Enterprise System Implementation: Personality, System-Related Advice Networks and Job Performance

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ENTERPRISE SYSTEM IMPLEMENTATION: PERSONALITY, SYSTEM-RELATED ADVICE NETWORKS, AND JOB PERFORMANCE

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ABSTRACT

This paper investigates the role of personality and system-related advice networks in influencing employee job performance in the context of enterprise system implementations. A field study of 87 employees in a large multinational telecommunications firm provided evidence that the big five personality traits influence centrality and density in the advice networks related to the newly-implemented enterprise system, which in turn influenced employee job performance. As hypothesized, employees’ system-related advice networks were predicted by big five personality characteristics. In turn, system-related advice network centrality and density positively influenced job performance. Interestingly, we found that the system-related advice networks only partially mediated the role of personality on job performance. Scientific and practical contributions and implications are discussed.

Keywords: Enterprise system implementation, job performance, personality, social networks
Social and Behavioral Aspects of Information Systems

Introduction

Understanding employee job performance is an important issue for researchers and practitioners. Insights into the mechanisms that drive employee performance is especially important given that organizational performance as a whole hinges on employee performance. Employees in today’s work environments are often more interdependent than in the past, frequently needing a great deal of coordination with others’ work tasks, dependent upon preceding tasks completed by others, or significant work done in parallel, with the overall quality of work being determined by many employees (Brown and Eisenhardt 1997). As well as being interdependent, individuals often face knowledge and competency challenges. Borgatti and Cross (2003) found that individuals lacking knowledge or competency in a situation, use close others’ knowledge as transactive memory systems to supplement the lack. This is especially important in the case of an enterprise system (ES) implementation. A new ES is often implemented with the goal of improving employees’ job performance, and is also one of the most common triggers for organizational change (Robey et al. 2002). However, even a successful new ES will frequently depress productivity in periods of transition due to disruptions in business processes, jobs, and patterns of flow of information and work (Davenport 2005; Edmondson et al. 2001). Uncertainty is introduced into the work environment with the implementation of an ES due to the realigned business processes and work unit interdependencies, new work and information flows, and even altered job tasks (Kolodny et al. 1996; Robey et al. 2002). This uncertainty, along with the structural realignments which new ES implementations facilitate, create a need for new information with regard to the new systems. These new information needs will drive the employees to alter their informal advice networks to meet these needs. Thus, new sources of information relevant to the new system will be increasingly relied on by the employees. Given this backdrop, ties to others in one’s social networks play a critical role in employee workplace performance.

The majority of social science explanations are grounded in attributes of actors involved with the phenomena being studied (Wellman 1988). The traditional view on technology implementation and its relationship with employee performance has relied on the attributes of individuals, groups, technologies, and organizational contexts for explanatory power. This traditional view often includes variables intended to tap into the idea of social influence and other processes that are often associated with the concept of social structure. Although they are intended to tap into social influence and structure, these variables (e.g., cohesiveness) could more appropriately be considered as proxies for structure, rather than actual structure (Mayhew 1981). We attempt to bypass such often used proxies, to examine actual structures in order to better understand our phenomenon of interest, namely employee job performance following an ES implementation. Specifically, we will examine how employee advice network structures are influenced by personality, and how they then influence job performance.

Much organizational research has focused on the antecedents of, fostering conditions for, threats to, and outcomes of job performance (e.g., Christian et al. 2006; Kuncel et al. 2004; Schmidt and Hunter 2004). One area that has been prolific is that of personality traits as predictors of job performance (Hurtz and Donovan 2000; Salgado 2003; Tett and Burnett 2003). Specifically, much study has focused on the big five personality traits’ (openness to new experiences, conscientiousness, extraversion, agreeableness, and neuroticism) influence on job performance, so prolific is the work in this area that there are several meta-analyses on this topic. One of the key conclusions from this stream is that personality traits predict job performance, with conscientiousness being the most robust predictor across various situations (see Barrick and Mount 1991; Tett et al. 1991). With regard to social network studies of job performance, prior research has examined employee interactions in a social network and how the ties among employees influence job performance at the individual level (e.g., Brass 1985; Cross and Cummings 2004; Kilduff and Krackhardt 1994; Sparrowe et al. 2001) and the group level (e.g., Balkundi and Harrison 2005; Hansen 1999; Tsai 2001).

