Board 59: Shame in Engineering: Unpacking the Socio-Psychological Emotional Construct in the Context of Professional Formation

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Abstract

This paper summarizes the outcomes of early research activity that is related to an investigation on shame in the context of engineering education. We are investigating shame as an individual experience that occurs in the particular sociocultural context of engineering education and practice. We list the research questions below and provide detail regarding our working theoretical model for shame and justification for investigating this in the engineering education context. Furthermore, we provide a summary of our data collection efforts. We are using interpretative phenomenological analysis (IPA) to interview engineering students about their experiences of shame and ethnographic focus groups to describe the landscape of sociocultural expectations that establish a platform for students' experiences with this emotional construct.

Summary of Investigation

This research project seeks to generate robust insight on *shame* as a socio-psychological construct that profoundly informs emotional facets of engineering professional formation, an area that is under-explored yet crucially important in preparing 21st century engineers. We contend that shame represents a ubiquitous yet seemingly invisible phenomenon that pervades both the individual experience and the overall culture of engineering programs. More specifically, based on suggestive evidence from prior engineering education research, we maintain that shame is likely a key mechanism that undergirds socialization processes related to inclusion and exclusion within engineering programs. Therefore, we have organized this study around the following research questions:

RQ1: How do students psychologically experience shame in the context of engineering education?
RQ2: How are these experiences located and socially constructed within the institutional cultures of engineering programs?
RQ3: In the context of engineering education, how do individual, psychological experiences of shame interact with perceived cultural expectations?

In the overall investigation, we are approaching these research questions with a cohesive pairing of qualitative methods. We are investigating the internal experience of shame in engineering students (RQ1) by using interpretative phenomenological analysis (IPA)[30, 31] to conduct and analyze in-depth interviews with 25-27 engineering students from two distinct institutional contexts: a research-focused, public university and teaching-focused, faith-based university. After preliminary analysis of interviews from the IPA study, we will move toward facilitating ethnographic focus groups[32,33] with a total of 45-48 students, stratified across both institutions. The purpose of this ethnographic study will be to probe the sociocultural expectations of dominant cultures that often induce shame in engineering students (RQ2). At the conclusion of both qualitative studies, we will intentionally synthesize the thematic psychological insights from the IPA study and themes from the ethnographic study that describe the sociocultural expectations of what it means to become and be an engineer (RQ3). This synthesis will result in a comprehensive model of shame in the context of engineering, as understood from both the embodied individual and the sociocultural realities of engineering students.

The focus of this particular paper is to provide detail on the frameworks that have informed the present investigation, based on literature from psychology, sociology, and engineering education. Additionally, we provide a brief report on the first year of this project, which focuses on data collection for the IPA portion of the project and early efforts of data collection for the ethnographic portion of the study.

Theoretical Model of Shame

As conceptualized by psychologist Helen Block Lewis, shame is a strikingly painful, self-conscious emotion that involves a global devaluation of the self.[1,2] Further, sociologist Thomas Scheff dubs shame as the "master emotion of everyday life" (p. 239)[3] and defines the construct as a contextually situated experience that results from "a threat to the social bond" (p. 255).[3] From these coupled perspectives, we conceptualize shame as the socio-psychological interaction between cultural expectations and individuals' internal evaluations of how they are meeting these expectations.[1-5]

We develop this investigation in a way that is both oriented toward unpacking individual experience of shame and understanding sociocultural narratives that provide context for this emotional phenomenon. In relation to Lewis's characterization of shame, other psychological researchers have characterized shame "as an assault on the self, where the individual's self-concept, social connection, and sense of power and control come under attack" (p. 233)[6] or "a felt sense of unworthiness to be in connection . . . with the ongoing awareness of how very much one wants to connect with others" (p. 147).[7] Such prior literature has established a consistent framework to understand how individuals experience shame. Specifically, a person's perceived social expectations from others are internalized as a standard for equally subjective, oftentimes harsh, and self-defeating judgments of one's own belonging to the social group.[2,4] Consequently, a person who feels shame is motivated with "the desire to hide, escape, or strike back" (p. 25).[2]

Psychological theory on shame helps us understand the individual and internal experience of this construct, but this emotion does not exist in a social vacuum. Indeed, Scheff concept shame as a construct that arises from a perceived threat to social connection broadly encompasses the interaction between a society's expectations of an individual and the individual's emotional response toward these messages.[3] In fact, studies from marketing research have found that, when presented with a message designed to influence behavior through inducing shame, consumers do not respond with the intended behavior change. Rather, reacting in shame, they defensively process the information and negate the message in order to protect the self.[8,9] Shame, therefore, exists in a culturally situated context where multiple actors play their roles in co-producing shame for others to individually experience.

