

Voluntary Turnover in a Distributed Work Setting: An Examination of the Role of Spatial Proximity and Role Similarity in Project Affiliation Networks

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ABSTRACT

Project affiliation networks (i.e., individuals connected through common project team memberships) create fruitful junctures to understand how individuals are connected to others in their social contexts, especially in distributed organizations. Advances in technology-mediated environments further help individuals develop connections with their colleagues who may or may not be collocated. This embeddedness creates inertial pressures on individuals and constrains them to conform to firm norms and thus stay with the firm. In this paper, we examine whether ties to those who quit the firm can trump the feeling of connection to the firm and thus motivate subsequent quit decisions. We argue that individuals with a greater number of defectors in their project affiliation networks are more likely than others to leave the firm and the influence on those focal individuals will be higher when they are collocated and occupy similar professional roles as the affiliated defectors. We analyze complete project affiliation data linking 728 geographically distributed employees at a multi-national high technology firm across five years to test these arguments. During this time 183 employees voluntarily left the firm. The findings support our arguments and suggest that project affiliation networks in such settings occasion social comparisons among employees and serve as conduits for the diffusion of their career mobility decisions. We discuss the implications of our work for managing voluntary turnover in knowledge intensive distributed organizations.

Author Keywords

Social network analysis; distributed teams; voluntary turnover.

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ACM Classification Keywords

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INTRODUCTION

When work is organized around geographically distributed teams, effective coordination of tasks, exchange of information, and resolution of conflicts among team members become non-trivial challenges to realize optimal team outcomes [15, 18, 30]. The social network perspective has offered a fruitful lens to examine these issues in the context of distributed work. For instance, we know that dense networks among team members increase group solidarity, facilitate information exchange, and strengthen attachment to group norms [16, 45, 59, 60].

Similarly, the technology-mediated work environments help individuals accomplish interdependent work, as well as develop connections with colleagues who may or may not be collocated. Such connections further serve as conduits to the flow of signals that could influence their workplace decisions, including the one to quit the firm. However, we know very little about what happens when an individual's connected colleagues at the workplace decide to quit the firm. Does the individual view the departures as pathways to increased resources and opportunities and thus strengthen his attachment to the firm? Or, do the departures create social pressures on the focal individual to also leave? Further, what happens when a colleague who quits occupied a similar role and worked in the same geographical location as the focal individual? These questions assume significance in the contemporary free-agent labor markets [13] where career trajectories unfold in a series of short stints at multiple firms as opposed to a life-long career in a single firm [25]. Workplace connections are likely to play a different role in such scenarios and analyses of those connections stand to offer productive opportunities to advance our

understanding of employee quit decisions in distributed organizations.

Recent studies report that an individual's level of attachment to an organization is influenced by connections with co-workers and the greater those connections, the slower the decay of attachment to the organization over time [11]. Ties at the workplace can provide an individual with co-worker support and a sense of belonging and are found to be negatively related to voluntary turnover [21, 44]. In essence, ties to other employees create inertial pressures on an individual and constrain him to conform to firm norms and thus stay with the firm.

While these ties bind an individual to fellow coworkers (and the firm in general), we believe that ties to others who leave the firm activate different mechanisms which can weaken these binds. Mainly, an individual who observes coworkers making career moves is likely to compare himself to those others and make behavioral changes in his own career. We propose that the observation of one or more defectors can trump a feeling of connection that the individual might feel with others who don't choose to leave the firm. Further, we suggest that the influence of those defectors will be higher when they were collocated and occupied similar professional roles as the focal individual.

In the following sections of the paper, we first provide an overview of the changing nature of careers and explain the role of social comparison mechanisms in such contexts. We highlight existing research using a relational perspective to understand voluntary turnover and subsequently introduce our hypotheses related to the role of geographical proximity and role similarity in shaping career mobility decisions.