The first objective of this study is to empirically validate previous studies that have shown that an individual’s centrality and density in their system-related advice networks influence job performance. There remains, however, the question of what drives an individual’s embeddedness in his/her social networks. Why are some individuals more densely connected to co-workers than others; or are more central within their networks than others? In social network research, the tenant of pure structuralism has been challenged. It has been proposed that the synergy between individualism and structuralism should be examined more closely (Kilduff and Krackhardt 1994). Individual traits of individuals in ego networks influence the behavior of the egos, influencing type and strength of ties (Kilduff and Tsai 2001, Mehr et al. 2001). By including personality and structural variables from advice networks, our understanding of the phenomenon will be increased. The second objective of this study is, therefore,
to develop a model that explains the influence of employee personality traits on job performance, mediated by employee system-related advice network structures. Finally, the third objective of this study is to empirically test the model in an organizational setting.

**Conceptual Background**

**Job Performance**

Job performance is one of the most important constructs in organizational research. It is the evaluation of how well one does one’s job. A key reason for the importance of job performance is that if an organization is staffed by employees who perform well (high performers), then that organization will be more productive and/or efficient. Another reason for its importance is that employees who perform better are less likely to quit (Hogan et al., 1998).

Two important aspects of job performance are: overall effectiveness and the extent to which an employee is a good team player, with the latter being important given the widespread use of teams and work groups in organizations. While overall effectiveness is a useful metric of job performance, an employee who is not a good team player may be of less value to today’s organizations. Researchers tend to focus on supervisor ratings of job performance to avoid theoretical and measurement biases. We thus examine two key components of job performance: (1) overall effectiveness; and (2) being a team player, both based on supervisor ratings of employee job performance.

**Personality**

Personality is the complex totality of what makes each individual different from others. It can be defined as a dynamic and organized set of characteristics possessed by a person that uniquely influences his or her cognitions, motivations, and behaviors in various situations (Ryckman 1993). Personality has been studied extensively since the early 1900s and there are many different conceptualizations of personality (Allport 1927; Pervin 1985; Roberts and DelVechio 2000). One conceptualization of personality that has been widely-deployed is the big five. The basic concept is that five broad traits constitute personality: neuroticism—defined as an enduring tendency to experience negative emotional states—individuals who score high on neuroticism are more likely to experience such feelings as anxiety, anger, guilt, and depression (Matthews and Deary 1998); conscientiousness—is defined in terms of characteristics such as responsibility, dependability, persistence, and achievement orientation (Barrick and Mount 1991); agreeableness—is defined in terms of being courteous, flexible, trusting, good-natured, cooperative, forgiving, soft-hearted, and tolerant (Barrick and Mount 1991); extraversion—is associated with being sociable, gregarious, assertive, talkative, and active; and openness (to new experiences)—is defined in terms of being imaginative, cultured, curious, original, broad-minded, intelligent, and artistically sensitive, a trait that is often associated with intelligence (Barrick and Mount 1991). The big five personality traits have been used as predictors of various outcomes in psychology and organizational behavior research.

**Big Five Personality Traits and Job Performance**

Understanding employee behaviors and outcomes (e.g., job performance) through the lens of personality has been of great interest since the 1990s (see Schmidt and Hunter 2004). If personality is a conceptualization of an individual’s characteristics and underlying beliefs, then it stands to reason that personality will have a major part in explaining organizational behaviors. The big five trait conceptualization of personality has been a particularly popular framework to use in attempting to better understand job performance (Barrick and Mount 1991; Ones et al., 1994; Tett et al., 1991). However, reliable empirical evidence has been lacking (Hurtz and Donovan 2000). Barrick and Mount (1991) found in their meta-analysis of big five personality to job performance studies that the different personality traits varied in their predictive reliability of job performance depending on type of job and the context of study. Indeed, the strongest of the personality traits to performance relationships involved conscientiousness in most job types and contexts (Barrick and Mount 1991). Hurtz and Donovan (2000) also noted that the big five personality traits did not have good predictive ability in all cases. Our paper hopes to show that personality influences an individual’s social networks, and it is through this influence that reliable prediction of job performance can be achieved.
Social Networks

