WIP: Undergraduate Socialization in Engineering: The Role of Institutional Tactics and Proactive Behaviors

Introduction

Higher education literature suggests students with low socio-economic status (SES) indicators are more likely to experience difficulties adjusting to college and less likely to participate in co-curricular activities than students with higher SES [1-2]. These findings are problematic given evidence that participation in co-curricular activities in college is related to positive academic and social outcomes including, college adjustment, academic and social integration, and degree attainment [3-4]. This is particularly true in engineering, where participation in co-curricular activities, such as design teams and professional engineering societies, has been shown to promote engineering identity development, graduate school intentions, and plans to pursue engineering careers after graduation.

In this work we posit that it is not simply differences in SES that separate highly involved, successful students in engineering from their less involved, less successful counterparts. Instead we postulate that such differences inform students' *socialization* into engineering and, as a result, their patterns of co-curricular participation. Weidman defines socialization as "the process by which individuals acquire the knowledge, skills, and dispositions that make them more or less effective members of their society" [5]. In this study, we hypothesize that an underlying set of socialization processes, involving institutional tactics and proactive behaviors inform how students become familiar with academic and social contexts in engineering, as well as their patterns of participation in activities that are associated with success.

In this paper, we describe a conceptual model for understanding how students' background characteristics inform their early experiences studying engineering in college, including the co-curricular activities in which they participate, as well as the short- and long-term outcomes related to these experiences. Finally, we describe the development of an instrument designed to test this conceptual model.

Conceptual Model: Undergraduate Student Socialization

Given the centrality of socialization in our hypothesis, we chose Weidman's conceptual model of undergraduate student socialization to guide this study [5]. We chose Weidman's model because of its consideration of the influences of academic and social contexts on student socialization [6]. We modified Weidman's model to include students' experiences with two specific socialization processes--institutional tactics and proactive behaviors--during their first year in college. The modified model is presented in Fig. 1.

Weidman posits a number of influences on the socialization process, as well as a number of outcomes related to undergraduate student collegiate experiences. The model focuses on the role of normative contexts and social relationships to explain socialization processes before and during the college experience. It supposes that students enter college with particular background characteristics (e.g., SES indicators), experiences, and beliefs and dispositions that are informed by pre-college normative pressures. While in college, students experience socialization influences via academic (e.g., major department, co-curricular activities) and social (e.g., living

arrangements, extra-curricular activities) normative contexts, as well as the continuing influence of pre-college normative pressures. Normative contexts, defined as "settings in which students are exposed to ideas and perspectives shaped by experiences with value-laden structures," exert normative pressures on students that either change, or reinforce, academic and social values [6].

While Weidman's model offers variables related to students' socialization experiences, the framework does not explicate a mechanism that underlies varying collegiate experiences and subsequent outcomes. Filling this gap is core to addressing the hypotheses in the present study, as a central goal of this study is to explain what particular socialization experiences inform students' behaviors (e.g., choices in co-curricular activities), and whether those choices are related to selected socialization outcomes.

To explain how SES indicators and other background characteristics lead to varying socialization experiences and subsequent outcomes, we investigate two socialization processes: institutional tactics and proactive behaviors. Ashforth, Sluss, and Saks define *institutional tactics* as "a set of bipolar tactics by which organizations engage in 'people processing'". That is, organizations may process newcomers along a set of binary tactics (e.g., collective vs. individual, formal vs. informal, sequential vs. random) to explicitly, or implicitly, orient newcomers to relevant organizational rules, cultural norms, knowledge, skills, and dispositions [8]. Ashford and Black define *proactive behaviors* as those actions that newcomers undertake to learn about the values, rules, expectations, and norms of an organization or institution [7], including information seeking, relationship building, job-change negotiating, and framing. Our modified conceptual model includes institutional tactics and proactive behaviors as processes that explain differences in students' experiences and outcomes in college. Furthermore, the modified model distinguishes involvement in engineering related co-curricular activities from other forms of extra-curricular involvement in college (e.g., Greek Life, intramural sports).