We then proceed to present the research setting, analyses and, finally conclude with discussion of our findings and their implications. In sum, we advance theory by explaining the powerful influence of co-worker decisions on employee turnover through comparison mechanisms. In doing so, we bring together network-related ideas in organizational behavior and distributed work fields. This synthesis also has key implications for managers of distributed teams.

CAREER MOBILITY AND SOCIAL COMPARISON

Recent studies in the career field suggest that individuals manage their careers in proactive, self-directed ways driven by values and subjective success criteria [2]. Often referred to as the protean career [21, 26], it proposes that individuals must create career opportunities through networking and actions aimed at enhancing their visibility. Thus, skilled and qualified individuals frequently search for career paths and opportunities outside organizational boundaries that provide such satisfaction [29]. This differs from prior eras, where

individuals had long term commitments to one firm and top performers rarely changed employers.

One aspect of the boundaryless career is that individuals are often more strongly connected to co-workers than they are to the formal firm [2]. Advances in information and communication technologies allow them access to each other's knowledge, create communities of common interest and foster collaboration across locations [58]. Classic network influence studies report that social interactions determine everything from voting behaviors to prescribing behaviors among physicians [40, 14]. We propose that increased opportunities for social interaction at the workplace can also influence behavioral changes related to career mobility. In contemporary labor markets, network ties to those who leave a firm influence career decisions through social comparison mechanisms and access to novel information.

Social comparison theory [22] suggests that individuals rely on others to make decisions and form attitudes. If comparison with a referent other reveals differences in thoughts, feelings or behaviors, the focal individual is likely to change his or her thoughts, feelings, or behaviors to become consistent with the referent other. Such comparisons are especially likely in risky and ambiguous situations. When an individual is unsure how to behave, he looks to referent others for cues. A similar mechanism is found in the heart of balance theory [28], which states that a person seeks to be congruent with those she likes. When she is not, she feels dissonance, and seeks to reduce it either by changing behaviors or changing ties.

In work settings, researchers find that working with others who are searching for a job increases the salience and perceived viability that an individual will also consider leaving for another firm [21]. We extend such work by proposing that social comparison mechanisms play an important role in shaping career mobility decisions. While new careers promote independence and subjective success, they also lack the certainty and stability of the traditional upward trajectory. As a result, individuals might look to referents to help reduce uncertainty and make sense of possibilities of a boundaryless career. Therefore, we propose that individuals are strongly influenced by the career moves of co-workers in attempts to define security, stability, and career success. When such referent others leave and cut their formal ties with the firm, the focal individual faces pressure to do the same.

Consider the example of employees A and B who work together on the same work team. If A decides to voluntarily leave the firm, employee A's departure might be viewed as an opportunity for B to obtain more resources and power within the firm. For example, in an earlier study among employees of fast-food restaurants, it was found that an individual's job satisfaction increases following the turnover of unhappy friends [38]. We

believe that the boundaryless nature of professional careers makes this reaction less likely. Rather than seeing opportunities within the same firm, we believe that B is more likely to emulate A due to social comparison pressures. We propose that B's tie to A will be stronger than B's tie to the firm [25], and therefore B is more likely to seek to form new ties with new firms than to maintain his or her tie to the current firm. If B keeps her tie to the firm, she is likely to experience dissonance as well as uncertainty as to whether she is in accordance with a successful trajectory. If employee C (also a project teammate) decides to leave the firm, employee B faces additional pressure to follow suit.

In addition to social comparison mechanisms, we acknowledge that individuals with co-workers who quit are likely to gain access to new employment opportunities through these existing ties. Social ties can also serve as pipes through which resources flow [50]. Network literature has established that ties to disconnected groups in a network can be sources of novel resources and opportunities [10, 24]. In our example, when employee A joins a new firm they create bridging ties with those who remain at the organization. These bridging ties are possible sources of novel resources such as knowledge about job opportunities to those who remain. The knowledge of these opportunities would be clearly useful for them. Therefore, for the above reasons, we expect that an individual's career decisions are highly influenced by their social connections with fellow employees. Thus,

Hypothesis 1: The more connections that an individual has to co-workers who leave a firm, the more likely the individual will also leave the firm.