The social network perspective draws on the patterns of interactions and exchanges within social units in which an actor is embedded to explain outcomes experienced by the actor. An employee’s position in a social network is linked to performance (Ahuja, Galletta, and Carley 2003) and provides advantages, such as organizational assimilation (Sparrowe and Liden 1997) and promotion (Burt 1992), or leads to disadvantages, such as organizational exit (Krackhardt and Porter 1986). The structure of social interactions enhances or constrains access to valued resources (Brass 1984; Ibarra 1993; Ibarra and Andrews 1993). Work-related resources, such as task advice and strategic information, are accessible through social networks that may also transmit social identity, norms, and social support (Podolny and Baron 1997).

Big Five Personality Traits and Social Networks

There has been an increased interest in understanding how personality influences social network structure (Borgatti and Foster 2003). Mehra et al. (2001) found that high-self monitoring leads to high network centrality. Burt et al. (1998) found that personality correlated with some network structures as well. Perhaps because personality traits partitioned into five categories is so parsimonious, researchers have drawn upon the big five framework in order to understand personality relationships with many behavioral outcomes (e.g., academic success, subordinate attitudes, alcohol consumption, etc.), they have typically been found to be effective and reliable predictors of such (Paunonen 2003). It is not surprising then that the big five traits have also been drawn upon to better understand social network relationships. For example, Klein et al. (2004) examined the big five personality traits as predictors of team network centrality. They found that neuroticism (low) was predictive of future centrality in advice and friendship networks. Russell et al. (1997) found that extraversion and neuroticism were related to both social network structures and social support. Our work seeks to explicitly examine how the big five personality traits influence getting and giving new system-related advice to co-workers, which in turn is expected to influence job performance.

Hypothesis Development

Given that job performance is a function of both ability and motivation, we frame our hypotheses development in terms of both the influence of personality on social network constructs and social network constructs on both ability and motivation. Figure 1 presents the research model. We present the justification for the various hypotheses in this section.

Figure 1. Research Model
System-related Advice Networks’ Influence on Job Performance

Given the interdependence and coordination required in today’s workplace, facilitating the work of others is a key part of being an effective and valuable member of the organization. It is reasonable to assume that individuals who wish to do well in their evaluations (which is a basis for pay raises and continued employment—a motivation) would wish to be perceived as getting along with their coworkers. One manner in which to visibly get along with others is to advise them in their work. Not only does helping others show a willingness to get along, it also makes the helping employee more visible to supervisory attention as well as shows a willingness to perform positive extra-role behaviors (Van Dyne and LePine 1998). The ability to help others with their system-related problems after an ES implementation can be critical to employee job performance. Therefore, we hypothesize:

H1a: Giving ES-related advice to others will positively influence supervisor rating of the advice-giver as a team player.

The second aspect of job performance is overall effectiveness. Effectiveness in one’s job is signaled to a supervisor through performing job tasks well and on time, as well as being seen to have appropriate knowledge and skills (Hunter and Hunter 1984). An individual can increase their perceived ability through signaling expertise in their area (Markus 2001). Actual ability would also be increased due to exposure to other employees’ problems, as a helper will have to develop skills in order to deal with them. Advising fellow employees, especially in times of change such as during ES implementations, signals to supervisors that one is learning quickly, creating value to the organization in challenging times, is in line with organizational goals, and could also be perceived as going beyond one’s own job tasks. Therefore, we hypothesize:

H1b: Giving ES-related advice to others will positively influence supervisor rating of the advice-giver’s overall effectiveness.

Given that getting along with others and being a team player is valued by the organization, it is reasonable to expect that employees will likely want to show that they are team players because it shows increased motivation in their work which is a factor in performance. In situations where a job task proves difficult, a method of signaling this would be the willingness to go to others for advice, especially related to the ES. This shows that an employee is not close-minded or embarrassed but rather that the employee respects and values others’ opinions, expertise, and input. Also, from a motivational standpoint, interacting more with fellow employees gives an employee opportunities to get to know fellow workers, to develop a rapport and understanding with them. Therefore we hypothesize:

H2a: Getting ES-related advice to others will positively influence supervisor rating of the advice-seeker as a team player.

