A Phenomenological Inquiry into Engineers' Motivation to Follow

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A phenomenological study of engineers' motivation to follow was conducted. Creating a mirror image of a phenomenological investigation into why some engineers choose to become managers (Ulrich, 2017), the present investigation was intended to unearth insight related to why some senior engineers, who are qualified to act as engineering managers, prefer to remain in non-management roles. The study was based upon a set of six semi-structured, 30-minute interviews guided by an eight-question interview guide derived from the literature. The participants, all of whom work at the same high technology medical device manufacturer in Southern California, were senior engineers who prefer to remain in non-managerial engineering roles. Each interview was transcribed and first-cycle-coded immediately following the interview. Saturation was recognized following the fifth interview, but a sixth interview was conducted as confirmation. Using *in vivo* and *pattern* coding (Saldaña, 2016), a total of 30 themes were identified. Overall the results suggest that these engineers prefer non-managerial roles because, in their context of high technology medical devices, the same factors that drive some engineers to become managers motivate these engineers to continue in non-managerial roles. In other words, these engineers perceive their non-managerial roles as the optimum expression of their character, organizational commitment, and common sense. In addition to providing a new understanding of these engineers' motivation to follow, a new six-fold paradigm (doing, knowing, teaching, mentoring, relating, modelling) of engineering is proposed. Finally, three insights into retaining top engineering talent are provided.

As noted by Clemmons and Fields (2011), the research on motivation to lead began with Chan and Drasgow (2001). Since that seminal work, several quantitative studies (e.g. Cho, Harrist, Steele, & Murn, 2015; Guillén, Mayo, & Korotov, 2015; Stiehl, Felfe, Elprana, & Gatzka, 2015; Rosch, Collier, & Zehr, 2014; and Mascia, Dello Russo, & Morandi, 2014) have added to our understanding of motivation to lead. Quite recently, Ulrich (working paper) completed a qualitative inquiry which added to the previously

quantitative-only motivation to lead research stream. However, the emerging body of research on followership has not yet been integrated into the study of motivation to lead. This is a particularly noticeable gap in the literature in light of Crossman and Crossman's (2011) observation that the concepts of leadership and followership have significant overlap to the point that some treat the words leadership and followership as synonyms. Furthermore, as Stech (2008) observed, in the post-industrial era, leadership in groups of knowledge workers constantly shifts among members of a workgroup, depending upon several factors, including specific expertise. This is to say that knowledge workers, such as engineers, provide leadership in the workplace even when they are not in managerial roles. This observation begs a simple question regarding motivation to lead: how do non-managerial engineers experience and express their motivation to lead? Is it that they are not managers because they do not experience a motivation to lead? Or is it that they experience a motivation to lead which is best expressed as technical experts who exert Raven and French's (1958) personal power bases (referent, expert) without their positional power bases (coercive, legitimate, reward)?

Accordingly, the present research was designed to understand the lived experience of non-management engineers whose technical expertise defines them as leaders despite their non-managerial status. This report is arranged in five sections. The first section consists of a literature review which (a) provides a definition of the concept of followership, (b) summarizes the relevant empirical research on followership, (c) summarizes the relevant empirical research on motivation to lead, and (d) enumerates the interview questions which naturally flow from the literature. The second section describes the research methodology used, including brief descriptions of the phenomenological method, the research sample, the interview, the demographic information gathered, the human subject review board process, the informed consent statement, and the method of analysis. The third section presents the results along with the themes and sample statements from the interviews. The fourth section provides a discussion of the results, including new insights into these engineers' motivation to follow, a proposed new paradigm of engineering, and three insights related to retention of top engineering talent.

Literature Review

The review of the literature is organized in three parts. First, a definition of followership is provided. Second, the empirical research on followership is reviewed. Third, the empirical research on motivation to lead is reviewed. The review of the motivation to lead literature includes enumeration of the interview questions to make explicit the link between the research and the interview questions.

What is followership?

The term followership describes the role played by subordinates in the leadership process, and relates to both the nature and magnitude of the influence the subordinates exert on the leader (Uhl-Bien, Riggio, Lowe, & Carsten, 2014) and various leadership outcomes. In fact, Uhl-Bien et al. go as far as asserting that followership is an important, even critical, aspect of leadership. Furthermore, Riggio (2014) argues that studying followership is important for several reasons, including the simple fact that academics have tended to focus almost exclusively on the leader even though the leadership process clearly involves followers as much as leaders. In practical terms, the study of followership is especially concerned with what constitutes ideal followers, and how all followers are best encouraged to become the most effective and impactful followers they can be.

What is known about followership?

The articles selected for review can be arranged into two major categories: (a) articles which deal with the nature of followers and followership, and (b) articles which deal with the interaction of followership and leadership. As such, the first category of articles answers the question: how are we to understand the nature of followership and followers? In contrast, the second category of articles answers the question: how does followership impact our understanding of leadership and various outcomes traditionally ascribed to leadership? Having articulated the intent of the article categorization, it must be admitted that some of the articles address both issues and for the purposes of the present work, are arbitrarily assigned to a single category.

The Nature of Followership and Followers

The reviewed empirical articles related to the nature of followership and followers roughly fall into three categories. The first four articles address implicit followership theories. The next two articles describe followership continuums for classifying types of followers. Finally, the last two articles relate to how follower relationships interact with expressions of followership.

Implicit followership theories. According to Aronson, Wilson, and Akert (2005), when people have inadequate amounts of information in social situations, they subconsciously tend to use schema, or mental shortcuts, to backfill the missing information based on previous observations. In the context of followership, such schemas are referred to as implicit followership theories. As such, these implicit followership theories both (a) allow us to simplify how we think about followership and (b) represent a summary of all we believe about followership (Sy, 2010). For this reason, there is tremendous value in identifying these implicit beliefs to help

understand both followers' behavior towards leaders and leaders' behavior toward followers.