SPATIAL PROPINQUITY

The role of spatial dispersion has been central to several studies in the area of distributed work. Scholars have paid significant attention to understand how geographical distance influence collaboration, information exchange, trust, conflict and, shared understanding among team members and various team outcomes [36, 46, 57]. In general, it is reported that opportunities for informal, face-to-face and spontaneous communication between members who work in different geographical locations are highly constrained.

In an earlier study, Allen [1] claimed that when offices of engineers were 30 meters apart, the frequency of communication between them dropped to nearly the same level as with people working in offices that were many miles away. Further, uneven exchange of information, limited awareness of each other's social context, and ambiguities related to the interpretation of information significantly impact interactions between members working in such contexts [17, 27, 32, 35].

While significant advances have been made to design technologies to stimulate and strengthen the

communication and interaction in such settings, Bradner and Mark [8] report that in computer mediated situations, people are less cooperative, less likely to be persuaded and more likely to deceive others when they work in different cities.

In the context of distributed software development in an offshoring context (this study setting), onsite members typically interact with clients to specify requirements, map change requests and, review project progress. The offshore members, who are further distributed within various offices in the host country of the focal firm, mainly focus on delivering against those requirements and meeting client expectations. This distance creates differences in workplace experiences and knowledge heterogeneity between these different groups and can trigger occasions for conflicts, increased collaboration costs and errors and ultimately delays in project delivery.

In an extensive review of proximity and distance in work groups, Kiesler and Cummings [36] report that opportunities for increased face-to-face communication that are often available for collocated members increases information exchange, interpersonal attraction, felt commitment and, greater contribution by team members. Further, repeated interactions in between members in collocated settings strengthen group identity and cohesion. Similarly, Olson and Olson [48] highlight the importance of synchronous collocated interactions such as rapid feedback and nuanced information that are essential for individuals working on software projects.

Following this line of reasoning, we propose that the information of the quit decision of an employee will more quickly spread among those in the same office location than across different locations. In a highly mobile labor market where employees actively seek cues from their colleagues to determine the acceptability of leaving a job in order to achieve career success, quit decisions of proximal employees are more likely to influence other collocated members than those in other locations.

However, not all individuals will be equally influenced by ties with proximal co-workers when making career decisions. For instance, those with established security in their careers will be more likely to be subjectively pleased with their accomplishments and perhaps less likely to seek change. In contrast, individuals with uncertainty in terms of career success will likely be more motivated to continually seek out new opportunities outside of the focal organization. We propose that individuals who feel stability in their current positions are less likely to look to others for cues regarding career movements. Job tenure is one proxy for such security. Therefore, those with greater firm tenure are less likely to be interested in external opportunities and therefore less likely to seek comparisons with those who leave. In addition, these individuals are less likely to view their careers as novel, risky, or ambiguous situations. Thus,

Hypotheses 2A: The greater percentage of those teammates who are in the same geographic office and leave, the more likely the individual will leave the firm.

Hypotheses 2B: The above relationship will be moderated by tenure such that younger employees will be more influenced by proximal others.

ROLE SIMILARITY

Extensive evidence suggests that social interactions are more likely to be triggered between similar actors in various instances ranging from marriage to investment decisions. Marriages are likely between individuals with similar level of education and religion and investors invest in same industries [41, 53]. While it is difficult to specify what dimensions of similarity will be salient in a given context, there is strong empirical support to the hypotheses that people who are similar in age, gender, ethnicity and, educational level are much more likely to interact with each other than with people who are heterogeneous in these aspects [19].

This tendency of similar individuals to associate with one another is referred to as homophily and it suggests that similarity breeds connection. Monge and Contractor [45] highlight Byrne's [12] similarity-attraction hypothesis and self-categorization theory [54, 56] to explain homophily. Byrne postulate that people are more attracted towards those with whom they share similar attributes. Self-categorization theory proposes that people self-categorize themselves and others in terms of age, role, gender, education and so on and they use these categories to differentiate between similar and dissimilar others.