As performance is a function, in part, of ability, employees are likely to seek out others whom they perceive as being able to advance their own knowledge of work tasks. Like training, informal advice from others is another method of increasing one’s knowledge and/or skills—i.e., abilities. Also, because it is impossible for any one individual to know everything, people use others’ knowledge through transactive memory systems (Borgatti and Cross 2003). When an employee encounters problems due to a lack of knowledge, it is likely that he or she will seek out others who are perceived to have the required knowledge (e.g., Hollingshead 1998; Moreland, Argote, and Krishnan 1996; Rulke and Galaskiewicz 2000). This situation will be exacerbated when a new ES is introduced. By seeking system-related advice from others, an employee will spend less time attempting to ‘reinvent the wheel’ and more time accomplishing job tasks, which increases effectiveness. Therefore, we hypothesize:

H2b: Getting ES-related advice to others will positively influence supervisor rating of the advice-seeker’s overall effectiveness.

Personality’s Influence on System-Related Advice Networks

Agreeable individuals are friendly, generous, and helpful in nature (Barrick and Mount 1991; Costa and McRae 1992). More likely to be helpful than less-agreeable individuals, individuals who have highly agreeable personalities are more likely to value getting along with others, and to be more willing to give advice. This makes them candidates for giving more system-related advice to their co-workers compared to less agreeable individuals.
Also, agreeable individuals are more likely to be viewed as approachable and willing to help, which gives them more opportunities in which to lend help to others when it comes to the new system that has been deployed in the organization. Therefore, we hypothesize:

**H3a: Agreeableness will positively influence giving ES-related advice to others.**

Extroverts typically enjoy interacting with others, more so than introverted individuals, they are more likely to help others because they have an affective motivation to do so. Also, because extroverts are more likely to choose to interact with others voluntarily, their daily contacts with others will likely be more numerous which would increase others’ access to them on occasions when advice is necessary. Extroverts tend to be enthusiastic and action-oriented (Barrick and Mount 1991; Costa and McRae 1992). Such extroverts will see the new system as an excellent opportunity for them to be the focal point of interactions and will, therefore, want to give advice to others than more introverted individuals. Therefore, we hypothesize:

**H3b: Extraversion will positively influence giving ES-related advice to others.**

Neuroticism refers to the tendency to experience negative feelings. Therefore, people high in neuroticism are far less likely to give advice to others because they are often in bad moods. They are less likely to perceive that they can advise others because highly neurotic individuals are more likely to interpret ordinary situations as threatening, and minor frustrations as hopelessly difficult (Costa and McRae 1992; Gross and John 2003). Those high in neuroticism are particularly likely to have substantial feelings of negative affect during times of change, such as an ES implementation, therefore they are likely to avoid interacting with others, much less helping others related to the new system even if they possessed the expertise on the new system. Therefore, we hypothesize:

**H3c: Neuroticism will negatively influence giving ES-related advice to others.**

Individuals go to others for advice when they perceive these others as having valuable knowledge, skills, and abilities that can aid in solving problems (Hollingshead 1984). While being available for advice, and approachable are important factors in determining which individuals give advice to others, it is important to note that the utilitarian aspect of getting advice will also determine which individuals give more advice to fellow employees. Individuals who are perceived to be more intelligent and/or knowledgeable are more likely to be approached for advice than those who are not perceived thus. Employees are likely to seek advice in times of change, especially related to the new enterprise system that is critical to all job activities in an organization, from individual who are open and easy to talk to regarding one’s problems. Further, individuals who are open will be eager to hear about and solve others’ problems as it will help them (open individuals) enjoy the vicarious experiences. Therefore, we hypothesize:

**H3d: Openness (to new experiences) will positively influence giving ES-related advice to others.**

Before one can seek out advice related to some work-related problem, one must first recognize that a problem exists. Open individuals are broadminded, intelligent and open to new things (Barrick and Mount 1991). This makes them more likely to recognize when a problem exists that will benefit from others’ advice. One aspect of advice seeking is the willingness to find new information. Open people are also intellectually curious and will, therefore, more likely seek advice from diverse sources when faced with a need for information. This is particularly likely to be present in an ES implementation context as it will call for substantial new knowledge. Therefore, we hypothesize:

**H4a: Openness (to new experiences) will positively influence getting ES-related advice from others.**

Conscientiousness is defined in terms of characteristics such as responsibility, dependability, persistence, and achievement orientation (Barrick and Mount 1991). Conscientious individuals avoid trouble and achieve high levels of success through purposeful planning and persistence. High levels of persistence and responsibility would indicate an individual who is likely to seek advice when needed from all possible sources. It is likely that conscientious individuals are positively regarded by others as intelligent and reliable which would lead to others being more willing to proffer aid. An ES implementation almost always creates the need for information from others. Conscientious individuals will seek out information related to the system so they can perform their job effectively. Therefore, we hypothesize:
H4b: Conscientiousness will positively influence getting ES-related advice from others.

Getting advice from others requires not only an understanding that there is a need for help, and willingness to get advice, but also requires others to be willing to give one advice. Individuals high in neuroticism are often perceived to be in bad moods, giving others the appearance that it is more difficult to communicate with them (Barrick and Mount 1991), thus hindering their ability to get advice from others. We expect this pattern to be followed in terms of system-related advice networks. Therefore, we hypothesize:

H4c: Neuroticism will negatively influence getting ES-related advice from others.

Method

Sample and Procedure

Our study was conducted in a supplier-focused business unit of a large, multi-national telecommunications firm. Data were collected through surveys and through archival data over a one year period. First, the big five personality traits were gathered from employees’ via a survey. Social network data was gathered three months after the annual review and after the implementation of an enterprise system. Nine months after the initial survey, supervisor ratings of job performance were collected.

Participants

Employees in the business unit studied served as liaisons to organizations that supplied the focal organization with parts and raw materials. The sample was made up of product line supplier liaisons who reported to product line liaison supervisors who reported to product group managers. The product group managers reported to a vice-president who headed the organizational unit. The unit of analysis in this study is an individual employee—i.e., a member of the business unit. The sampling frame consisted of all employees of a business unit in the organization. Membership in the business unit formed an appropriate boundary for our study because the members interacted with the same tools and performed the same activities as one another, allowing them to have knowledge that would be useful to one another.

There were 125 employees in the business unit, of which 87 people, including 22 women (25.3%), provided usable responses, for a response rate of 69.6%. The average age of participants was 38.9 with a standard deviation of 8.8. The average organizational tenure of participants was just over 5 years. The demographic profile of the respondents matched the business unit’s demographic profile. The non-respondents did not differ significantly from the respondents in terms of age or organizational tenure. It should be noted that in social network studies, a study with 87 participants is considered to be quite large (see Barsness, Diekmann, and Seidel 2005; Shaw et al., 2005).

Measurement

We used archival data to measure job performance. The measures were obtained from supervisor ratings from employee annual performance evaluations. Managers in the organization rated job performance in terms of two key dimensions: job effectiveness and getting along with other. The main difference between the construct of getting along with others and social network constructs is that the latter are employee perceptions of advice-seeking and giving relationships, while the former is a supervisor perception of each employee. The big five personality traits were measured using Costa and McRae’s Big five Personality inventory instrument (1992). This instrument has been extensively validated and applied. Based on Wasserman and Faust (1994), we collected social network data using sociometric techniques. Participants were provided with a fixed contact roster listing all employees of the business unit. Employees were asked to evaluate each member of the roster in terms of receiving and giving system-related advice in terms of frequency via a 5-point scale. This was deemed important as we wanted to capture extant networks amongst employees and not incidental contacts. Using UCINET 6.29, we calculated network density and network centrality for each member of the social network for each of the two networks—giving system-related advice to others and receiving system-related advice from others. An advice network is a set of individuals and the linkages between them, where the ties represent interaction directed towards seeking or providing system-
related advice from/to peers. An advice network matrix was created by having each person in the business unit assess their frequency of advice-seeking and advice-giving vis-à-vis all others (with values ranging from 0 to 5, where 0 indicated not connected and 1 through 5 indicated the extent of advice-seeking or advice-giving).