Toward that end, Sy (2010) conducted an extensive quantitative study of implicit followership theories involving five different studies and over 1,300 participants in the United States. In the first four studies, Sy used factor analysis to identify three prototypes of followership ("industry, enthusiasm, good citizen", p. 73) and three anti-prototypes ("conformity, insubordination, incompetence", p. 73). Importantly, his anti-prototypes were not just opposites of the prototypes, but clearly different constructs. In his fifth study, Sy found not only that his prototypes correlate positively with followership, but also with (a) the follower's liking of the leader, (b) the leader's liking of the follower, (c) the follower's trust of the leader, and (d) the follower's job satisfaction. Likewise, Sy found that his anti-prototypes correlated negatively with only three of the same factors, namely: (a) the follower's liking of the leader, (b) the follower's trust of the leader, and (c) the follower's job satisfaction.

Using a different approach in a different culture, Mohamadzadeh, Mortazavi, Lagzian, and Rahimnia (2015) executed a phenomenological investigation of implicit followership theories by conducting semi-structured interviews with 14 employees in 12 (six public, six private) large organizations in the second largest city in Iran. As did Sy's (2010) quantitative analysis, Mohamadzadeh et al.'s analysis (2015) demonstrated evidence of both prototypes and anti-prototypes. However, Mohamadzadeh et al. found five prototypes ("constructive perception of work, job competencies, mighty arm of leader, moral virtues, and initiation pattern," p. 397) and five anti-prototypes ("role deviance, obedience, incompetency, indifference, and blue color [sic]," p. 397). Furthermore, Mohamadzadeh et al.'s prototypes and anti-prototypes are not as independent as are Sy's (2010). For example, there appears to be negative similarity between Mohamadzadeh et al.'s (2015) prototype of job competencies and Mohamadzadeh et al.'s anti-prototype of incompetency. Nonetheless, the research by Mohamadzadeh et al. appear rigorous and suggests that followership prototypes can vary across culture.

In a slightly more theoretical approach to implicit followership theory, Junker, Stegmann, Braun, and Van Dick (2016) conducted a quantitative study designed to create an instrument for measuring implicit followership theories. One of the major differences underlying Junker et al. and the previous works is that Junker et al. based their work on the theoretical work by Junker and van Dick (2014) who proposed that implicit followership theories have two dimensions: (a) "norm of prototype" (p. 1155), which indicates if the prototype reflects typical or ideal followership, and (b) "valence of prototype" (p. 1155), which indicates if a prototype is positive or negative (prototype or anti-prototype). Over four separate studies involving 807 German participants, Junker et al. (2016) successfully designed an instrument which they validated by showing that when their scale is used to measure ideal followership, it correlated as

expected with (a) Sy's (2010) implicit followership theory scale, (b) organizational citizenship behavior, (c) follower performance, and (d) leader-member exchange. By developing an instrument which can assess both ideal and actual implicit followership theories, Junker et al. (2016) provided a tool to help practitioners diagnose problems between leaders and followers in real organizations.

Focusing on how leaders react to proactive followers, Benson, Hardy, and Eys (2016) conducted semi-structured interviews of full-time professional coaches of successful Canadian collegiate sports teams. In their subsequent qualitative analysis, Benson et al. identified four desirable characteristics of proactive followers: "a collective orientation" (p. 954), "active independent thought in the context of team values" (p. 955), "relational transparency" (p. 955), and "an ability to process self-related information accurately" (p. 956). Additionally, Benson et al. identified five contextual factors related to proactive followers: "presence of third-party observers" (p. 957), "performance versus learning contexts" (p. 958), "stage in the decision-making process" (p. 958), "suitability of the targeted issue" (p. 958), and "relational dynamics" (p. 958).

Followership continuums. Rather than focus on the components of followership, as do implicit followership theories, Carsten, Uhl-Bien, West, Patera, and McGregor (2010) conducted a qualitative study in which they attempted to identify categories of followers. By conducting semi-structured interviews with 31 individuals selected from a wide range of industries and hierarchical positions, Carsten et al. identified a continuum consisting of "passive, active and proactive followers" (p. 550). In their continuum, passive followers behave as the traditional sheep model, active followers engage when prompted to, and proactive followers engage on their own initiative. Interestingly, Carsten et al. found that about one-third of their participants conceptualized followers as passive, one-third as active, and one-third as proactive.

In a study, similar to Carsten et al. (2010), Gilstrap and Morris (2015) performed a qualitative study in which they conducted semi-structured interviews with 35 leaders in various nonprofit organizations across the United States. Their analysis produced a continuum of "uninvested follower, invested follower, and leadership preparation follower" (Gilstrap & Morris, 2015, p. 166). Interestingly, in the Gilstrap and Morris' model, the most desirable followers (leadership preparation follower) are those headed for leadership. In other words, it appears that the Gilstrap and Morris model includes an inherent assumption that being a leader is more desirable than being a follower. Additionally, Gilstrap and Morris found evidence that a fluid movement between a follower and being a leader naturally occurs in nonprofit organizations. Unfortunately, Gilstrap and Morris do not attempt to reconcile their view that excellent followership is a stop along the way to becoming a leader with their view that leaders continually move between leadership and followership behaviors.

Follower relationships. Recently, Steffens, Haslam, Jetten, and Mols (2016) introduced the notion of ingroup and outgroup to the followership research. In the first of two mixed methods studies, Steffens et al. used Amazon's Mechanical Turk to obtain 449 usable surveys from the general American population. By including Sy's (2010) instrument for measuring implicit followership theory and by asking open-ended (qualitative) questions to gather participants' descriptions of (a) groups they identify with and (b) followers of rival groups, Steffens et al. (2016) concluded that group members tend to hold a positive view of followers in their ingroup and a negative view of followers in the outgroup. Furthermore, Steffans et al. found that group members advocate leaders using persuasive methods with the ingroup, but coercive methods with the outgroup. In a second study of equal numbers of Republicans and Democrats (roughly 260 of each), Steffens et al. confirmed their findings from the first study by showing that members of each party viewed members of their own party according to Sy's (2010) prototypes while viewing members of the opposite party according to Sy's anti-prototypes. Additionally, Steffens et al. (2016) found that members of each party advocate their leadership using persuasive methods within their own party but coercive methods with the opposing party.