Podolny [49] offers an alternate explanation by highlighting the role of the status of people. Similarity is not required nor expected for two actors to initiate an association. If there is a generally recognizable ordering of the attributes on which actors differ, high status actors attract others. In the work setting, those who occupy higher status roles are likely to enjoy more interactions than those who are in the lower level of the hierarchy.

Although much of the studies on homophily in networks are conducted among collocated members, Yuan and Gay [60] argue that their findings are generalizable to distributed work settings as well. They argue that advances in communication technologies and their creative usage enable employees to locate and connect with similar others at work.

While much of the studies have focused on similarities in gender and race, [31, 33, 43] we focus on role homophily in our study. In highly competitive organizations, such as our study setting, people who occupy similar formal roles compete with each other another for time, attention and, resources of the shared parties and any action that one takes is likely to be emulated by the other. For instance, if employee A, who occupies role X, enrolls in an executive

education program, employee B in a similar role may feel pressure to keep pace, and will thus enroll in a similar program. We believe that similar pressures influence career decisions as well.

Consider the continued example of A and B who work together on the same work team. If A and B occupy the same professional role, it is possible that they view each other as competitors and if one leaves the firm it will open up additional opportunities for the other at the firm. But we believe that the boundaryless nature of careers makes this reaction less likely. Instead, we believe that B is more likely to see A as a social referent due to shared job roles and shared work experiences and therefore emulate A. Likewise, if A decides to stay at the firm, B is likely to stay at the firm. In addition, for the reasons mentioned earlier, we propose that people with greater tenure in the organization are less likely to be influenced by the quit decisions of others who occupy similar professional roles. Thus,

Hypothesis 3A: The greater percentage of those teammates who occupy the same professional role and leave, the more likely the individual will leave the firm.

Hypothesis 3B: The above relationship will be moderated by tenure such that younger employees will be more influenced by similar others.

RESEARCH SETTING

We test our hypotheses at a global technology firm. The firm has over 130,000 employees with 2011 revenues projected to surpass 6 billion USD. Within the firm, employees are assigned to primarily work on specific client accounts. Some accounts consist of more than 1000 employees. Within the account groups, employees are further separated into project teams. Project teams are often voluntary and temporary in nature and range in size from 3 to 250 people. Most teams are formed with the goal of meeting specific client needs and typically exist for three to eighteen months. Individuals can work on more than one project team at a time. Some sets of individuals frequently work together on the same teams whereas others transition from team to team based on requirements.

During the study period the focal firm maintained a positive global reputation allowing it to be very selective in hiring highly qualified individuals. According to qualitative interviews with members of the Human Resources Department, job openings at the firm attract a large pool of candidates, allowing them to be very selective. In addition, focusing on employees from a single firm allows us to control for differences in opportunity structures of internal labor markets [4].

DATA

For our analysis, we focused on all employees associated with one client account. The client account was active from January, 2007 to August, 2011. During this time 728

individuals formed 301 project teams based on account needs. Employees assigned to this account were located at 30 offices locations throughout North America, Europe, South Asia and Asia Pacific. The largest office housed 256 of the employees in this study (the average office size was 30.2 employees, $SD = 66.65$). Employees occupied 64 various professional roles (the most common professional role was Test Engineer, held by 109 employees). All employees had at least a university degree and formal training in areas ranging from computer science to finance. During the study period 183 employees voluntarily left the firm.

To analyze the social influence of turnover, we used longitudinal project team data to create the project affiliation network. We first created a 3-way person-by-team-by-time stacked matrix. This allowed us to identify connections between individuals and specific project teams at each point in time. We then converted these data into person-by-person data, allowing us to identify which individuals worked on the same project teams at each point in time (between January, 2007 and July, 2011). By matching these relational data with demographic and attrition data provided by the Human Resources Department, we were able to investigate possible relational influences of voluntary turnover in the focal firm.

