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## Survey of Social Factors of Construction Workers' Absence Behavior

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**Abstract:** Absenteeism, defined as not showing up for a schedule, is particularly problematic within the construction industry where intact crews are needed to complete assigned work. Not only does workers' absenteeism adversely affect the reliability of manpower supply in projects, but it can increase safety risks, and potentially damage the schedule and the cost of the entire project. Although numerous studies have been conducted to identify the various causes of individual absence, it isn't exactly clear whether decisions to be absent from work are motivated by personal factors or by forces within the social-job context in which these decisions are made. In this study we examined the behavior of individual within tunneling crews. Specifically, we examined whether perceptions of several team characteristics (cohesion, communication/cooperation, and support) accounted for variance in attendance behavior. We also looked at performance in terms of overall effectiveness. The data came from 70 labourers who worked in 10 tunneling crews, as well as the tunneling project manager. Crew members provided ratings on the three team characteristics, and the project manager provided data on each crew members' attendance level over the previous year, and on their overall effectiveness. Our findings revealed that team process variables explained 16% and 19% of the variance in attendance and overall effectiveness ratings, respectively. Our findings highlighted the importance of strengthening the degree of cohesion and communication within tunneling crews, as well as fortifying team support. Implications for attendance control are discussed.

### 1 Introduction

#### 1.1 Importance of construction workers' attendance in construction

Due to the labour intensive nature of construction projects, construction workers' consistent and timely attendance is an indispensable condition for successful construction projects. If a construction worker is absent, other members in his/her workgroup (i.e. crew) usually have to expend more energy compensating for the missing manpower. If not successfully covered by the other crew members, the missing role will reduce the productivity of the crew, and in turn, the reduced productivity can result in schedule delays of the entire project. Even if the missing role is effectively covered by other crew members' extra contributions, it can increase safety risks because workers are exposed to increased likelihoods of accidents when they work under schedule pressure or when they work with inexperienced team members. In addition, indirect impacts, such as reduced morale among crew members, may ensue, which may not be visible but significantly affect workers' performance.

Absenteeism is defined as the failure to report for work as scheduled (Johns 2008). Several researchers have pointed out that construction workers' absenteeism is one of the factors of productivity loss in

construction projects (Hanna et al. 2005). Hanna et al. (2005) found that when absence rate was between 0% and 5%, productivity increased by 2.8%; whereas when absence rate was between 6% and 10%, productivity decreased by 24.4%. More recently, large-scale industrial projects in Alberta, Canada suffered from productivity loss caused by high absence rates of workers (Sichani et al. 2011).

## **1.2 Perspectives on construction workers' absenteeism**

Several researchers have studied causes of construction workers' absenteeism. Hanna and his colleagues (2005) surveyed construction managers and workers' perception on the causes of absenteeism. In this survey, it was revealed that managers think workers are absent at work mainly because of personal and family illness, reluctance to work, doctor/dental appointments, drug or alcohol, etc, whereas construction workers attribute their absenteeism to more of the inevitable conditions, such as injury, bad weather, unsafe working conditions, etc. This survey result shows the disjuncture between manager's view and workers' view to absenteeism. Sichani and his colleagues (2011) also surveyed the causes of workers' absenteeism at large-scale industrial project sites where high absence rates caused productivity loss. In their survey, the top five causes of absence were personal illness/injury, personal appointment, bad weather, already planned time off, and other family responsibilities. Although these survey results identify the documentable, direct causes of construction workers' absence, it may be difficult to generalize these causes. This is because the absence causes revealed by the surveys may reflect unique environments and job site conditions of each project. With an awareness of this weakness of surveys, some researchers have attempted to reveal the underlying causes (e.g., behavior control mechanism) of construction workers' absence behavior using simulation (Ahn et al. 2013).