Conducting a study they describe as an extension to Carsten et al. (2010), Billot et al. (2013) recruited 38 instructors from various academic fields in North America, Europe and Australasia. For the study, each participant wrote a short description of their experience as a follower in the education system. By using narrative analysis, Billot et al. found that the positive responses, which were roughly half of the narratives, portrayed a dynamic interaction wherein leaders and followers worked together to create optimum relationships and role assignments. Furthermore, by considering all responses, Billot et al. proposed the concept of relational space where leaders and followers may jointly construct either positive relational spaces, which promote a generally uplifting and meaningful experience or negative relational spaces which suppress followers and inhibit productivity. As an interesting aside, Billot et al. noted that several academics they invited to participate in the study declined because they believed they only lead and never follow.

Summary: The nature of followership. Taken together, the reviewed articles suggest five ideas related to the nature of followership. First, prototypes and anti-prototypes of implicit followership theories exist and can be identified. Second, although such prototypes and anti-prototypes exist, they may vary across culture. Third, prototypes may be thought of as having two dimensions: norm (ideal/actual) and valence (prototype/anti-prototype). Fourth, types of followers naturally fall into three categories, although there is some discussion as to which three categories. Fifth, follower relationships, both between followers in different groups (ingroup/outgroup) as well as follower relationships with leaders, profoundly affect the expression of followership.

From these five ideas related to followership, two ideas pertinent to the current study emerge. First, this review of the followership literature establishes the notion that we think differently about followership and leadership. But what about when leadership moves among the group, as is the case of knowledge workers in general, and engineers in specific? In that case, the distinction between manager and leader is quite evident. The role of manager continues to reside with the one formal manager, while the role of leader passes around the workgroup. In a context where the delineation between manager and leader is evident, it is argued that motivations to lead may move engineers away from managerial roles and toward non-managerial roles, because it is these non-managerial engineers who provide the majority of leadership in high tech environments.

Second, because the notion that a complex relationship exists between leaders and followers, it is argued that in workgroups of knowledge workers, where the leadership role moves around freely, there may be additional relationship interactions which impinge upon felt motivation to lead. In other words, the complex relationships may also move engineers away from managerial roles toward non-managerial roles.

What is known about motivation to lead?

In the seminal quantitative work on motivation to lead, Chan and Drasgow (2001) initially conceived of five major antecedents of motivation to lead: (a) personality, (b) values, (c) general mental ability, (d) leadership self-efficacy, and (e) past leadership experience. Furthermore, Chan and Drasgow measured five components of personality using the so-called big five personality factors ("extraversion, agreeableness, conscientiousness, openness to experience, and emotional stability," p. 483) and Triandis and Gelfand's (1998) four components of values ("horizontal collectivism, horizontal individualism, vertical collectivism, vertical individualism," p. 118). By conducting three separate studies using (a) 1,594 Singaporean soldiers, (b) 274 Singaporean community college students, and (c) 293 undergraduate students from a major American university, Chan and Drasgow (2001) identified three factors of motivation to lead. The first factor, "affective/identity motivation to lead (AI-MTL)" (Chan & Drasgow, 2001, p. 492) describes a combination of wanting to lead and seeing oneself as a leader. The second factor, "social-normative motivation to lead (SN-MTL)" (Chan & Drasgow, 2001, p. 492) describes a felt obligation, either social or moral, to lead despite personal preferences. Their third factor, "non-calculative motivation to lead (NC-MTL)" (Chan & Drasgow, 2001, p. 492) describes felt motivations which flow from ideals which transcend transactional reward. For the purposes of the present study, the work of Chan and Drasgow suggests three groups of interview questions:

> Interview Questions, Group 1: Do you see yourself as an influencer of people at work? Do you enjoy influencing people at work? How do you influence people at work?

Interview Questions, Group 2: Do you feel any sense of obligation, either moral or social, to influence people at work? Do you influence people at work because you want to or because you have to?

Interview Questions, Group 3: Do you have a sense of doing the right thing when you think about choosing to remain in a non-managerial role? What about the inverse? Do you have a sense of selfishness when you think about choosing to remain in a non-managerial role? Is having you in a non-managerial role better or worse for the company? Is having you in a non-managerial role better or worse for yourself?

Recently, Ulrich (working paper) conducted qualitative interviews of six engineering managers recently promoted into management. Using "in-vivo coding" (Saldaña, 2016, p. 105) followed by "pattern coding" (Saldaña, 2016, p. 235), Ulrich (working paper) identified a fourth component of motivation to lead, "desire to teach and mentor" (p. 93). This fourth motivation to lead describes a desire to assume leadership roles as a means of fulfilling a desire to teach and mentor younger engineers. For the purposes of the present study, the findings in Ulrich suggest one additional group of interview questions:

Interview Questions, Group 4: Do you regularly teach or mentor others at work? Can you think of specific instances where a desire to teach and/or mentor affects how you influence people at work? Have you mentored anyone at work? Do you hope to mentor someone at work?

In their study of 231 students at the United States Air Force's Air War College and Noncommissioned Officer Academy, Clemmons and Fields (2011) conducted a quantitative study in which they measured both Chan and Drasgow's (2001) three motivations to lead and two types of values. The first type of value, which Clemmons and Fields (2011) called "self-enhancement value orientation" (p. 587), was operationalized as desire for power and achievement. The second type of value, which Clemmons and Fields called "self-transcendence" (p. 587), was operationalized as tendency toward spirituality, integrity, and servanthood. Their analysis showed no correlation with social-normative motivation to lead, strong correlation between self-enhancement value orientation and affective-identity motivation to lead, and some correlation between self-transcendence and non-calculative motivation to lead. It is worth noting that Clemmons and Fields also proposed future research looking at motivation to follow. However, their proposal did not include the distinction in the present study regarding managerial and non-managerial leadership. Nonetheless, their study does imply the need for a question regarding desire for power and achievement in the present study:

Interview Questions, Group 5: Does a desire for either power or achievement impact your decision to remain in a non-managerial role?

