53$, $p \leq 0.05$), and job performance ($b = 8.80$, $p \leq 0.05$).

6. Discussion

This study investigated the relationships between socialization processes (i.e., organizational tactics and proactive behaviors) and proximal and distal socialization outcomes of newcomer engineers working in the A&D industry. The study also examined whether holistic profiles of organizational tactics and new employees' proactive behaviors predict their socialization outcomes.

6.1 Socialization Process and Proximal Outcomes

6.1.1 Importance of Social Aspect Tactics and General Socializing on Proximal Outcomes

Socially oriented processes of socialization had a frequent and significant positive relationship with many socialization outcomes. Socially oriented processes are shown to have a positive relationship with three key proximal outcomes: a newcomer's ability to socially integrate into their workgroup (i.e., workgroup integration), a newcomer's ability to understand their roles and responsibilities (i.e., role clarity), and newcomer learning. These results suggest that newcomers in the A&D industry achieve adjustment to their new job positions by frequently interacting with coworkers and managers, networking with colleagues, and developing strong, positive relationships with colleagues. Research on social mechanisms in engineering settings supports this finding by revealing that informal communication, group work, and social interactions play an important role in engineering workplace settings [79]. Furthermore, previous socialization studies corroborate the observed importance of social processes for newcomer socialization ([8, 10, 14, 16, 62, 80]. The findings from the present study build upon prior research by indicating (1) that the newcomer's workgroup is the largest and most important setting for newcomer socialization in A&D organizations and (2) that a higher frequency and quality of social interactions improves the newcomer's overall adjustment in an A&D industry setting. The complexity of engineering roles in A&D organizations likely encourages the frequent use of social mechanisms to adjust to new positions. Furthermore, newcomer engineers likely rely on social mechanisms because newcomers are accustomed to social learning mechanisms in university engineering programs [81–83].

The key proximal outcomes of role clarity, workgroup integration, and newcomer learning simultaneously have significant relationships with both organization-driven tactics and individual-driven proactive behaviors. This indicates that *both* the organization *and* the newcomer must actively exert effort to achieve socialization outcomes. For instance, workgroup integration is related to the social aspect organizational tactics as well as the proactive behaviors of general socializing. This finding suggests that in addition to the organization providing opportunities for social interaction and support, the newcomer must also make a proactive effort to build a relationship with coworkers through frequent interactions. It appears that newcomers also actively seek out social interactions with their coworkers, possibly because they perceive their coworkers to be a significant source of information about the requirements and responsibilities of their positions [84]. The results of the present study indicate that newcomers in the A&D industry are most effectively adjusted through some combination of organizational tactics and newcomer proactive behaviors. Future research can build upon these findings by examining more precise combinations of tactics and proactive behaviors.

6.1.2 Association between Content Tactics and Proximal Socialization Outcomes

A newcomer's ability to discern their progress of adjustment to their new position (i.e., content tactics) is also related to two key proximal outcomes: role clarity and newcomer learning. Experiences that provide newcomers with insight regarding their adjustment progress are related to the newcomers' ability to learn and clearly understand their roles and responsibilities. Previous studies support this finding [8, 10, 85] and suggest that newcomers feel competent regarding their role definitions when they can discern, understand, and

interpret their progress adjusting to their job position [86].

6.1.3 *Importance of Organizational Tactics for Proximal Socialization Outcomes*

Although the proximal socialization outcomes measured in this study are associated with both organizational tactics and newcomer proactive behaviors, results show that newcomer's socialization outcomes are associated with more number of organizational tactics than proactive behaviors. This result indicates the important role that organizations have in their newcomer socialization process. The literature suggests that newcomer engineers prefer a highly structured environment that will help guide them through their socialization process [44]. Recent literature also suggests newcomer engineers find proactive behaviors, such as information-seeking, particularly challenging [99]. The results from this study indicate that this attitude may be even more prominent for newcomers in the A&D organization. Newly-hired engineers might heavily rely on institutionalized organizational tactics because organizational tactics have a recognizable similarity to the highly structured environments in academic engineering programs and higher education.