Historically, absence researchers have tended to focus on predictors such as job satisfaction, attendance motivation, physical ability to attend and a host of personal characteristics (Steers and Rhodes 1978). More recently, researchers have focused attention on the social context in which the daily decisions to attend or be absent are made (Johns, 2008). Much attention has been directed towards understanding the effects of a group's absence culture on individual behavior. Absence culture has been understood to reflect the set of shared understandings about absence legitimacy in a given organization and the established 'custom and practice' of employee absence behavior and its control (Johns & Nicholson, 1982). What isn't as clear are the factors that contribute to a team's absence culture, or the factors that determine whether individuals align their behavior with other team members (for a discussion of group effects on individual absence, see Gellatly & Allen, 2012). Xie and Johns (2000) identified group cohesion as a team characteristic that determined whether or not individuals tracked the absence behavior of other members. It follows that other team characteristics, especially those that strengthen or fortify bonds within individual members might also play a role.

## **2 Objective and Scope**

With this background in mind, the objective of this survey is to investigate the extent to which perceived team characteristics predicted variance in attendance behavior. We focused on three contextual determinants that would vary within construction crews, namely, cohesion, communication/cooperation, and support, and examined the extent to which these accounted for variance in attendance (and performance).

## **3 Method**

### **3.1 Sample and procedure**

We surveyed tunnelling crews who were working at various sewer tunnelling sites. The survey items were administered via one-on-one interviews (each survey question was presented orally; interviewees were then shown the response scale and asked to use it to express their opinion; then interviewers recorded the response). In total, 70 labourers who worked in 10 tunneling crews were interviewed. Next, we collected absenteeism and performance ratings from the general supervisor. This individual was selected

because s/he knew everyone very well, had ample opportunity to observe over the target period, and was aware of their personnel statistics.

### **3.2 Measures**

We measured team cohesion using 3 items that were adapted from a scale developed by Carron, Widmeyer, and Brawley (1985). The three items were as follows: In general, my team members get along well with each other; My team members like each other; and The members of my crew really stick together, especially when things get tough. For each item, respondents indicated their agreement or disagreement by selecting a score on a 7-point scale (1 = strongly disagree; 2 = disagree; 3 = slightly disagree; 4 = neither disagree nor agree; 5 = slightly agree; 6 = agree; 7 = strongly agree). Item responses were averaged to produce an average cohesion score for each individual. Across the entire sample, the average cohesion score was 6.21 (indicating a high level of cohesion within the teams). The reliability of the team cohesion scale was .77 (coefficient alpha).

Communication and cooperation was measured by adapting a 3-item scale developed by Campion, Medsker, and Higgs (1993). The three items were as follows: Team members are very willing to share information with each other about our work; When it comes to getting the work done, members of my crew communicate well; and Members of my crew cooperate with each other to get the work done. Respondents indicated their agreement or disagreement by selecting a score on a 7-point scale (1 = strongly disagree;..., 7 = strongly agree). Item responses were averaged to produce an average communication and cooperation score for each individual. Across the entire sample, the average score on this characteristic was 6.21. The reliability of the communication and cooperation scale was .65 (coefficient alpha).

Team support was measured by adapting a 3-item scale developed by Campion, Medsker, and Higgs (1993). The three items were as follows: Working in a team allows me to provide support to other members; Working in a team increases my opportunities for positive social interactions; and Members of my team help each other out at work when needed. Respondents indicated their agreement or disagreement by selecting a score on a 7-point scale (1 = strongly disagree;..., 7 = strongly agree). Item responses were averaged to produce an average team support score for each individual. Across the entire sample, the average score was 6.25. The reliability of the team support scale was .69 (coefficient alpha).

We used the Relative Percentile Method (RPM) to structure the attendance and performance ratings (see a sample form in Appendix 1). The accuracy and validity of the RPM has been demonstrated in previous research (e.g., Goffin, Gellatly, Paunonen, Jackson, & Meyer, 1996; Goffin, Jelley, Powell, & Johnston, 2009). This approach resulted in a rating within the 0-100 range for attendance and overall effectiveness. Using this scale, the supervisor rated each individual with their respective crew. Two RPM ratings were made for each crew member, one for attendance relative to other members of the tunneling team, and one for overall effectiveness relative to other members of the tunneling team. The average ratings for the attendance and overall effectiveness measures were 73.10 and 72.03, respectively.