In their quantitative study of 231 American undergraduate students at a large Midwestern university, Cho et al. (2015) measured the relationship between Chan and Drasgow's (2001) motivation to lead and basic needs satisfaction (e.g., Deci & Ryan, 2000). In doing so, Cho et al. (2015) found that both a need for competence and a need for relationships correlated with motivation to lead. Hence, their study implies the need for two more sets of questions for the present study:

Interview Questions, Group 6: You are very good at engineering; that is why you are considered a senior engineer. How has the knowledge that you are a good engineer affected your decision to remain in a non-managerial role?

Interview Questions, Group 7: How do your relationships with other engineers impact your decision to remain in a non-managerial role? Do you believe that becoming a manager would change those relationships? If so, how would those relationships change?

In another quantitative study, Guillén et al. (2015) surveyed 260 European MBA students to assess how affective-identity motivation to lead is influenced by role models. They found that role models strongly influence motivation to lead, especially when a personal relationship exists with the role model. Accordingly, their research suggests another set of questions for the present study.

Interview Questions, Group 8: Has your preference to remain in a non-managerial role been influenced either positively or negatively by a role model(s)? If so, please talk about the role model(s) and how they influenced you. What was the role of this role model? Was he/she in the same department? At the same level?

Methodology

This section describes the research methodology. This description proceeds in five steps. First, a brief overview of the phenomenological method is provided. Second, the research sample is described along with a clear statement of the inclusion criteria. Third, details of the interview process are provided. Fourth, the gathered demographic data are described along with their justification from the literature. And fifth, the analysis method is described in detail.

Phenomenological Inquiry

The overall research framework used in the proposed study is transcendental phenomenology as defined by Moustakas (1994). Following the advice of Patton (2015),

care was taken to avoid blending different varieties of phenomenology. The salient aspects of transcendental phenomenology are its emphases on (a) attempting to discover the essence of a phenomenon, in this case, an engineer's motivation to follow, (b) attempting to discover the "lived experiences" (Moustakas, 1994, p. 38) of the participants, (c) making "systematic efforts to set aside prejudgments" (Moustakas, 1994, p. 23), (d) engaging both the researcher's intuition and imagination, and (e) grounding of the approach in the philosophical system of Edmund Husserl. As such, this research asks: What is the lived experience, specifically regarding their motivation to follow, of senior engineers who have chosen to remain in non-managerial roles?

Research Sample

The research sample consisted of senior engineers who (a) have earned degrees in either electrical engineering, computer engineering, mechanical engineering, biomedical engineering, software engineering, or computer science, (b) have at least ten years of professional experience working as engineers, (c) are not currently employed in formal managerial roles, and (d) indicated they prefer an engineering role as an individual contributor over a role as an engineering manager. Prior to the study, the researcher anticipated difficulty identifying suitable participants, and accordingly a snowball sampling technique was proposed to identify candidates unknown to the researcher. However, the researcher was able to recruit the required number of qualified participants without contacting the suggested snowball candidates. Each interview was transcribed and first-cycle-coded immediately following the interview. The researcher identified saturation following the fifth interview, but conducted a sixth interview as confirmation.

The Interviews

The interviews were conducted after obtaining approval from the Regent University Human Subject Review Board. The interviews were semi-structured, meaning that although the researcher had an interview guide available during the interview, there was no requirement to carefully follow the guide. However, because the guide contained the questions identified above in the literature review, the researcher referred to the guide during the interview. As expected, none of the interviews lasted more than 30 minutes. Each of the interviews was recorded using a digital audio recorder.

Prior to asking the first question in the interview guide, the interviewer reviewed the inclusion criteria with the participant. Each participant indicated he met the inclusion criteria. However, during one of the interviews, it became clear that the participant truly desired to be a manager, and therefore did not meet the inclusion criteria. His interview was, therefore, not included in the present study. In total, seven interviews were conducted but one was discarded.

Demographic Data

The relevant demographic data, along with their justifications from the literature, are identified in Table 1. These basic demographic data were collected at the conclusion of the interviews per the advice of Babbie (2013).

Method of Analysis

The analysis proceeded in steps. First, the digital recordings were manually transcribed by the researcher into separate Microsoft Word files, one for each interview. Second, the texts of the transcriptions were lightly edited to remove nervous stuttering and words such as *um*. Third, the researcher performed first cycle coding using "in vivo codes" as described by Saldaña (2016, p. 105). Fourth, all coded text was imported into a single Microsoft Excel file such that the text and the in vivo codes appeared in columns A and B, respectively. Finally, Excel's sorting features were used to facilitate creation of second cycle "pattern coding" (Saldaña, 2016, p. 235) column C. During the creation of the second cycle codes, some of the in vivo codes were edited such that long codes were shortened and nearly identical codes were combined to reduce the total number of unique in vivo codes. Finally, the pattern codes were grouped into 30 unique themes in column D. However, the themes were identified initially by question group. For example, four themes were associated with the first group of questions. In total, progressing question by question produced 26 themes. Interestingly, four groups of pattern codes did not naturally divide by interview question group. Accordingly, these four groups of pattern codes were associated with four themes not aligned with any one question.

Table 1. Proposed Demographic Data

ID	Data Item	Precedent
1	Age	Guillén et al. (2015)
2	Gender	Rosch et al. (2015)
3	Total years of professional engineering experience	Guillén et al. (2015)
4	Total years as engineering manager	Guillén et al. (2015)
5	Undergraduate major	Riley, Cudney, and Long (2013)
6	Advanced degrees earned	Riley at al. (2013)

Results

This section describes the results of the research. First, a top-level profile of each participant is provided. Next, 26 of the themes are presented as organized by interview question group. Finally, four of the themes, which aligned with none of the interview question groups, are presented as emergent themes.

Participant Profiles

All six of the participants earned an undergraduate degree in either computer science or engineering, and none of them earned a graduate degree. Furthermore, all six of the participants are employed at the same medical device manufacturer in Southern California, four of them as regular employees and two as contractors. Five of the participants have lived their entire lives in the United States and the sixth was born and raised in Europe. The other demographics of the participants are provided in Table 2. In Table 2, pseudonyms are assigned to each participant such that the first letter of each pseudonym is alphabetized by order of the interview. In other words, the name Ayden was assigned to the first participant, the name Benjamin was assigned to the second participant, and so on.