Instrument Development

We developed a survey instrument based on Weidman's model to test the our hypotheses that student background characteristics are related to students' socialization experiences, and whether their socialization experiences inform their decisions to engage in engineering-related co-curricular activities related to select socialization outcomes. The instrument was designed to reflect the combined contributions of Weidman's undergraduate socialization model, Ashforth, Sluss, and Saks' definition of institutional tactics, Ashford and Black's definition of proactive behaviors, and outcomes such as major satisfaction, engineering identity, intent to persist, and social capital. The instrument includes three sections: (a) background characteristics, (b) collegiate experiences, and (c) socialization outcomes.

Pre-College Characteristics, Resources, and Experiences: While some pre-college and background characteristic variables (e.g., race/ethnicity, gender, SAT/ACT scores, SES indicators) come from institutional databases, data regarding students' pre-college resources and experiences are included in the study instrument. For instance, we ask students if they had access to college-going resources (e.g., SAT preparatory courses, recruitment experiences). We also ask students about pre-college normative pressures (e.g., educational expectations from parents).

Collegiate Experiences: We measure students' first-year socialization processes and their normative contexts during college. Firs, we assess *socialization processes* in two parts: institutional tactics and proactive behaviors. We adapted Ashforth, Sluss, and Saks' scales [8] measuring institutional tactics across six dichotomous dimensions: (a) collective vs. individual, (b) formal vs. informal, (c) investiture vs. divestiture, (d) sequential vs. random, (e) serial vs. disjunctive, and (f) fixed vs. variable tactics. We also adapted Ashford and Blacks [7] scales measuring proactive behaviors across six dimensions: (a) feedback seeking, (b) positive framing, (c) general socializing, (d) relationship building, (e) networking, and (f) information seeking [7]. Though these scales were developed to understand workplace socialization, we adapted them to reflect the context of engineering education. Then, to assess *normative contexts,* we developed a new five-question scale to explore students' involvement in extra- and co-curricular activities. First, we ask students to list engineering-related organizations in which they participated. Second, and germane to the concept of socialization, we ask how students became interested in joining each respective organization. Third, we ask students why they chose to participate (i.e., what were the perceived benefits of joining) each organization. Finally, we ask the extent to which students have maintained their involvement in each organization.

Socialization Outcomes: We chose a set of socialization outcomes that were guided by the model and by our research questions and hypotheses presented above. Four socialization outcomes are included in the study instrument: (a) major satisfaction, using Nauta's seven-item Academic Major Satisfaction Scale [9], (b) engineering identity using Godwin's Engineering Identity Scale [10], (c) academic and career intentions using Mamaril's adaptation of the Persistence in Engineering scale [11], and (d) social capital using an adaptation of the Internet Social Capital Scale developed by Williams [12].

Instrument Refinement

We subjected our instrument to two separate processes for refinement. First, a set of education, engineering, and engineering education researchers reviewed the instrument for clarity and validity. Second, we conducted focus groups with engineering students (N = 8) to establish and address points of confusion, as well as inadequacies with the study instrument.

Future Work

Our goal is to understand the factors that shape students' socialization into undergraduate engineering, as well as the experiences that promote their development into professional engineers. Guided by the modified model described in this paper, we have collected survey data from approximately, 1,000 undergraduate engineers, and our future work involves analyzing both survey and institutional data to understand how background characteristics (e.g., SES indicators, college-going experiences) are related to socialization processes, co-curricular involvement, and academic and social outcomes. We believe results from this study will provide insights that guide institutions to develop more effective methods of socializing students into engineering and, as a result, improve student success in college.