## **4 Results**

Means, standard deviations and correlations among our study measures are displayed in Table 1. As expected, we observed modest positive correlations among the three team characteristic measures. Both outcome measures (attendance and overall effectiveness) were positively correlated with the team characteristics, except the correlation between team cohesion and attendance did not reach statistical significance.

Table 1: Descriptive Statistics—Means, Standard Deviations, and Correlations

Measures	<i>M</i>	<i>SD</i>	Measures					
			1	2	3	4	5	
1. Perceived Team Cohesion	6.21	0.65	1.00					
2. Perceived Communication and Cooperation	6.21	0.68	<b>0.46</b>	1.00				
3. Perceived Team Support	6.25	0.65	<b>0.39</b>	<b>0.43</b>	1.00			
4. Attendance	73.10	15.44	0.12	<b>0.37</b>	<b>0.29</b>	1.00		
5. Overall Effectiveness	72.03	15.36	<b>0.21</b>	<b>0.37</b>	<b>0.37</b>	<b>0.68</b>	1.00	

Note. *N*=70; *M*=Mean, *SD*=Standard Deviation. Correlation in bold type are significant ( $p < .05$ ; 1-tail test).

To assess the extent to which variance in our two outcome measures was explained by perceived team characteristics, we conducted two regression analyses using attendance and overall effectiveness, respectively, as the criterion. The results of the regression analyses are presented in Tables 2 and 3. We can see from Table 2 that the set of context variables explained a significant amount of variance in attendance behaviour ( $R^2 = .16$ ,  $F(3, 66) = 4.33$ ,  $p < .01$ ). However, an inspection of the regression coefficients revealed that only communication and cooperation exerted a significant effect on attendance behaviour.

Table 2: Regression Analysis (Attendance)

Predictor Variables	<i>beta</i>	<i>t</i>	<i>p</i> <
Perceived Team Cohesion	-0.10	-0.78	ns
Perceived Communication and Cooperation	0.33	2.50	0.02
Perceived Team Support	0.19	1.46	ns
$R = .41$ $R^2 = .16$ $F(3,66) = 4.33, p < .01$			

Note. *ns*= not significantly different from zero

Likewise, we can see from Table 3 that the set of context variables explained a significant amount of variance in overall effectiveness ( $R^2 = .19$ ,  $F(3, 66) = 5.18$ ,  $p < .01$ ). An inspection of the regression coefficients revealed that both communication/cooperation and team support exerted significant effects on overall effectiveness.

Table 3: Regression Analysis (Overall Effectiveness)

Predictor Variables	<i>beta</i>	<i>t</i>	<i>p</i> <
Perceived Team Cohesion	-0.10	-0.05	ns
Perceived Communication and Cooperation	0.26	2.02	0.05
Perceived Team Support	0.25	2.02	0.05
R = .44			
R <sup>2</sup> = .19			
F(3,66) = 5.18, <i>p</i> < .01			

Note. ns= not significantly different from zero

## 5 Discussion and Conclusion

Expectedly, the two supervisor-ratings—attendance and overall effectiveness—are strongly and positively correlated. This is the evidence that the workers who timely attend the job site also tend to perform well in their operation. Interestingly, both outcomes were predicted by the nature of experiences within the team, namely the degree to which members effectively communicate and demonstrate cooperation and support. Although 16% and 19% of variance in attendance and overall effectiveness, respectively, may seem modest, we would argue that aggregated across hundreds of workers on a typical construction site, the cost of poorly functioning teams (or the benefits of effective teams) can be quite large. These findings suggest a new way of thinking about attendance management. Rather than focusing on formal attendance control policies – they do have their place – these findings suggest that construction managers need to pay attention to the culture at their project, and, in particular, the social dynamics within work crews. It would seem that even a modest investment in team work training may pay off in terms of increased attendance and performance. This is especially true for crews who perform highly interdependent work (as we see in tunneling crews). Further research efforts should extend this work and examine a broader range of social context factors that either shape an absence culture or affect the extent to which individuals willingly track the behavior of their crew members.

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#### **Appendix I: Example of Behavior Rating Sheet (Names are fictitious)**