Table 2

Participant Demographic Summary

Pseudonym	Code	Gender	Age Range	Experience as Engineer	Experience as Manager
Ayden	A	M	30-39	14 years	4 months
Benjamin	B	M	30-39	20 years	None
Colin	C	M	40-49	27 years	8 years
Dontrel	D	M	60-69	40 years	1 year
Easton	E	M	50-59	28 years	2 years
Fabrizio	F	M	40-49	21 years	3 years

Question Group 1: Feelings and Identity

The first group of questions was designed to explore affective and identity issues related to these engineers' preference to remain in non-managerial roles, and the analysis of the responses revealed four themes. The first theme, engineers influence via their knowledge and skill, reflects comments from five of the engineers. Benjamin said, "I try to help guide them" and Dontrel said "I think that because of my experience I

might know good ways to do things, or good ways to design things, and architect things." Easton had a similar comment, "I like being kinda the higher level of engineering so I know quite a bit. And so, I can help junior engineers struggle through not only mechanical stuff."

The second theme, which reflects comments from three engineers, is that engineers can influence an organization by helping their coworkers. Ayden said "my definition would be influencing people at work would mean helping them most of the time. That's how I try to influence people." Easton expressed a similar view, "I know I help, I influence people." Fabrizio said working together was more important than merely managing, "I see that more as collaborating, I guess, rather than managing someone." As such, these engineers describe influence as neither leading nor managing, but simply helping one another.

The third theme was that these engineers saw similarities between their work as engineers and the work of managers. Benjamin, Colin, and Fabrizio talked about the similarities, with Benjamin noting that the two concepts are not exclusive, "Just because I'm not a manager doesn't mean I'm not a leader," and that, "a lot of my titles have been like project engineer, and it's an interesting title because if you think about the projects you work on, you're not just doing engineering." Likewise, Colin spoke of manager-like experiences as an engineer, "Here I am coming in here for a couple of weeks, and I gotta get this ship turned around." As such, these engineers report both leading and managing in roles they consider as non-management roles.

The fourth theme is that sometimes exerting influence is stressful. Colin said, "It was very stressful, trying to convince people this was the right direction to go because everyone has their own ideas of the way to do things." Colin also talked about difficulties with people, "And some of the people were like 'yeah, that sounds great' and other people were just looking at me like 'I hate you.'" Dontrel noted that attempts to influence are not always taken well, "And it happens a lot. And it's not always taken well." Together, these four themes suggest these engineers view their knowledge and willingness to help one another as their primary mode of influence, while admitting that sometimes influencing is difficult, and sometimes influencing resembles managing.

Question Group 2: Sense of Obligation

The second group of questions was designed to explore if these engineers felt any sense of either moral or social obligation to influence the organization, and during the analysis, three themes emerged. The first theme, a felt obligation, emerged from responses from each of the six participants. However, the six participants split evenly on the two sub-themes with Ayden, Benjamin, and Easton claiming to feel no obligation to influence while Colin, Dontrel, and Fabrizio spoke instead of an obligation as engineers. Easton's response was most extreme, saying both "I don't think I'm

obligated" and "it doesn't bother me not to help." In contrast, Ayden was less extreme, suggesting that rather than feeling a sense of obligation, he had "more a sense of that is how I want to behave." In contrast, Colin spoke of an engineer's obligation for "doing high quality work" while Dontrel spoke of an engineer's obligation to "speak up." Taken together, the responses suggest that these engineers do acknowledge they have obligations as engineers, but none which bind them to influence the organization and the individuals within the organization.

The second theme, which emerged in response to the second group of questions, suggested that it would be improper to set a goal of influencing the organization for the sake of having influence. The eight responses coded to this theme came from Ayden, Benjamin, and Dontrel, and all three were clearly uncomfortable with the notion of deliberate attempts to influence. Ayden said, "I try not to enforce my will," while Dontrel said, "I'm not the type of person that wants to influence somebody for its own sake," thus both seemed to feel that intentionally influencing does not match their personality. In contrast, Benjamin seemed opposed to any intention to influence, "I think by doing that, you're kind of … I don't know … it's just not natural." Together, these responses suggest a preference for an organic approach in which influence naturally occurs and is neither forced nor planned.

In contrast to a sense of an obligation to influence, the third theme was that a desire for success is a more proper motivation than obligation. Dontrel spoke of influencing because he wants to succeed, "I don't want to be on a project that fails." Easton talked about the importance of team goals over individual goals, "Not just his stuff, but stuff done for the company. That's very important." Taken together, these ideas suggest that these engineers feel no obligation to influence, and even feel that a desire to influence is wrong; however, they do feel an obligation as engineers and are motivated by a desire to succeed.

Question Group 3: Sense of Idealism

The third group of questions was designed to learn about any sense of idealism driving the participants' decision to remain as non-managers, and three themes emerged from the analysis. As the first theme, all six of the engineers said they enjoy their roles as engineers, noting that they enjoy engineering, they enjoy collaborating with other engineers, and that as such, engineering was the ideal role for them. Fabrizio said it plainly, "I love collaborating and I enjoy being technical." Dontrel explained, "I enjoy knowing, doing the discovery, learning, making, and hands on," and Ayden expressed a similar sentiment, "I feel more fulfilled if I work on something and it works, and it's great." When asked about the best role for him at an ideal company, Colin said "I've always felt that my role is best as kinda as an architect, setting the tone for how software is developed." Likewise, Ayden said, "You feel like 'I'm really good, why

would I? Why would I move to a different role?'" Dontrel said simply that remaining as an engineer "makes sense to me."

As a second theme, these engineers spoke of bad experiences in brief stints as managers. For Ayden and Fabrizio, these bad experiences caused them to view engineering as the ideal role for them. Ayden reported that he "did that for a couple of months and this wasn't as fun as actually doing the engineering, the real engineering work" and according to Fabrizio, "I became the manager and I lost all contact with, all interaction with, the technical stuff I love doing." Similarly, both Benjamin and Colin noted that a manager's experience is at the mercy of the team they lead. Colin said, "I think my enjoyment of being a manager would be largely dictated by the team that I'm going to inherit." As such, these engineers view their engineering roles as ways to avoid unpleasant experiences.