DEPENDENT VARIABLE

Quit. The key variable in our study is whether or not the focal individual voluntarily left the firm during the study period. Of the 728 employees, 183 quit during the study period. Part of the leaving process at this firm involves an exit interview with the Human Resource Department. During this interview the employee is asked to indicate their primary reason for leaving the firm. The most common reasons provided were leaving to join another company, and leaving for an undisclosed personal reason. Of the 183 who quit, 90 indicated that they were leaving to join a competitor or start their own firm. Forty-six of those who quit indicated that they were leaving for personal reasons.

CONTROL VARIABLE

We obtained demographic information about each individual that might have also influenced their decision to voluntarily leave the firm. Demographic data included *gender*, *year of birth*, and *organizational tenure*. The sample consisted of 262 women and 467 men. The average year of birth of the employees was 1982.32 ($SD = 4.4$). The average organizational tenure among employees was 4.56 years ($SD = 2.67$). We used project data to determine the number of project teams that each individual worked on and the number of project teammates who remained with the organization throughout the study period. The average *number of project teams* was 2.18 ($SD = 1.88$). The average *number of teammates* was 50.12 ($SD = 56.12$).

INDEPENDENT VARIABLES

Percentage of teammates who quit. Our key independent variable captures the presence of quitters among project team members. Using the time stamped data we determined the percentage of each individual's project team members who voluntarily left the organization. The average teammates who quit measure was 9.71 ($SD = 11.58$).

Collocated quitters. We used locational data to identify which sets of project teammates were located at the same office building at the same point in time. We then used this relational matrix to calculate the percentage of each individual's collocated project teammates who also quit. Among individuals with at least one coworker who quit, the average percentage of collocated teammates who quit was 18.95 percent ($SD = 16.44$).

Same role quitters. We used job role data to identify which sets of project teammates occupied the same professional role and used this to determine what percentage of each individual's project teammates were role similar. Among individuals with at least one coworker who quit, the average percentage of teammates with same role who quit was 16.20 percent ($SD = 22.80$).

ANALYSES

To test our hypotheses, we used a cross-sectional logistic regression model to test whether or not each individual quit at some point during the study period. We created all network measures in UCINET 6.365 [6] and used Stata 11.0 for regression analysis. Please see Table 1 for descriptive statistics and correlations of our study variables.

Recognizing that a cross-sectional approach does not fully capture the longitudinal nature of this process, we ran a secondary analysis using Cox proportional hazards regression model to strengthen our analysis. The Cox model is a technique typically used in survival research to explore the effect of explanatory variables upon the time that it takes for an event to occur. In this study, we created rolling six month project network windows as our time slices to analyze quit events. The model takes time into account and fits hazard ratios to the variables, which are interpreted as the effect of each variable on the risk that the focal individual will quit the firm. In other words, we used data from the projects that each individual had worked on in the past six months, to identify the influence of our independent variables on quitting behavior. The decision to use six month windows was based on our belief that ties from longer than six months ago would not have as much influence on the individual's decision (as these former teammates may no longer be viewed as referents).

		Mean	S.D.	1	2	3	4	5	6	7	8
1	Year of birth	1982.32	4.41	1							
2	Organizational tenure	4.57	2.67	-0.57	1						
3	Number of projects	2.21	1.91	-0.08	0.27	1					
4	Number of teammates	50.12	56.79	0.06	-0.03	0.15	1				
5	Teammates who quit (%)	19.02	15.49	-0.17	0.18	-0.01	0.05	1			
6	Collocated quitters (%)	18.95	16.44	-0.11	0.11	0	0.11	0.78	1		
7	Same role quitters (%)	16.20	22.80	0.08	-0.02	0.02	0.16	0.43	0.4	1	
8	Female	262 = F	NA	0.3	-0.17	0.02	-0.04	-0.08	-0.06	0.04	1
9	DV= Did employee quit	183 = yes	NA	-0.04	-0.11	-0.14	-0.08	0.18	0.13	0.11	0

