

Influences of Peers, Friends, and Managers on Employee Engagement

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ABSTRACT

Employee engagement is a reflection of an employee's experience of work. Previous research has analyzed each employee's experience in terms of individual factors. We provide the first report of the influence on engagement of peers (who report to the same manager) and friends (who share social ties in an internal social network), using linear regression to model employee engagement in a sample of more than 44,000 employees. We show that an employee's engagement is associated with the engagement of her/his peers, friends, and manager. Our results contribute to analyses of social factors at work, and argue for revisions to existing theories of employee engagement.

Keywords

Employee engagement; Social ties; Social network; Organization; Organization structure.

1. INTRODUCTION

The experience of work has been a core aspect of research in GROUP and CSCW [4, 40, 41]. One measure of the experience of work is the concept of employee engagement [1, 3, 6, 8, 15, 18, 36, 37, 39]. Employee engagement is also an important topic in management studies [1, 36, 47], including its positive association with employee well-being, employee helpful behaviors [15] and performance [32, 33], business success [21] and advice to managers [11, 25] and executives [50, 52], as well as more theoretical discussions in organizational studies [6, 8, 12, 15, 37, 43], and has recently gained attention in CHI, CSCW, and related research as a summary metric of employees' experiences at work and in organizations [39, 44, 45, 46].

Most accounts of employee engagement emphasize the roles of executives [50, 52, 53] and managers [11, 25] in shaping and enhancing engagement of their direct reports – a model that we refer to as the “vertical stack” (Figure 1A). By contrast, Avery et al. reported that “satisfaction with coworkers” is associated with higher engagement [3]. Guha et al. opened a discussion of the importance of employees' social network position (centrality) as a contributing factor of engagement [16]. In this note, we go further, to show mutual influences on employee engagement from the employee's peers (who report to the same manager) and the

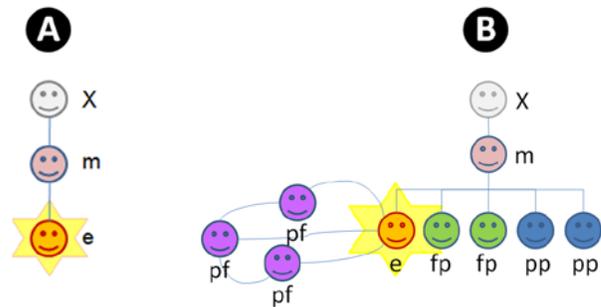


Figure 1. Approaches to employee engagement.

- A. Vertical stack model, emphasizing the role of Executive, X, and Manager, m, on the engagement of the employee, e.**
B. Proposed social model, including additional influences by friends, pf, and peers, pp, and hybrid friends-peers, fp.

employee's friends (in an Intranet social network), as well as the employee's manager. Our approach brings together the literature on employee engagement with the literature on social ties in organizations, and argues for a more social view of employee engagement (Figure 1B), and of the theories and measurements in the study of employee engagement.

In the remainder of this note, we provide background, introduce the datasets, and show that influences on engagement by peers and social-network friends are stronger than the influence of managers. We conclude with implications for engagement theory and organizations.

2. Background

While the definition of employee engagement may seem intuitively obvious, there are multiple ways to measure engagement, and each has its own theory behind it. Space does not permit an exploration of these concepts – we recommend [1, 6, 8, 37, 38] and especially [42] for a broader discussion. In general, all definitions involve a positive attitude toward work and the workplace, and many measure of engagement have been associated with practical value to organizations [1, 11, 15, 17, 32, 33, 36]. We hope that recent interest among CHI and CSCW researchers [10, 16, 26, 44, 45] will add to the precision, conceptual richness, and empirical evidence regarding employee engagement.

In this note, we attempt to relate measurements of employee engagement (as summarized above) with the literature on the importance of social ties in organizations [2, 5, 9, 19, 22, 27, 28, 30, 35, 48, 54, 56]. The Utrecht Work Engagement Scale is based on resistance to burnout at work, and consists of three factors: vigor, dedication, and absorption [39]. The Job Engagement Scale includes three different factors: physical, cognitive, and emotional

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Table 1. Sources of data, and descriptive statistics, for employees in the datasets.

Data Source	Measurement	N in original dataset	Data Attribute	Range in Sample
Survey	EngagementMean	190,469	Score, 1.0-5.0	1-5
Organization Chart	Manager	130,727	Count of people	1
	Peer	188,906	Count of people	1-453
SNS	Friendship	122,405	Count of people	2-5,488

engagement [18, 33]. Neither of these influential measurement approaches involves social concepts.