The synthesis of literature across multiple domains also points to the complex connection between *shame as* internally experienced by individuals and *shame as* socially developed within institutional structures. While some scholars have begun to explore this connection, the psychological and the sociological perspectives remain largely separate in the literature. We propose the intentional blend of two interpretive methods as a novel way to investigate shame in context and as a dynamic interplay between individual experiences and processes of social construction.

Figure 1 presents our theoretical working model of shame and describes the social reality that we are empirically investigating in this project. More specifically, our study will attend to both the internal psychological realities of shame and the co-construction of the social and cultural patterns that can lead to experiences of shame. The former will be captured through IPA and the latter investigated using ethnographic methods. By combining these qualitative approaches, a synthesis of the respective findings will yield a deeper understanding of not only how individuals experience shame but also what cultural conditions enable individuals to construct these experiences.[10] Further, by integrating findings from both methods, we will generate insight on how individual perspectives and social patterns interact and co-evolve in the engineering context to lead to persistent structures of exclusion in our programs.

Shame in Engineering Education and Practice

We investigate shame in the particular context of engineering education based on an informed belief that shame undergirds multiple barriers to promoting cultures of inclusion within engineering education and practice. Much of this research attends to two broad categories: the experiences of marginalized engineering students belonging to specific social groups[11-13] or critical analysis of dominant cultures in
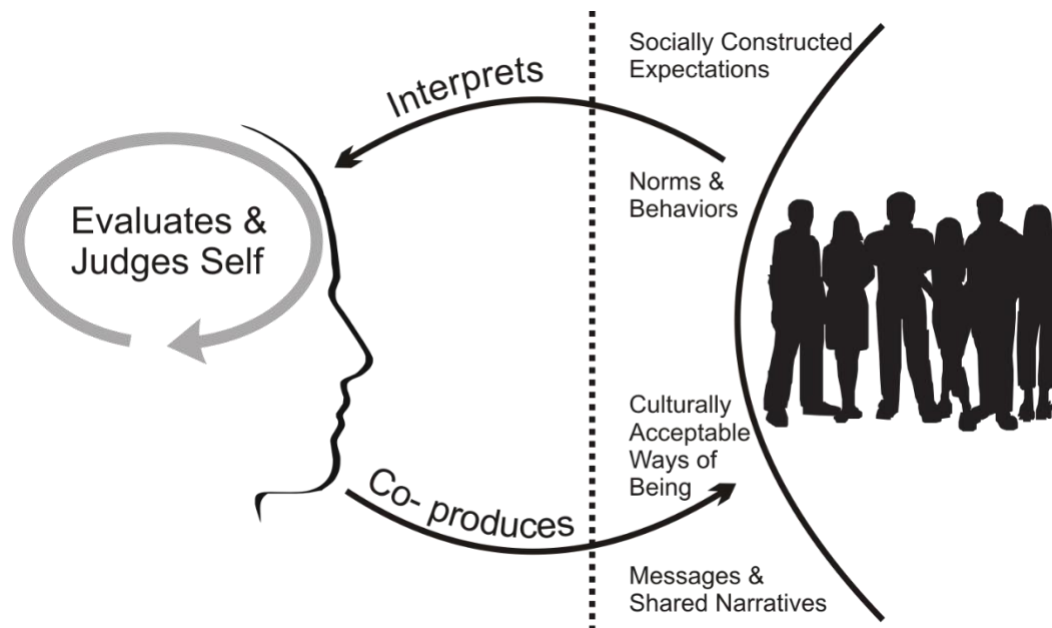
Figure 1: Theoretical working model of shame for proposed investigation.

engineering education and practice.[14,15] Findings from this prior work suggest a need to investigate affective phenomena that underpin how students undergo professional formation, via inclusion or exclusion, in engineering degree programs. In this study, we leverage these findings combined with conceptual understandings from sociology and psychology to examine shame as a key socio-psychological mechanism at the very heart of engineering socialization.