Finally, a third theme was that Ayden, Benjamin, and Dontrel each admitted that, at times, they question whether avoiding management was the best move for them. Benjamin said, "I do sometimes wonder about that, and that's because as I get older, <pause> do companies question why haven't you progressed to a manager?" Interestingly, after describing several reasons he did not want to be a manager, Ayden said, "If it's bad for the company, I would actually try the new position out." In summary, these engineers responded to the third group of questions by (a) affirming they enjoy engineering, (b) questioning whether they would enjoy management, and (c) admitting some doubt that choosing engineering over management is the best decision.

Question Group 4: Teaching/Mentoring

The fourth group of questions was designed to explore how a desire to teach and/or mentor might influence these engineers' desire to follow. The analysis of the responses revealed five themes. The first theme was that all six engineers described teaching as a way to exert influence on the organization. Colin gave an example of a conversation he might have with a younger engineer, "That's a good way to solve it, but here's an alternative way you might solve it maybe a little differently." Benjamin shared a similar idea, "I mean, you've got these young guys and you know, there are a lot of things I can show them."

The second theme is that some engineers act as mentors while others do not. As an engineer who is a mentor, Colin said, "I've mentored lots and lots of people." In contrast, Dontrel said the opposite, "I haven't done this." Interestingly, Ayden and Dontrel, who do not mentor, and Colin, who does mentor, all said that they do not seek mentoring opportunities. Dontrel said "that's not something I'd go seek to do." Similarly, Ayden said "that's not really important to me" while Colin explained his reason for not seeking mentoring opportunities, "I'm an introvert." Hence, some of these engineers viewed themselves as mentors and some did not. Furthermore, some

question both the value of being a mentor and the value of pursuing mentoring opportunities.

The third theme, which was articulated by Ayden, Colin, and Fabrizio, was that engineers make better mentors than managers. For example, Colin contrasted engineers and managers as mentors, "Whereas if I were a manager, I might not be close enough to the code to kinda fully appreciate the nuances and the detail of the design." Fabrizio spoke of the challenge facing a manager who wanted to mentor a young engineer, "As a manager, how I see a manager, I would be removed from that."

The fourth theme, which emerged from comments from four of the six engineers, was that a good mentor is patient. Curiously, even though Ayden and Dontrel each denied being a mentor, they each spoke readily of how mentors ought to be patient. Dontrel said, "the mentors need to be patient" and that, "the environment should be very open to questions, and open to saving time by asking somebody 'how did you do this?'" Likewise, Ayden described how he would mentor, "I see something weird or not right and I try to not blame them." In sum, these engineers described the ideal mentor as one who is patient and willing to answer all questions.

The fifth theme, which incorporated comments from four of the engineers, was that the best mentees are eager to learn, able to learn, and humble enough to learn. In describing someone he enjoyed mentoring, Colin said "he would just suck all the knowledge out of my brain and put it into his." Colin described another young engineer he is mentoring as smart, enthusiastic, and easy to work with. Benjamin's take was that the best mentees understand that, "we're all teaching and learning."

Question Group 5: Achievement and Power

The fifth group of questions was designed to explore how the notions of achievement and power affect these engineers' motivation to follow. As expected, the analysis of the results to these questions broke into two broad categories, achievement and power. Regarding achievement, three sub-themes emerged. First, in reality, engineers achieve more than managers. Ayden articulated this idea, "To achieve, I think I feel that the most impact I can make is as an individual contributor, adding to or developing the product." Colin expressed a similar sentiment, "Achievement I can more readily see being an engineer." Second, the perception is often that managers achieve more than engineers, hence Fabrizio said, "A lot of businesses have that perspective; if you want to achieve, you have to go the manager route instead of the engineering." Benjamin seemed to address the perception issue directly, "Just because you are a manager doesn't mean you can't achieve and have impact." Third, there was considerable disagreement as to what constitutes real achievement. According to Easton, "Well, it's a promotion, I'd assume, maybe higher salary, and responsibility." Ayden had the opposite view "doing stuff … you know, testing and creating stuff. I've always seen

that, oh man, my impact, it's always so huge." Taken together, the data suggest that these engineers are unclear on what constitutes genuine achievement, nonetheless, they consider an engineer's achievement as more substantial than a manager's.

Regarding power, four sub-themes emerged. First, these engineers held a generally negative view of power. For example, Colin said the word power "has somewhat of a negative connotation." Likewise, Easton said "I think a little bit negative when I hear that word." And Dontrel questioned the value of power, "It's not measurable, what do you do with it?" Second, when these engineers viewed power as the ability to accomplish, they felt that they had more power as engineers. For example, Easton said, "I probably have more power as an engineer," and Colin said, "As a single engineer, you do have influence." Third, when these engineers thought of power in terms of the organization, they viewed managers as more powerful. Interestingly, even though he said he had more power to accomplish as an engineer than a manager, Easton also said "definitely someone who is a manager would have more power." Fourth, these engineers said that they were not motivated by a desire for power. For example, Colin said of power, "This is the opposite of what I want." Likewise, when asked about wanting power, Dontrel seemed stunned and said, "It almost doesn't compute in a way." And Benjamin simply said, "I'm definitely not a power person." Together, the analysis suggests that these engineers dislike the notion of power, even though they admit they have power, but in lesser degrees than managers.

Question Group 6: Competence

The sixth group of questions was designed to explore how their engineering competence might impact these engineers' desire to follow. The analysis of these responses revealed three themes. First, Benjamin, Colin, Dontrel and Easton each talked about being better engineers than managers. Dontrel said, "If I were put into a position where I were not able to apply myself as much to engineering, I don't know if I'd be as effective." Colin suggested that "The smartest guy may be better served as being the architect, and not in charge of everything." Benjamin said "I think everyone has their strengths and weaknesses. And, I don't see that [managing] playing into not only my strengths but also what I want to do." For these three engineers, trying to convert a great engineer into a manager made little sense.