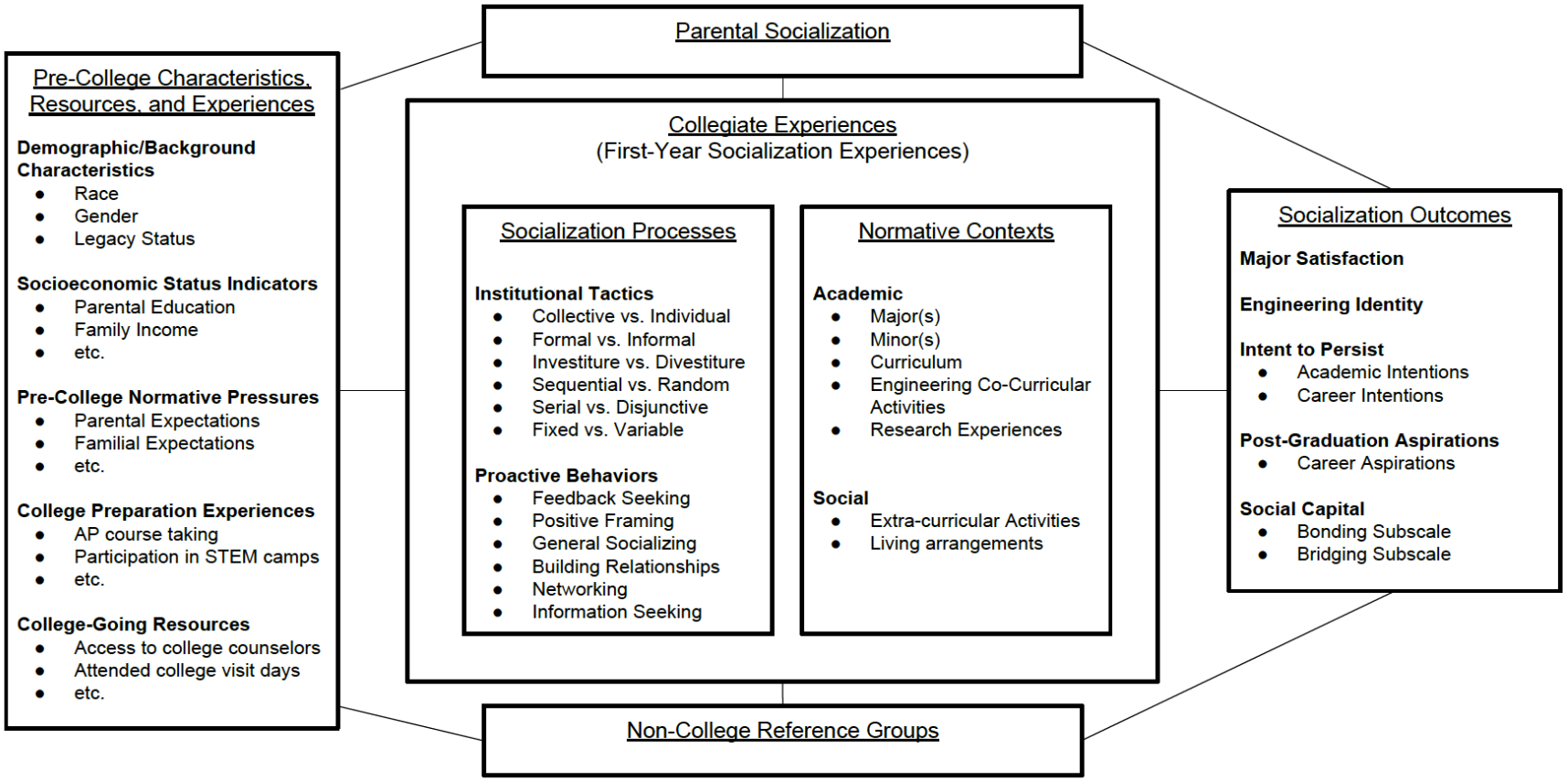

Figure 1. Modified Conceptual Model of Undergraduate Student Socialization

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