Table 1: Descriptive Statistics and Correlations of Study Variables

RESULTS

Regression outputs from the logistic regression models are presented in Table 2. Model 1 provides support for Hypothesis 1 predicting that individuals with project teammates who quit are themselves more likely to quit

(Model 1 $e^b = 1.03 < 0.01$). Results indicate that among individuals with at least one quitter in their project team, the greater the percentage of quitters in each individual's co-working network, the greater the likelihood that he or she also voluntarily left the firm during the study period.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
	DV Quit						
Female	1.10 (0.21)	1.13 (0.24)	1.10 (0.23)	1.10 (0.24)	1.10 (0.24)	1.07 (0.21)	1.14 (0.24)
Number of Projects	0.84* (0.06)	0.79** (0.06)	0.79** (0.06)	0.78** (0.06)	0.79** (0.06)	0.83* (0.06)	0.80** (0.06)
Year of birth	0.94* (0.02)	0.95* (0.02)	0.95* (0.02)	0.94* (0.02)	0.94* (0.02)	0.95* (0.02)	0.95t (0.03)
Tenure at firm	0.84** (0.04)	0.85** (0.04)	0.97 (0.07)	0.84** (0.00)	0.87** (0.05)	0.93 (0.06)	0.83** (0.04)
Number of teammates	1.00** (0.00)						
Percent of teammates who quit	1.03** (0.00)					1.05** (0.00)	
Collocated teammates who quit (%)		1.01* (0.01)	1.04* (0.01)				
Same role teammates who quit (%)				1.01* (0.00)	1.02* (0.01)		
Interaction of Tenure with percent of teammates who quit						0.99* (0.00)	
Interaction of Tenure with collocated quitters			0.99* (0.00)				
Interaction of tenure with same role quitters					1.00 (0.00)		
Percent who quit to join a competitor							1.03* (0.01)
Percent who quit for personal reasons							0.99 (0.02)
LL	-377.13	-318.26	-315.27	-317.63	-316.94	-374.62	-313.34
N	728	598	598	598	598	728	598

Table 2: Odds Ratios from Cross-sectional Logistic Regression Models

These results hold when controlling for number of teammates, number of projects and other demographic attributes. Model 2 provides support for hypothesis 2A, indicating that the greater the percentage of defectors who are located in the same office as the focal individual, the more likely the focal individual will also quit (Model 2 $e^b = 1.01$, $p < 0.05$). Model 3 provides support for hypothesis 2B indicating that organizational tenure moderates the influence of collocated quitters, such that individuals with greater tenure are less influenced by the career decisions of proximal teammates (Model 3 $e^b = 0.99$, $p < 0.05$).

Model 4 provides support for hypothesis 3A indicating that having teammates with the same professional role who quit increases the likelihood that the focal actor will also quit (Model 4 $e^b = 1.01$, $p < 0.05$). We fail to find support for Hypothesis 3B (Model 5 $e^b = 1.00$, $p > 0.05$). Results from our cox regression in Model 8 (see Table 3) provide additional support to our hypotheses indicating that each increase in the percentage of teammates who quit increases the risk that the focal individual will also quit the firm (Model 8 Hazard ratio = 1.02, $p < 0.05$).

	Model 8
	DV Quit at end of month
Female	0.93 (0.16)
Number of recent projects	1.21* (0.10)
Year of birth	1.09** (0.03)
Tenure at firm	1.00 (0.00)
Number of recent team members	1.00 (0.00)
Percentage of recent team members who quit	1.02* (0.01)
LL	-1522.30
Number of observations	31793

Table 3: Hazard Ratios from Cox Regression Analysis

We acknowledge two plausible alternative mechanisms that might explain our core results: (1) individuals who work on struggling project teams might all independently choose to leave due to the outcome of the projects (“struggling project”); and (2) individuals primarily base their career decisions on opportunities presented by former colleagues who now work outside of the firm (“outside ties”). To address these competing mechanisms, which might result in findings similar to our models, we created a critical experiment, in the spirit of Lave and March [39].