System-related give advice is operationalized using Bonacich’s power based centrality measure (Bonacich 1987) was computed for every vertex in the system-related give-advice network. Given an adjacency matrix A, the centrality of vertex i (denoted c_i), is given by \( c_i = \sum_j A_{ij} (a + b c_j) \) where, a is the normalization parameter and b is the attenuation factor. The adjacency matrix was constructed from the system-related give-advice matrix. The attenuation factor was chosen as 0 so that the centrality measure is directly proportional to the degree of each vertex, as the ties in question represent both “zero-sum” relations as well as “non zero-sum” relations (Scott 2000, p. 88).

System-related get advice is operationalized using a density measure was computed for each ego (employee), considering the out-neighborhood—i.e., actors with a tie from ego in the system-related get-advice network. The density is given by the number of dichotomized ties divided by the number of possible pairs.

**Results**

We used Partial Least Squares (PLS) to test the research model. The specific software package used for the analysis was PLS Graph, Version 2.91.03.04. PLS is more appropriate than factor-based covariance fitting approaches such as LISREL when sample sizes are small and models are complex, and the goal of the research is explaining variance. Similar to traditional regression analysis, the variance explained and the sign and significance of path coefficients can be used to assess nomological validity.

The measurement model estimation provides information regarding reliability, convergent validity, and discriminant validity. Of the various constructs used in our model, the only constructs for which reliability and validity was assessed using the measurement model were the big five personality constructs because they are measured using multiple items. Network centrality and network density are each determined using the measures and formulas presented earlier, resulting in one score per construct per individual. The scales measuring the big five personality traits were reliable, with internal consistency reliability (ICR) scores being well above the recommended level of 0.70. Table 1 presents the descriptive statistics and inter-construct correlations. Convergent validity is adequate when constructs have an average variance extracted (AVE) of at least 0.50 and for satisfactory discriminant validity, the AVE for the construct should be greater than the variance shared between the construct and other constructs in the model (Chin 1998). Based on the results in Table 1, all five personality trait constructs possess adequate internal consistency and discriminant validity. The loadings for the personality traits were all greater than.70 and the cross-loadings were all.25 or less, further supporting internal consistency and discriminant validity. The assumed loadings on the other constructs of network density, and network centrality were 1. Convergent validity was supported by loadings for conscientiousness, neuroticism, agreeableness, openness, and extraversion being greater than.70 and discriminant validity was supported by all cross-loadings being less than.30. Both social network constructs were correlated with each other.

**Table 1: Descriptive Statistics and Correlations**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>s.d.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Neuroticism</td>
<td>1.87</td>
<td>0.33</td>
<td>.75</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Extraversion</td>
<td>3.99</td>
<td>0.99</td>
<td>.21*</td>
<td>.77</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Conscientiousness</td>
<td>4.51</td>
<td>1.03</td>
<td>.15*</td>
<td>.09</td>
<td>.82</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Openness</td>
<td>3.59</td>
<td>1.72</td>
<td>.19*</td>
<td>-.05</td>
<td>-.15*</td>
<td>.73</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Agreeableness</td>
<td>4.19</td>
<td>1.21</td>
<td>-.02</td>
<td>.42***</td>
<td>.03</td>
<td>-.14</td>
<td>.80</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Sys get advice</td>
<td>5.17</td>
<td>2.38</td>
<td>-.20***</td>
<td>.34***</td>
<td>-.20***</td>
<td>.24***</td>
<td>.21***</td>
<td>NA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Sys give advice</td>
<td>5.04</td>
<td>2.27</td>
<td>-.23***</td>
<td>.30***</td>
<td>-.20***</td>
<td>.29***</td>
<td>.28***</td>
<td>.33***</td>
<td>NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Effectiveness</td>
<td>5.01</td>
<td>0.95</td>
<td>.23***</td>
<td>-.03</td>
<td>.59***</td>
<td>-.00</td>
<td>.05</td>
<td>.45***</td>
<td>.41***</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>9. Being a team player</td>
<td>4.75</td>
<td>0.87</td>
<td>.09</td>
<td>.53***</td>
<td>.01</td>
<td>-.01</td>
<td>.51***</td>
<td>.42***</td>
<td>.40***</td>
<td>.04</td>
<td></td>
</tr>
</tbody>
</table>