The second theme was similar to the first, and concerned criteria for selecting a manager, given that technical competence is not a sufficient criterion. Colin raised the issue of personality, "It depends upon the person's personality and what they want." Fabrizio and Colin both raised the issue of people skills, with Colin speaking of a specific experience, "He has such an obtuse personality, that it's very difficult. So yeah, he may be the smartest guy in the room, but he may piss everyone off." Easton brought up the issue of an engineer simply not wanting to be a manager, "I think I'd have to answer that question in terms of what I like to do, what I enjoy doing." However, these

engineers also affirmed the importance of an engineering manager having some technical skill, "You need to be smart enough to determine if the guy is blowing smoke up his ass." Together, these engineers spoke of technical competence being one of many requirements, which include people skills, appropriate personality, and desire to be a manager.

Third, while answering this set of questions, three of the engineers talked about their own experiences being temporarily recruited into management. As such, they used themselves as an example of good engineers who were not good managers. Ayden spoke of a previous employer who promised they would help him as a manager, but never did. Similarly, Fabrizio spoke of being promoted into a management role he hated. In contrast, Colin spoke of being recruited into management and it being "a pretty good experience," even though he prefers non-management roles. Oddly, Ayden spoke at length about both (a) how much he disliked managing, and (b) how he would be willing to try again if asked.

Question Group 7: Relatedness

The seventh group of questions was designed to explore how these engineers' relationships are related to their motivation to follow, and the analysis identified three themes in the responses. The first theme concerns the impact of becoming a manager on existing relationships, and it is comprised of three different themes: a promotion may change the relationships, a promotion will change the relationships, and a promotion should not change the relationships. Interestingly, three of the engineers who said a promotion should not affect the relationships admitted that it probably would change the relationships. Easton thought a promotion would not alter his relationships, "I don't think that would alter my getting along with everyone." In contrast, Fabrizio was certain it would alter the relationships, "Yes. They would be changed." Colin spoke of a change as a real possibility, "There might be some hard feelings there."

The second theme which emerged is almost the inverse of the first, and had to do with whether existing relationships would impact an engineer's decision to accept a promotion. Benjamin, Easton, and Dontrel each said existing relationships would not hold them back. For example, Benjamin said "I wouldn't let that hold me back." In contrast, Colin and Fabrizio both considered that a factor in the decision. Fabrizio said, "I would definitely let that weigh in" while Colin said, "if you've had a long-standing relationship with these people, that probably plays more and more into the equation."

The third theme, which comes from comments from Ayden, Benjamin, and Dontrel concerned their dislike of authoritarian managers. Although it is surprising that this theme emerged from this set of questions, it makes sense in that a discussion of relationships at work seemed to trigger strong feelings of dislike toward managers with whom they had poor relationships. Ayden spoke particularly about one manager he

worked for, "There's no bargaining with Harvey. You'll not bargain with Harvey. Harvey tells you to do it, and you actually have to do it." Likewise, Dontrel said, "They should know you can't be authoritarian." Taken together, these responses suggest that relationships at work are complex, both affecting and being affected by the promotion of an engineer. Furthermore, for these engineers, the worst relationships are with authoritarian managers.

Question Group 8: Role Models

The eighth group of questions explore the impact of role models on engineers' preference to remain as individual contributors. The analysis revealed three broad categories of role models: engineering role models, management role models, and life role models. Regarding engineering role models, Benjamin and Easton reported having no such role models. Benjamin said, "There has been no particular person," and Easton said, "I can't think of a specific role model." However, the other four were quick to describe how their role models (a) taught them about engineering, (b) taught them the importance of having people skills, and (c) showed them that they did not need to aspire to management. Ayden recounted how his role models taught him technical things by saying things such as, "That's how the solenoid works, and why we drive current to move the solenoid back and forth." Colin and Fabrizio each spoke of role models who showed them the importance of having people skills as an engineer. For example, Colin talked about two role models early in his career, "Both were for the most part pretty reasonable to get along with others." Ayden, Colin and Dontrel each described how a role model showed them they did not need to aspire to management. Speaking of his two role models, Colin said "I could tell that both of them didn't really want to manage." Dontrel said it was his role model that "enlightened me that that is a possibility," to remain in a non-managerial role.

Regarding managerial role models, a single theme emerged: the managers that Ayden, Colin, Dontrel, and Easton viewed as role models were all people-oriented. Ayden spoke at length on this topic. One of Ayden's comments was, "if the manager has that perspective of building, having good relationships and building people up. Because then, ultimately your team is happier," and Ayden also described the benefit of this, "and of course, the side effect is that they are going to work harder for you."

And finally, two of these engineers spoke of role models outside of the work context. Fabrizio cited Telsa CEO, Elon Musk, as an engineering role model despite Musk's obvious managerial status, "I've been really admiring what Elon Musk has accomplished and has done, and I don't see him necessarily as a manager." Taking a different direction, Easton spoke of how his father, a lawyer, made career decisions which allowed him to spend time with his family, "He was always home between 4 and 5; he would work seven hours per day." Clearly role models influenced these engineers profoundly.

Emergent Themes

In addition to the themes which emerged during the analysis of responses to specific questions, four additional themes emerged when the second cycle codes were recoded into themes without regard to the specific question. Presumably, this is because each of these themes incorporates responses from three or more questions. The most dominant emergent theme, which incorporated responses from six different questions, and all six engineers, is that these engineers prefer non-managerial roles. As such, this theme had two sub-themes. First, four of the engineers spoke of a dislike of being a manager. Ayden said, "I don't like doing the other managerial stuff," and Colin described managerial work as, "pushing paper around." Fabrizio spoke of the moment he realized he does not enjoy managing, "Talking to the people who were working for me at the time, all of the other support engineers, and that's when I thought 'I don't enjoy that.'" The second sub-theme was an awareness of the downside of being a manager. Easton spoke of his friend Malcolm who was recently promoted and now unable to do what he loves, "Malcolm is a perfect example. He used to be designing stuff six hours a day every day and now he has about 10 minutes every day." Colin spoke of the increased difficulty of managing, "There is no question; managerial is a little tougher," and Benjamin said, "I think managers probably get called into a lot of meetings." In total, these six engineers said that they dislike managing and they have good reasons to dislike it.