Among commercial measures, the Kenexa High Performance Engagement Model considers pride, satisfaction, advocacy (recommendation of the workplace to job-seekers), and retention [53]. Again, social factors are absent. The Gallup “G12” survey includes a single question (among 12) about having a friend at work [18]. These commercial surveys reflect the trend in the business, management, and organizational literatures to emphasize the importance of executive strategies [50, 52], managerial influences [11, 25], and workplace conditions that are under the control of executives and managers [8, 44, 50].

We wanted to know if social factors were also predictive of engagement, as suggested by the research literature on the importance of social ties at work [2, 5, 9, 19, 22, 27, 28, 30, 35, 48, 54, 56]. We collected datasets (described below) that consisted of hierarchical ties (derived from an organizational chart) and social ties (derived from an Intranet social network service). Our first research hypothesis was simply:

RH1. Employee engagement is influenced by people to whom the employee has ties.

Our dataset allowed us to consider several types of social ties (Figure 1B). The research literature has emphasized the importance of management in influencing employee engagement [11, 25] – i.e., the vertical stack of Figure 1A. Therefore, we might predict:

RH2a. Employee engagement is influenced more by ties with managers than by other ties.

However, peers may also impact an employee’s experience at work [29]. Therefore, we also consider:

RH2b. Employee engagement is influenced more by ties with peers than by other ties.

There is a large research literature that has shown the importance of friendship social ties in the workplace [2, 5, 9, 19, 22, 34, 35, 54, 56]. Therefore, we also might find that:

RH2c. Employee engagement is influenced more by ties with friends than by other ties.

Finally, it is possible that an employee might be friends with a peer co-worker [31, 38]. The category of hybrid friends-peers may represent stronger links, because employees are connected via two types of social ties (peer-ties and friend-ties). Earlier research, using faceted social identity theory, has found stronger results for pairs of people who shared multiple identity facets ([27]; however, see [23, 35] for potential limitations). Therefore, we examine:

RH2d. Employee engagement is influenced most by ties with hybrid friends-peers.

3. Datasets and Method

The study took place in IBM, a large multinational corporation that focuses on technology and services in many countries. IBM has a conventional, hierarchical organization structure. IBM also encourages active use of internal social media similar to [7, 20, 22, 23, 54, 55]. We draw upon data from these two organizational (network) structures for the year 2015.

IBM conducts an annual, voluntary employee engagement survey, using a modified form of the engagement items in the Kenexa High Performance Engagement Model [53]. This survey uses three Likert-style questions (range 1-5, with 5 as highest score), and focuses on pride in working at IBM, the work experience in IBM, and recommendation of IBM as a good place to work. For this note, our data were drawn from the November 2015 survey.

3.1 Sources of Data

For these analyses, we combined anonymized data from the following sources:

- **Employee engagement survey.** We examined the mean score from the survey, which we called **EngagementMean**. The mean had a range of 1-5, with 5 as the highest engagement.
- **Hierarchical organization chart.** We reduced the hierarchical organization chart into a set of links between managers and their direct reports (employees). From these we derived a manager-link for each employee, and also peer-links, which we defined as employees who report to the same manager.
- **Friendship social ties.** Finally, we collected the set of friendship ties (“friending” relationships) from IBM Connections Profiles (the IBM internal social network service). Friending relationships begin when one employee initiates a “friend” request to a second employee through the social network service, and are completed when the second employee accepts the request.¹

3.2 Data Preparation: Refinement

It was possible for an employee to be linked to another employee through both a *peer* link and a *friend* link (Figure 1B). To maintain independence among our predictors, we separated each employee’s links into four categories: the employee’s manager (for **RH2a**); the employee’s peers (peers who were not also friends, for **RH2b**); the employee’s friends (friends who were not also peers, for **RH2c**); and the employee’s hybrid “friends-peers” (who were both friends and peers, for **RH2d**). (Throughout this note, we use the word “peer” to mean “peer who is not a friend.”

¹ We thank an anonymous reviewer for pointing out that a “friendship” relationship in a corporate Intranet social network may, not be equivalent to a “friendship” relationship in an Internet social network – or to the conventional offline social definition of friendship.

Table 2. Pearson correlations of influence factors with employee engagement (EngagementMean).

Influence	Correlation	df
Pure peers	.335***	182,147
Pure friends	.241***	116,876
Friends-peers	.280***	61,213
Manager	.175***	129,348

*** p<.001

and we use the word “friend” to mean “friend who is not also a peer.” No employee is double-counted in the three relationship types, peer, friend, or friend-peer.)

3.3 Data Preparation: Aggregation

For each type of relationship for each employee, we computed the mean of engagement scores for all of the people who had the specified relationship with the employee. For the manager relationship, this was trivial, because each employee has only one manager. For the pure peers, we computed the mean of the engagement scores for all of the peers of the employee. We performed similar computations for the pure friends, and also for the friends-peers.