n=87; *p <.05; **p <.01; ***p<.001; Diagonals are ICRs; NA is because it is either calculated or archival.
Table 2 shows the results of our PLS analysis. For the most part, all relationships were as hypothesized. However, there were some surprises. Conscientiousness was particularly interesting. First, conscientiousness was related to both giving and getting advice, rather than just the hypothesized getting advice. Also, the relationships between conscientiousness and the network constructs were negative, contrary to expectations. Second, the conscientiousness to job performance relationship was not fully mediated by ES-related giving and getting advice from the network, instead, conscientiousness had significant relationships with both the networks constructs (negative) and job performance (positive). This would suggest that there is a suppressor variable present (see Shieh 2006 for an explanation of suppressor variables). In fact, all five of the big five personality traits were found to significantly influence both the getting and giving of advice.

When controlling for giving/getting advice network constructs, our findings were similar to previous research on personality traits and job performance—for job effectiveness the only significant personality trait was conscientiousness; however, surprisingly, we found conscientiousness to not influence supervisor ratings of being a team player and not so surprisingly, we found agreeableness and extraversion did. We found that both getting and giving advice to others significantly influenced both metrics of job performance, as hypothesized, explaining 29% of the variance in job effectiveness and 34% of the variance in being a team player. Figure 2 shows the resulting final model, including supported and hypothesized relationships, and discovered relationships.
### Table 2: Structural Model Results

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Independent Variables</th>
<th>$R^2$</th>
<th>$\beta$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall effectiveness</td>
<td>Neuroticism</td>
<td>.30</td>
<td>.16</td>
</tr>
<tr>
<td></td>
<td>Extraversion</td>
<td>-.15</td>
<td></td>
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$n=87$;  
* $p < .05$;  
** $p < .01$;  
*** $p < .001$. 

Discussion

The present research aimed to understand the role of employee personality traits on their advice networks, and the network structures’ influence on employee job performance in the context of an enterprise system implementation. We examined employees’ system-related informal advice networks and job performance. We conceptualized advice networks in terms of system-related advice networks and further broke down advice ties in terms of giving and getting ties to gain an in-depth explanation of employee job performance. The relationships between employee personality traits, advice networks and job performance were then empirically tested in a longitudinal field study. The results largely showed empirical support for the proposed relationships between the big five personality traits, system-related giving and getting advice, and employee job performance, with our proposed model explaining over 40% of the variance in job performance—in both getting along with others and job effectiveness.

Contributions

The results of the study suggest that depending on the aspect of job performance being studied, different traits are more important than others such as agreeableness and getting along with others versus conscientiousness and job effectiveness. Thus, researchers and managers alike should be cognizant that depending on what they consider most important in performance, different personality characteristics are important. A partially-mediated model was supported for both job performance constructs, with the variance explained by personality and advice networks being higher than either one separately. Our study showed that conscientiousness has a negative effect on ES-related advice networks, but positive effect on job effectiveness. In other words, conscientious workers are themselves high performers, but that they are less helpful to co-workers, which implies a possible wasted resource. The results also show that extraversion and agreeableness have a direct effect on being a team player over and above advice networks, which highlights the importance of personality when considering individuals for employment, especially in organizational context where change, such as technology implementations, is a frequent occurrence.

The study contributes to our understanding of employee job performance in times of ES implementations, a common occurrence in organizations today. Clearly, advice networks can help above and beyond traditional predictors studied in the IS and organizational behavior literature. By integrating research from various streams of research,
the current work provides an important starting point for future investigations into potential interventions that can help contend with challenges of low performance immediately after a new technology is implemented. This paper also contributes to the network literature in a variety of ways. First, it integrated personality, advice networks, and job performance into a single model. Next, this work highlighted the role of personality in advice networks, and emphasized the separate roles of personality and advice networks in driving job performance. Finally, it is possible that the findings from this research could inform earlier ambiguous results on the personality-job performance relationship as well as the network-job performance relationship.