The second emergent theme concerned mentoring, and this theme, which was expressed by all six engineers across four different questions, included three sub-themes beyond those identified in the analysis of responses to specific questions. The first sub-theme was that these engineers enjoyed mentoring. Colin said, "I do enjoy mentoring younger engineers," and, "you feel like you're contributing to the team, to someone's career path." When asked about mentoring, Fabrizio said "I do enjoy doing that" and Easton said, "That is something I consider that I like to do." The second sub-theme, which was articulated by three of the engineers, was that good mentors try to help. In describing one of the engineers who mentored him, Ayden said, "it was the lead embedded guy there and he basically took me under his wing." Dontrel spoke of the importance of a mentor simply being "willing to help out." The third sub-theme, which was articulated by Ayden and Dontrel, was that in some cases, mentoring is essential for career growth. Dontrel said, "I believe a team is made up of people who need to be mentored – that is not a negative thing, they are new," and Ayden felt that without his mentor, he would still be in "about the same place." In sum, these engineers spoke of mentoring with the intent of being genuinely helpful as enjoyable for the mentor and essential for the mentee.

The third emergent theme, which was articulated by Ayden and Colin in response to four of the question groups, had to do with retaining engineers. Specifically, these engineers reported that when promoted to management, some engineers will leave the

company. Furthermore, failure to reward key engineers in individual contributor roles, will also likely motivate them to leave the company. Ayden spoke of leaving a company after five years because he was promoted to manager, "That's what I did, and then I pretty much left the company." Colin spoke of companies which reward excellent engineers as engineers, "They would prefer to be an individual contributor or architect or something like that. You know I think companies that do have a technical track, they can kinda put you maybe at an equivalent pay grade or status or whatever as a manager." Together, the responses suggest that companies can improve engineer retention by providing significant advancement for engineers as individual contributors.

The fourth emergent theme, which came from comments by four different engineers in response to three different questions, was that despite their preference to remain in non-managerial roles, they clearly understood the importance of having competent management. Dontrel said, "I mean, somebody's got to be in charge," and Colin said, "You can't just have a bunch of engineers running amok." Likewise, Benjamin spoke respectfully of managers, "I don't want to discredit what managers do." In total, although these engineers prefer not to be managers, they clearly recognize the importance of having good managers.

Discussion

While pondering the themes which were identified during the analysis, three significant ideas emerged. First, and perhaps most importantly, nothing in the data suggested that these engineers chose engineering over management because of either lesser character, lesser commitment to the organization, or lesser desire to influence the organization. Instead, the results suggest that these engineers chose to remain in non-managerial roles as expressions of their strong character, their strong commitment to the organization and their desire to play key roles within the organization through their technological influence. In other words, in their context of a high technology medical device manufacturer, these engineers find their roles as individual contributors to be the best expression of factors which, in other contexts, may have driven them to pursue managerial options. Specifically, regarding character, in response to question group one, these engineers spoke of both selflessly helping the team and continuing to influence them even when exerting that influence became stressful. Furthermore, in response to question group five, these engineers spoke of a dislike of a selfish pursuit of power, instead preferring higher ideals. Regarding commitment, in response to question group two, these engineers spoke of great commitment as engineers, and in response to question group six, these engineers spoke of accepting managerial roles when the situation made it necessary. As such, the data suggest that their choice to remain in non-managerial roles best aligns with high character, high commitment, and common sense.

Second, these results suggest a new paradigm for viewing the role of engineers. Specifically, instead of viewing engineers as having the single mandate of doing the work, the present results suggest a six-fold mandate for engineers: doing, knowing, teaching, mentoring, relating, and modelling. In this paradigm, engineers must (a) do the work of an engineer, (b) continually expand their knowledge, (c) influence the organization through teaching, (d) influence individuals through mentoring, (e) contribute to the team through healthy relationship, and (f) model the role of and joy in being an engineer. This paradigm may be useful for helping (a) corporations articulate appropriate expectations for their engineers, and (b) universities train future engineers.

Third, the results from the present study suggest three implications for organizations interested in retaining their top engineering talent. First, when attempting to fill an engineering management role by promoting an engineer, these results affirm the need for the candidate to possess strong engineering skills. However, the results also suggest that both people skills and a desire to become a manager must also be considered. Second, these results suggest that a promotion to engineering manager significantly alters an engineer's relationships; therefore, it is essential for senior managers to help the newly promoted manager establish a new relationship support structure. Third, when promoted, some senior engineers will choose to leave the company. Therefore, engineers who are viewed as critical to the organization's success should be offered advancement along non-managerial paths which allow them to thrive and be rewarded as engineers who exert significant influence upon the organization and who are as committed to the organization as the managers within the organization.

The results from the present study suggest at least two quantitative studies. First, the findings regarding the character and commitment of these senior engineers despite their non-engineering status could be quantitatively verified by comparing measurements of Kelley's (2008) two dimensions of followership (engagement, critical thinking) for engineers and non-engineers. Second, the finding related to promotions and turnover could be quantitatively verified by correlating measurements of turnover intention with promotion records.

Conclusion

Research was conducted with the intent of describing the lived experience of non-management engineers whose technical expertise defines them as leaders despite their non-managerial status. Following a literature review and an explanation of the qualitative methodology, the results of the research were presented, revealing a total of 30 themes. These 30 themes were then reduced into three insights. First, a new understanding emerged that these engineers were motivated to remain in their non-managerial roles by the same factors which, in other contexts, motivate other engineers to aspire to management. Second, a new, six-fold paradigm of engineering was proposed: doing, knowing, teaching, mentoring, relating, and modelling. And finally,

three insights into retaining top engineering talent emerged. Furthermore, suggestions for follow-on quantitative research to verifying these findings were proposed. In summary, this research (a) contributed to understanding both followership and engineers, and (b) provided insight and practical guidelines for practitioners.

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