We do note that shame has been studied more generally in educational research as an affective construct that is linked to students' failures at academic tasks. For example, Turner and colleagues studied shame in terms of its relationship to academic motivation, as elicited during such failure.[16,17] Their research focuses specifically on shame as connected to the "processes students use to maintain, increase, or decrease their academic motivation and self-regulation following experiences of academic shame" (p. 140).[16] Based on analyses of quantitative and qualitative data, the results from their research establish empirical connections between shame and self-regulated learning, self-efficacy[18-21], students' academic identities[22-25], and values[26-27]; aspects of student learning and professional formation that are well-recognized in engineering education.

Additionally, when we understand shame as an internal experience of individuals related to social connection, we can see compelling threads of this phenomenon in engineering education research. For example, Foor et al.'s ethnography highlights Inez's painful experience of desiring acceptance by other engineering students.[13] Additionally, in their grounded-theory study on help-seeking behaviors, Herring and Walther highlight how several participants avoided seeking help in classes. As voiced by one of their participants, "I'm thinking about what they think about me, and I don't want to be thought of as that guy that's behind or that guy that's a little bit slower than everybody else" (p. 15).[28] While these examples did not claim an explicit focus on shame, they do point to its powerful existence in engineering education contexts.

Summary of Data Collection

In the first six months of this investigation, we are primarily focused on collecting high-quality data to capture how individuals' experiences live within the theoretical model discussed in the previous section.

In the IPA portion of the investigation, we have completed five in-depth interviews with participants who identify as White men and one who identifies as a White woman.[29] Our data collection efforts particularly focus on the social group of White men, which comprises a notable majority in engineering education in practice, in order to better understand how individual experiences within members of the dominant social group translate to sociocultural practices that may mitigate inclusive efforts of engineering programs. By investigating patterns of shame in White male engineering students, we might unpack, for example, how some individuals attempt to marginalize others as a way of coping with their own experiences in shame.[2] Previous work has established that common narratives in engineering, which include explicit or implicit forms of exclusion, are often formed by members of the dominant social group.[14,15] We seek to understand patterns in how White male students process and respond to their experiences of shame. Such patterns might include transferring shame on other students, hiding the painful emotion through avoidance, or other possible psychological responses.

Thus, the IPA data collection has proceeded in a way that has provided robust data to contextualize and explain the experiences of shame in White male students. Our early insight on this IPA data is informing us to see engineering education experiences more broadly as an exercise of social connection rather than (only) a space to enact academic performances. This insight informs our focus group protocol development to probe expectations of engineering students as a social phenomenon and not confined to questions of engineering competence alone. The immediate next steps in IPA data collection, at the time of this writing, is to collect interviews from White, male students at the research-focused public university. Additionally, in the following year, we will prioritize data collection on students from historically underrepresented backgrounds (i.e., White women, men of color, and women of color) from both institutional contexts.

Additionally, we are currently focusing efforts on collecting focus group at the large, research-focused university. Informed by the early insights of the IPA data collection process, we have gone through multiple iterations to develop and pilot a semi-structured focus group protocol. Specifically, we conducted a focus group with a pilot sample of students that was demographically heterogeneous (in terms of race and gender). This focus group revealed resonances with student experiences of expectations placed on engineers, as well as contrasts between those expectations that seem to be related to identity and cultural background. Subsequent demographically homogeneous focus groups have been conducted or scheduled, including White male mechanical engineers, women in mechanical engineering, and women of color across majors. The homogeneous groups have had the benefit of shared experience (e.g., of the same courses) and seem to allow a comfortable discourse for both dominant and marginalized identity students. Future work will explore other demographics in homogeneous groupings (White male students from other majors, African American and Latino male students) and will select certain heterogeneous groupings (e.g., gender-balanced groups, race-balanced groups) to unpack divergent experiences. Focus groups at the smaller faith-based university are planned to be completed within the first year of this project.

Conclusion

This project, at its core, is an extensive investigation of both individual experiences and cultures of shame, which impact inclusivity in engineering programs. We study this troubling construct in order to describe how engineering programs can promote healthy ways of responding to shame, individually and collectively. By recognizing how shame manifests within our programs, we can both cultivate inclusive cultures in engineering programs and develop emotional resilience within our students.

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