4. Results

Not all employees took the survey, and not all employees participated in the SNS. The dataset of employees who had records in all three source systems (Table 1) contained composite records for 81,538 people.

RH1 asked if ties of any type appeared to influence each employee’s engagement. We first examined this question via simple Pearson correlations. Table 2 shows that those correlations were significant for all types of ties. **RH1** was confirmed.

The set of hypotheses under **RH2** compared the relative strength of relationships across managers, pure peers, and pure friends.² We evaluated these hypotheses via a linear regression fitted to Model 1 (n=44,375):

$$[1] \quad E = \alpha + \beta_{pp}(\text{purepeers}) + \beta_{pf}(\text{purefriends}) + \beta_m(\text{manager}) + \beta_{fp}(\text{friendspeers}) + \varepsilon$$

However, 130,778 employees had no hybrid friends-peers. Because they had missing data for friends-peers, their records dropped out of the analysis for Model 1. Therefore, we also tested a simpler Model 2 that omitted any tie that was both peer and friend (n=81,538):

$$[2] \quad E = \alpha + \beta_{pp}(\text{purepeers}) + \beta_{pf}(\text{purefriends}) + \beta_m(\text{manager}) + \varepsilon$$

Table 3 summarizes the results of the regressions for both models. All of the influence factors were significant and positive (further confirmation of **RH1**). Because the range of values of the influence factors was the same (1-5), we could directly compare the size of the coefficients within each of the four analyses. Figure 2 shows the confidence limits for each. We note that the relative sizes of the coefficients are consistent between Model 1 and

² We also considered models that included the mutual influence of subordinates upon a manager. However, those models excluded any employee who had no direct reports, thus harshly decreasing the sample size to fewer than 3000 managers. For this note, we omit the “subordinates” term in order to expand the sample sizes as reported for Models 1 and 2, respectively.

Table 3. Regression coefficients for Model 1 and Model 2.

	Model 1 (including friends-peers)	Model 2 (excluding friends-peers)
Influence	Regression Coefficient (β)	Regression Coefficient (β)
Adjusted R-Square	.158***	.140***
n	44,375	81,538
Pure peers	+.365***	+.429***
Pure friends	+.199***	+.244***
Friendspeers	+.175***	-
Manager	+.045***	+.061***

*** p<.001

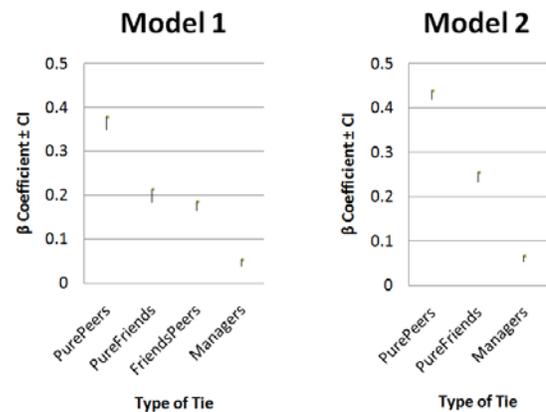


Figure 2. 95% Confidence intervals for regression coefficients in Model 1 and Model 2.

Model 2, and are broadly consistent with the correlation coefficients in Table 2 (with the exception of hybrid friends-peers). Each coefficient is significantly different from all other coefficients within its analysis – again with the exception of a slight overlap between purefriends and friends-peers in Model 1.

These relationships allow us to confirm **RH2c** (pure peers are most influential), followed by a weaker version of **RH2b** (pure friends). The supports for **RH2a** (manager) and **RH2d** (friends-peers), while significant in each case, are weakest.

Based on [27], we had hypothesized the impact of friend-relation + peer-relation to be additive. In these data, it may be that this hybrid category was more of a confused combination of two different influences, rather than a fusion of two influences into a single omnibus influence. The noisiness of the combination of influences may have reduced the predictive power for the hybrid friends-peers factor.

5. Discussion

Because our datasets had only partial overlap, we tested our more detailed research hypotheses three different ways:

- **Correlations** (Table 2), whose *pairwise* restrictions included the largest amount of the data
- **Exhaustive regression** (Table 3, Model 1), whose restrictions excluded any employee who had no friends-peers ties

- **Relaxed regression** (Table 3, Model 2), which included the larger set of employees with at least survey, manager, peer, and friend data.

The pattern of results across the three analyses is consistent in many aspects. Pure peers have the strongest relationship to Engagement. Pure friends have the next strongest relationship, but are significantly weaker than pure peers. Managers have the weakest relationship. The only exception to these general agreements was in the hybrid category of Friends Peers, which may have been a higher-variance combination of multiple types of relationships. All relationships are highly significant. Thus, the question is not to choose which relationship to measure, but rather how to measure their different, independent contributions to employee engagement.