6.1.4 *No Association between Socialization Processes and the Task Mastery Outcome*

The results of the present study reveal that a newcomer's task mastery, that is, skills required for a job, is unrelated to any of the socialization processes that were examined in this study. This result contradicts prior research findings [8, 35] and may provide insight into how A&D socialization differs from that in other industries. A significant collection of socialization research agrees that newcomers quickly adjust to their positions within 6 to 7 months after entry [33, 42, 87–89]. Participants in our study had been working in their positions for approximately 7 months, on average. Participants in the present study may not had achieved task mastery yet, perhaps because the adjustment period for newcomers in the A&D industry lasts significantly longer than in other industries. Other studies argue that newcomers do not master their situations until they have worked for approximately 9–12 months in their positions [34, 90]. The socialization adjustment period in the A&D industry context may follow this timeframe of 9 months or longer. It is also possible that unforeseen factors affect task mastery more than the socialization processes examined in this study. Due to the highly technical and complex skills required for engineering positions in the A&D industry, newcomers might default to other resources, such as textbooks, tutorials, internet resources, or other traditional information sources, to accomplish task mastery. The results of the present study indicate that neither organizational tactics nor newcomer proactive behaviors significantly influence task mastery. Given the importance of task mastery [6, 91], additional research is needed to explore which socialization processes develop task mastery in the context of newcomers working at A&D organizations.

6.2 *Socialization Processes and Distal Outcomes*

This study also shows that a newcomer's commitment to an organization (i.e., organizational commitment) and the newcomer's intention to quit (i.e., turnover intentions) were not related to any socialization processes. These results do not conform to prior research [8, 35]. The lack of association between processes and organizational commitment might be attributed to the relatively small amount of time that newcomers in this study have worked in their positions. The first 12 months of a newcomer's position are characterized by abnormally high feelings of affirmation towards the organization. Research refers to this period as the "honeymoon phase" of newcomer socialization [92]. Recent subsequent studies [87] have further explored this phenomenon and have demonstrated that a newcomer's feelings of affirmation (such as job satisfaction and commitment to their organization) do not taper off until approximately 12 months into the newcomer's position. Because much of our sample of newcomers had been working for less than 12 months, the "honeymoon" phenomenon likely explains the lack of relationships between socialization processes and organizational commitment in the A&D industry.

It was also observed that job-change negotiations had no relationship with any socialization outcomes. According to the data from this study, newcomers in the A&D industry engaged less in job-change negotiations compared to other processes. Newcomers are more likely to negotiate their job tasks and responsibilities when they have low job satisfaction. The findings from this study showed that, on average, our sampled newcomer engineers working in A&D organizations have high satisfaction with their jobs (7.62 out of 10). Thus, newcomers in the A&D industry might not negotiate their job responsibilities because they are already content in their job positions.

6.3 *Post-Hoc Analysis of the Latent Profile Analysis*

Latent-Profile Analysis reveals that the duration of time that a newcomer has spent in the organization and position is related to the newcomer's overall

success in socialization in the organization and job position. In particular, newcomer engineers who have worked in their positions for longer periods (approximately 8 months vs. 4.5 months) are generally more successful in their adjustment to the organizations and positions. These findings suggest that a newcomer's persistent effort in a position will likely alleviate adjustment challenges over time. It is also possible that newcomers who have difficulties in socializing to their organizations may quit their jobs. These findings are consistent with previous research [19, 39], which shows associations between job tenure and socialization outcomes. Furthermore, the LPA findings show, newcomers who are in the Higher Functioning group generally exhibit all high socialization processes compared to newcomers who are in the Lower Functioning group. This result may indicate that the majority of socialization processes typically develop together.

7. Implications

A newcomer engineer's understanding of his or her roles and responsibilities is likely to be improved through social mechanisms. Specifically, newcomers should be given strong, positive social support from their coworkers and managers and should be encouraged to develop high-quality relationships with coworkers and managers. In practice, these goals could be most easily achieved through a formal mentorship program in which an experienced engineer works closely with the newcomer engineer to serve as a source for strong social support [14]. Networking events are also likely to promote the achievement of socialization outcomes. Although individuals are typically expected to bear the responsibility of initiating networking, organizations can organize events to help facilitate the networking between newcomers and experienced professionals. Social events should occur periodically, even outside of work. Additionally, newcomers should be encouraged to actively seek out interactions with coworkers and managers. Efforts from both the newcomer and the organization (i.e., coworkers, managers, human resources, etc.) will most effectively sustain socialization outcomes among engineering newcomers in A&D organizations.