Table 4 presents three empirical tests (rows) to determine whether or not one theorized mechanism is superior to

others. The columns correspond to competing theories and present the predicted results of each empirical test if the theorized mechanism were true. For instance, if the struggling project theory of turnover is correct, we predict the following: (1) tenure would not have a significant influence on career decisions (i.e., all members of a struggling project are likely to be equally affected regardless of tenure at the firm); (2) the reasons provided by teammates who quit would not influence each individual’s career decision (in theory the decision would be based on the focal actor’s experience with the struggling project); and (3) structurally equivalent actors (i.e., those with ties to the same third parties in the project affiliation network) would not make the same career choices. Note that the outside ties and social comparison theories have unique column profiles of predicted results. The actual results of multiple analytic tests are provided in the fourth column of Table 4. For instance, we find that working with those who join a competitor influences quit decisions but working with those who quit for personal reasons does not. This seemingly discounts the “poor performing project” theory. We also find that structurally equivalent actors are more likely than others to make similar career decisions seemingly discounting the “outside ties” theory. Taken together, we believe the results of these three empirical tests provide additional support for the social comparison theory and discount alternative theories as the primary mechanism.

Empirical Tests	Struggling Project Theory	Outside Ties Theory	Social Comparison Theory	Actual Findings
Are early stage employees more influenced than older employees?	No	Yes	Yes	Yes (see Models 3 & 6 in Table 2)
Are some coworker reasons for quitting more influential than others?	No	Yes	Yes	Yes (see Model 7 in Table 2)
Do structurally equivalent actors make the same career choices?	No	No	Yes	Yes (see Table 5)

Table 4: Critical Experiment with Predicted Results for Plausible Alternative Mechanisms and Actual Findings

DISCUSSION

This paper examined voluntary turnover of employees in a distributed work setting using social network perspective. We proposed that given the nature of talent mobility in contemporary labor markets, individuals' decisions to stay with or quit the firm are influenced by the extent of quitters in their project affiliation networks. Those with greater connections to defectors will quit the firm. Further, we suggested that the influence on such focal individuals will be higher when they are collocated and occupy similar professional roles as the affiliated quitters. We specified that this relationship will be moderated by firm tenure of employees. We find empirical evidence to support these hypotheses.

	Structurally similar	Same career decision
Structurally similar	1	
Same career decision	0.03*	1
*With 5000 permutations		

Table 5: Quadratic Assignment Procedure Correlation

*Table presents the relationship between the structural similarity of each pair of actors (i.e., individuals with similar patterns of ties to third parties have a corresponding value close to 1) and the career similarity of each pair of actors (e.g., $x_{ij} = 1$ if both individuals quit the firm or if both individuals stayed, and $x_{ij} = 0$ if one individual quit and the other stayed)

Existing research on networks and turnover proposes that embeddedness established through ties (or lack of ties) with other employees is a key reason why individuals choose to stay with or leave a firm [21, 44]. Our findings suggest that employee ties also serve as important reference points to provide clarity and cues of next career moves. To the extent that objective physical bases for evaluation are not available, subjectively accurate assessments of one's ability depend upon on how one compares with other person [22]. This suggests employees are purposefully alert and actively seek signals from colleagues to assess themselves as they join and leave the network. When success is defined in subjective metrics, the moves and opportunities of others become especially important.

Our findings highlight that spatial proximity assumes salience in the diffusion of quit decisions among employees in geographically distributed teams. The proximity to defectors and increased opportunities for interactions with them appears to influence the quit decisions of collocated employees more than those who work in distant offices. The findings also suggest that role similarity serve as important referent points for employees to make quit decisions. People who occupy similar professional roles are likely to share similar values, attitudes and experiences and thus, the career decisions of such similar professionals become strong

signals for focal individuals to pursue outside opportunities.