Our research also makes contributions to practice. While personality itself is not very tractable, it provides important pointers to the types of individuals that may need additional support during a new ES implementation, given that all big-five personality traits are significantly related to giving and getting system-related advice. This is particularly important because both giving and getting system-related advice is significantly positively associated with both metrics of job performance. Our findings suggest that managers will be able to identify those individuals who would be less likely to participate in getting and/or giving system-related advice. Incentive programs designed to increase system-related advice seeking and giving behaviors will thus be important. For example, conscientious individuals are high performers but they appear to work in isolation. They are less likely to seek advice, thus suggesting that they could be working inefficiently perhaps because they view seeking advice as being antithetical to their personality and/or mistakenly viewing advice seeking as inefficient. They are also less likely to give advice, thus not sharing their accumulated knowledge, which could be, in part, due to conscientious individuals viewing advice giving as a poor use of their time or taking time away from their own work. Providing incentives for advice seeking is somewhat counterintuitive but a good start in most organizations would be to not frown upon advice seekers and also reassure advice seekers that such a behavior will not be viewed as a sign of lack of skill/knowledge or incompetence, but rather such a behavior should be encouraged as it leads to greater effectiveness.

**Limitations and Future Research Directions**

Social network studies are always difficult to conduct. We, therefore, limited our social network data collection to a focal business unit. We did not examine ties to employees in other units in the organization, or ties to others outside the organization. Understanding such ties and the role they play would help us deepen our understanding of the role of advice networks. While such future research would be important, it will be quite difficult to conduct due to practical constraints. To address such constraints, researchers could examine such ties and strength of ties by examining email archives. The findings from this work should be related to individual-level constructs, such as leader-member exchange (for a review, see Liden and Maslyn 1997) and perceived organizational support (for a review, see Rheades and Eisenberger 2002). Other sources of increased job performance could also be integrated into the model and examined. Another issue is the time delay in the measurement of the social network constructs and the actual ES implementation. While three months is not a long time delay, it does introduce the potential for confounds that limit our findings. One alternative approach is to have measured the social network constructs during the ES implementation, but that comes with the limitation of the new ES-related network not being fully developed. Finally, it is possible that the non-respondents from the sample group could have been statistically significantly different from those who did respond. As we obtained both in-degree and out-degree responses (Wasserman and Faust 1990) from individuals regarding their system-related advice networks, we computed the respondents’ views of the non-respondents in terms of their positions within the system-related advice network, and compared these values with the values computed for the respondent group. No statistically significant difference was found between the respondent and non-respondent groups. While this is not absolute proof that non-response bias is not existent, it does offer some evidence that non-response bias is minimal.

Another interesting way to extend this study would be to investigate if the advice network is also reflected in mindful usage of the system—i.e., do employees consider how their peers may benefit from insights and information that they possess and do they share these with others without being asked? This line of research may help generate insights into expert employees and how they can be best utilized for organizational benefit. Examples of such could include support for directing helpful content, data, or insight summaries to selected peers. Also, we did not investigate the use of specific media for obtaining and providing advice. Past research suggests that employees’ use of media (such as electronic mail) is linked to their level of being informed about their company and commitment to its management’s goals (Kraut and Attewell 1997). Future research should examine how the use of different media underlying advice networks may relate to employee performance.
Conclusions

Our research studied the role of an individual’s personality on informal ES-related advice network structures, which influenced individual job performance over a one year period in the context of an ES implementation. Conscientiousness, one of the big five personality traits, was shown to be the most important antecedent of job performance, which follows the pattern of earlier research. However, we found that all five personality traits were predictive of the network centrality and density of individuals’ ES-related advice networks, which were both predictive of employee job performance. This finding is important, because it explains the relationship between personality and job performance that intuitively seems apparent, but has not received strong empirical support in the past. In addition to highlighting the relationships between personality and social structure and social structure and performance—contributions to management and social networks literature—our findings are an important contribution to better understanding employee job performance in the context of a new ES implementation.

REFERENCES