As prior research indicates, many academic engineering programs are not sufficiently preparing engineering graduates for organizational entry [57, 93]. The skills and processes associated with organizational socialization should begin in higher education and continue throughout the newcomer's first position [46]. For these reasons, the current findings offer constructive implications in higher educational settings as well. Processes that enable students to easily infer their progress adjusting to classes (i.e., content tactics), provide positive social support to students (i.e., institutionalized social aspects), and build individual relationships with instructors (i.e., relationship building with managers) are examples of such processes that should be implemented. For instance, instructors should frequently engage students and encourage them to interact with one another both during and outside of class to develop social support systems. Mechanisms such as group projects can help engineering students to develop skills and familiarity with social learning and to develop social relationships in the context of work [94]. The relationship developed between undergraduate students and instructors will enable the students to feel comfortable asking for help and participating in class. The inter-student relationships that are developed through social support will increase shared knowledge and understanding among students, and lead to more productive study habits. These phenomena have been shown to result in higher learning and academic performance [100, 101, 102]. Furthermore, well-structured projects can be implemented to encourage newcomers to develop skills and familiarity regarding information-seeking.

The findings from the present study can also be practically applied to design projects (e.g., capstone projects or student-run, industry-sponsored projects [95]) for college engineering programs.
Design projects are intended to simulate real work environments and therefore provide opportunities to expose aerospace engineering students to these socialization practices. While working closely with industry professionals, engineering students should be encouraged to network and build relationships with them. Special events such as seminars, lectures, or instructor guidance can be used to coach engineering students through this process, enabling students to develop these skills before organizational entry.

8. Limitations and Future Research

Several limitations of the study should be noted. The survey responses in this study were collected at only a single moment, providing a "snapshot" of socialization outcomes. Furthermore, the data in this study came from self-reports because newcomers are most apt at describing their own experiences [6]. Because this study was primarily retrospective, the results may miss some changes that occur during the initial stages of socialization [96]. Future research can address this issue by examining the socialization of newcomer engineers in the A&D industry using a longitudinal study design. The longitudinal nature of future studies

will allow researchers to capture changes that occur during the initial stages of socialization.

Another limitation of this study is the relatively small sample size. Although this study had sufficient power to detect two meaningful distinct profile groups of higher functioning and lower functioning new aerospace engineers and thus contribute to the aerospace socialization literature, studies have shown that a large sample size may yield more profiles than a small sample size. Future studies with a large sample size are recommended to determine if any other additional profile groups of new employees' organizational tactics and proactive behaviors exist in A&D organizations.

The findings from the study show potential areas for future research. No socialization processes examined in this study were found to predict some important socialization outcomes. The results indicate that neither organizational tactics nor newcomers' proactive behaviors have any relationship with task mastery, organizational commitment, or turnover intentions. Although the lack of relationships is a valid result, it does not help to identify which actions are related to task mastery, organizational commitment, or turnover intentions. Thus, future research will be needed to identify factors that influence task mastery, organizational commitment, and turnover intentions among newcomer engineers in the A&D industry.

This study further supports the claim that socialization outcomes are achieved through some combination of organizational tactics and proactive behaviors [16, 35, 97]. However, the optimal or most exact combination of organizational tactics and proactive behavior that achieves the highest level of newcomer adjustment remains unknown for the A&D industry. Future research is needed to examine the combination(s) of organizational tactics and newcomer proactive behaviors that result in the successful adjustment of newcomers.

Finally, the impact that demographic variables have on socialization in the A&D industry should be further examined. Research has identified important challenges and differences in socialization outcomes for varying genders and ethnicities [8, 98]. The findings from previous studies could be validated and tested in the context of the A&D industry. Although this study did collect demographic data, the sample size of varying ethnicities and genders was too small to provide any meaningful conclusions. Therefore, future research should investigate the impact that ethnicity and gender differences have on socialization outcomes in the A&D industry.

9. Conclusion

This study sheds light on the relationships that exist between socialization processes and socialization outcomes of newcomer engineers working in A&D organizations. Newcomer engineers in the A&D industry tend to rely heavily on socially-oriented processes to adjust to their new job positions and organizations. A&D organizations should work to create cultures and environments that cultivate social interactions and relationships between the newcomer engineers and their workgroups and managers. Latent-profile analysis has revealed that the time a newcomer has spent in their position and organization plays an important role in socialization processes. Moreover, the results of this study reveal that organizational tactics and proactive behaviors are simultaneously related to socialization outcomes. Thus, newcomers should also be encouraged to proactively make efforts to adjust to their positions and organizations. Academic programs can implement the findings from this study to better prepare undergraduate students for organizational entry. The results of this study reveal that task mastery, organizational commitment, and intentions to quit are not related to any socialization processes. Future research on the socialization of engineers in the A&D industry is needed to reconcile these research gaps and further build upon the socialization research in the context of the A&D industry.

Acknowledgments – The authors wish to thank the National Science Foundation for supporting this work through grant number EEC-1826388. The authors also like to thank the anonymous IJEE reviewers for their thoughtful comments and suggestions.

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