We acknowledge that the networks analyzed in this study are based on project affiliation information and not direct interpersonal social relations. However, scholars [20] suggest that individuals whose activities are organized around the same focus (e.g., project teams, workplaces, family, etc.) frequently become interpersonally connected over time. This is similar to Atkin's distinction of "backcloth" and "traffic" [3] and Breiger's [9] discussion of the duality of persons and groups. Likewise, affiliations are often used as a proxy for large-scale social relationship data that might be difficult to collect [7]. The significant patterns of our findings based on such ties, which are arguably 'weaker' than direct influence ties, provide us with even greater confidence in our proposed theoretical mechanism.

IMPLICATIONS

This study updates current theoretical understanding of voluntary turnover in general and more specifically, it explains the relational dynamics and the role of spatial propinquity and role similarity in shaping quit decisions of employees in geographically distributed organizations. We extend the current research [21, 37, 44] in the employee turnover area by proposing that social comparison processes are especially pertinent in boundaryless careers and the decisions of coworkers influence an individual's career decisions.

Rather than seeking belonging and viability with others, our findings suggest that individuals are actively searching for cues among their network of colleagues for signals that provide subjective evaluations of career success. In a distributed work setting, spatial proximity allows the flow of such signals and professional role similarity serve as referent points for those cues. Collectively they influence the career mobility decisions of employees.

Our findings engage directly with the complexities of new world of work and have important implications for managers in distributed organizations. Team-based organization of work, geographically and culturally diverse team members, transient team memberships and higher levels of coordination requirements between members are salient characteristics of this new order at work. In such circumstances, employee quit decisions are likely to be influenced heavily by their workplace networks.

Unpacking those networks in a rigorous manner can provide two distinct advantages to managers in distributed organizations: (a) accurate detection of employees who are most likely to quit and (b) robust estimates of the likelihood of subsequent departures given the quit decision of an employee. Such insights will allow managers to take timely and appropriate actions to avoid

the loss of valuable employees as well as manage and staff project teams in a manner that make them less vulnerable to diffusion effects of turnover.

In addition, our study methodology can be integrated with existing enterprise systems and scaled across large organizations. This implies that such insights can be derived passively and consistently in a real or near-real time fashion by intelligent computations of people and project related information that are already recorded for various purposes.

CONCLUSION

Organizations are increasingly relying on various forms of distributed work. For instance, in remote work, individuals work off-site from their employers [5] and in outsourcing and cross-organizational production or development tasks that were earlier considered as key internal activities are instead entrusted to dedicated suppliers [55]. When organizations distribute work across multiple locations, the ability of members to communicate and coordinate across the locations becomes a key source of success.

It is therefore not surprising to note that much of the research in distributed work context is focused around advancing the understanding of various social, behavioral and technological issues to improve team effectiveness in such settings. The network literature has made important contribution to this area. For instance, scholars have found that individuals tend to build ties toward information necessary for their work [42], but rely heavily on pre-existing ties for information, and often prefer to gain the needed knowledge indirectly through existing ties, rather than by establishing new ties [23].

In this paper, we took a different path and explored the role of networks in employee turnover decisions. We argued that ties to those who quit the firm can motivate subsequent quit decisions. We also postulated that when greater number of teammates in same office location quit the firm and more importantly, when they hold similar professional roles, the likelihood of an individual to follow the suit become higher. We found evidence to these arguments. Our study updates extant network research on employee turnover by specifying that in addition to ties to defectors in project affiliation networks, proximity to and role similarity with them increase the social pressure on focal individuals and trump their sense of connection with the organization.

The analysis of project affiliations used in this study can be integrated with enterprise wide workforce analytics program to create valuable and timely insights for managers while staffing people and designing interventions to ensure project success and addressing employee turnover.

The findings of this study will have special relevance for knowledge-intensive and distributed organizations that operate in highly competitive environments. Highly skilled members of such organizations are often short in supply and drawn from a highly mobile labor market. For instance, IT professionals are found to be moving across organizations, not bound to a single employer [34, 47], and moving across occupations not bound to the IT profession [51, 52]. In such contexts, networks can not only transmit work related information but also career movement signals.

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