5.1 Implications for Engagement Theory

Our results provide evidence that social factors may influence employee engagement (**RH1**), and that co-workers (peers) and Intranet friends are the more important of those factors (**RH2b** and **RH2c**, respectively), and are – notably – more important than managers (**RH2a**). This note provides an initial indication that theories and metrics of employee engagement [8, 18, 33, 39, 53] should be re-examined. The conventional vertical stack model of Figure 1A does not include the horizontal relationships with peers and friends (Figure 1B). Our analyses suggest that these relationships are also important factors in employee engagement. More broadly, our results suggest that executives and managers, while important, are not the only contributing factors to employees' engagement. Engagement depends not only on management, but also on peers and friends matter, who may in fact matter *more* than managers.

Nonetheless, managers must exercise some influence on engagement. First, as we reported for **RH2a**, managers do have a weaker but significant influence. Second, managers set the tone for a group of collaborating workers – i.e., for each employee and her/his peers. In this way, the strength of the peer influence or **RH2b** may be an indirect indicator of the workplace tone set by the manager.

5.2 Implications for Theories of Social Ties

These results help to link analysis of social ties (based in part on social media) to employees' experiences of work [4, 40, 41], through an important business metric (see also [2, 9, 19, 21, 28, 56]). In a convergent study, Guha et al. showed that an employee's position in an employee social network may also be predictive of engagement [16]. It will be interesting to compare this note's simple models of social influence, with more complex models that weight the social influence according to network position or homophily, or with other aspects of friendship [18] or affiliation [3].

While different types of homophily facets or social ties may operate similarly [27], these different types of ties may not be equally effective or informative [14, 51]. Our results are consistent with these findings, showing differential effectiveness (**RH2a-d**). In future work, we hope to explore the strength of additional types of ties, such as reply-to links in online discussion groups, or co-membership in online communities. It may be useful to theorize the relative strengths of these different types of workplace ties.

5.3 Implications for Organizations

The use of engagement measures in organizations is becoming an important measure of organizational "health" [1, 11, 17, 18, 21,

32, 52]. Our results have shown that social network factors may influence this type of measure, including online friendships that span geographic boundaries among co-workers in multinational corporations. Organizations may wish to explore whether support for peer- and friend- networking may improve employees' experience of work and the organization (e.g., [3]), and may provide means for sensing changes in employee engagement and perhaps additional channels for increasing engagement through social, mutual support.

Results of an engagement measurement survey may be used to guide actions to improve engagement among employee segments with low engagement scores. Traditionally, such action planning has been conducted with managers as the focal point [11, 25]. Our research suggests that the vertical stack model with the hierarchical top down approach to employee engagement may not be the only way to focus on improving engagement [16]. A more social model shifts the responsibility for improving engagement from the manager alone to all employees. In the long run, the social model may have a higher probability of success in improving engagement than relying on the manager alone. Future research will investigate how effective efforts of improving engagement through peer and friend relationships are.

There is a saying that people join companies but leave managers. Social support from peers and friends may alleviate the effect of poor managers. In organizations following the vertical stack model, engagement is only as strong as the weakest manager. For organizations struggling with retaining key talent because of poor management leadership, social support from peers and friends may impact whether an employee decides to stay or leave. More work is needed to determine the efficacy of peer and friend relationships in improving retention in situations where a manager may be providing poor leadership in the eyes of his or her employees.

5.4 Limitations

We reported on a large-scale hybrid network in IBM, a company that strongly supports doing work through internal social media. Further research is needed to see if these results replicate in other organizations, and/or in organizations that place less emphasis on internal social media.

We note that a majority of the IBM employees lacked survey data or friendship data, and thus limited the sample size. As organizations mature in their use of enterprise social networks, we expect that the coverage of this kind of analysis will increase.

While we have presented our results in terms of influence on an employee by her/his social ties, the relationship is of course bi-directional. The survey data were collected simultaneously. Therefore, although we have written in the language of causal models (e.g., "influence"), a more complete description may need to speak of "mutual influence" and "associations" in place of causal models.

We also note that the formal and observable social ties in our analysis may not correspond to individual employees' views of their own personal social worlds. Asking this number of employees to list their social ties would have disrupted the work of a substantial proportion of the organization. Therefore, we used the formal and observable ties as an approximation of people's experienced social ties.

Finally we acknowledge that there are many definitions and metrics of employee engagement [8, 18, 33, 39, 53]. More research will be needed to determine if these other measures and metrics show the same patterns of social influences.

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