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Norms and Their Relationship to Behavior in Worksite Settings: An Application of the Jackson Return Potential Model

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Objectives: To measure health norms and assess their influence on behavior among 2541 employees in 16 manufacturing worksites using an adapted Jackson's Return Potential Model (RPM). Methods: Worksite-level norm intensity, crystallization, and normative power were calculated for several behaviors; linear regression analyses tested whether normative power was related to each health behavior. Results: Norms about safe work practices and smoking were most intense; norms about safe work practices were most crystallized. Safe work practices and smoking held the highest normative power; healthy eating held the least normative power. Conclusions: Comparing norm characteristics across health behaviors leads to important leverage points for intervening to influence norms and improve worker health.

Key words: health norms, worksite health, health promotion, occupational health

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Health promotion programs offered at work have increasingly taken on an ecological orientation, and greater attention to the contextual influences on worker health is critically needed not only as a means of understanding how to best maximize intervention effectiveness but also as important determinants of worker health in their own right.

Norms about health at work represent one potentially important, yet understudied contextual influence on employee health. Norms can be characterized as standards, models, or patterns regarded as typical for a specific group and are often considered among the least visible and yet most powerful forms of social control over human action. Norms are also considered “standards against which the person can evaluate the appropriateness of behavior...providing order and meaning to what otherwise might be seen as an ambiguous, uncertain, or perhaps threatening situation.” Handel argues that norms are specific to the situation and to...
the people who interact within a particular situation. Although a number of studies have emphasized the importance of health-related norms and their impact on health behavior, the measurement of health-related norms at work has received very little attention in the published literature.

Sorensen et al^ found significant variation in attitudes and norms about smoking at the worksite level among employees within 10 different worksites. Norms about smoking were assessed with 4 questions directed at coworker support during quit attempts, coworker discouragement during quit attempts, perceived prevalence of smoking among coworkers, and worker attitudes about smoking. Results suggested that worksite smoking cessation interventions must not only attempt to engage coworker support for quit attempts, but also help smokers deal with coworker discouragement and other negative norms about smoking at work.

Perry et al^ considered knowledge, beliefs, norms, and intentions of farm workers regarding hazardous pesticide handling behaviors in Wisconsin. They found that norms about use of personal protective equipment (PPE) for handling hazardous pesticides were independent of individual knowledge about how to use PPE. Maierhofer et al^ examined the effect of manager and employee organizational values on safe work practices in the hairdressing industry and determined that manager values and behavior played a significant role in safe work practices used by employees, but found no association between descriptive norms (eg, defined as what people do in the workplace/what is considered normal) and value congruence associated with safe work practices. Interestingly, the value that managers placed on time urgency was related both to employee value of time urgency and (negatively) to their safety behavior. Thus, a more detailed descriptive measure of behavioral norms may prove useful in understanding the mechanisms that link values-norms-behaviors over time within a particular work setting.

Typically, most studies assessing health norms at work have utilized single-item measures and have not tried to evaluate intervention-related norm changes over time. Second, there are no universally accepted measures of norms so that it is nearly impossible to compare norms across health behaviors, within/between settings, or within/between different studies. Third, existing norm measures do not clarify unique structural characteristics that a particular norm might exhibit. For example, one might want to quantify how strongly or how embedded a particular norm might be in a given group or worksite. Overly simplistic attempts to measure norms will not yield enough detail to help build intervention strategies for influencing norms, and will lack the specificity of understanding norms relative to normative processes and their influences on behavior. As a result, multidimensional measures that can be consistently applied to help quantify and characterize the structure of health-related norms would make a valuable contribution to the understanding of contextual influences on worker health behaviors.

Jackson'^ constructed a model to both analyze and measure group norms that may overcome some of these current norm measurement limitations. Jackson's^ Return Potential Model (RPM) defines group norms in terms of the distribution of group member's approval and disapproval for a range of possible actions/behaviors that might be taken by a subject in a particular situation. The behavioral component exists because a norm is always about something (eg, a behavior, attitude, or tendency to act) that is considered to be appropriate or inappropriate. A specification of the amount or quality of behavior expected is key. Jackson's model places acts or behaviors on a continuum. For example, a norm may exist about brushing one's teeth, but how much teeth brushing is appropriate? Either too much (brushing teeth 10 times a day) or too little (brushing teeth once a week) might be disapproved. Therefore, Jackson's model assumes that the teeth-brushing act can be measured on a range that includes degrees of behavior using either quantitative or qualitative scales. The evaluative component of a norm refers to shared tendencies to either approve or disapprove of acts along a particular behavioral dimension. For example, once-a-day teeth-brushing would be identified on the behavioral dimension, and a complete range of evaluations (high to low approval) would exist for once-a-day teeth-brushing; and, 3-times-a-day, once-a-week, twice-a-
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week, etc, teeth-brushing behavior could be evaluated as well. Therefore, both behavioral and evaluative components are key to Jackson's RPM.

This description of norms is unique because on any given behavioral dimension, the amount of approval or disapproval felt by group members may fall anywhere along the evaluative dimension. As a result, one can plot a curve to describe the feelings of group members for any norm and can quantify various aspects of the curve to measure and describe in quantitative terms different characteristics of norms. However, the curve does not represent the actual behavior occurring in a given group, only the feelings that a group holds about a particular behavior in a particular situation. Jackson first identifies the “point of maximum potential return” or norm, as the highest point on the curve and represents the behavior most endorsed by group members as a whole. For any given behavior, a range of tolerable behavior can be quantified as the part or range along the behavioral dimension that members of a group approve. Behaviors with serious consequences attached to them might have a much narrower range of tolerable behavior than will other behaviors (eg, driving while drunk is likely to have a narrower range of tolerable behavior than would brushing one's teeth less than once per day).

This paper pays special attention to 3 specific norm characteristics quantified using the Jackson measure. Norm intensity refers to points within a behavior range that may confer very high or very low disapproval by a group. Intensity is determined when the peak point is reached (considering points both above and below the point of indifference of the evaluative continuum). Intensity reflects the “steepness” of the curve and/or the overall amount of effect that is associated with a specific norm -- regardless of whether the effect is positive or negative. Driving while drunk might be a more intensely held norm (group members may have very high disapproval ratings) than the intensity of a norm held about brushing teeth only twice per week. Although group members may disapprove of brushing only twice a week, they may not disapprove as strongly; hence the intensity score would be lower from teeth brushing than an intensity score for driving while drunk.

Norm crystallization corresponds to the degree of consensus that a group has about the amount of approval and disapproval associated with each point on the behavior dimension. Because feelings of approval or disapproval may be widely scattered for any given position on the behavioral dimension, crystallization is determined by assessing the amount of variation in members' approval for each behavior summed across all points on the behavioral dimension. The greater the variation, the less crystallized the norm in that group.

Normative power is a third important norm characteristic and is a function of the intensity (amount of approval) and crystallization (consensus about approval) that a group has about a particular behavior. Thus, normative power represents the “potential for influencing activity that is inherent in interpersonal identification or shared orientations.” Similarly, Green states, “Normative power is expected to be related to compliance with the group's wishes.” Thus, normative power is central to Jackson’s conceptualization of norms and is hypothesized to be a key determinant of behavioral action in a group setting, such as a worksite. Norms high on both intensity and crystallization are likely to yield a high level of group conformity. Conversely, norms low on intensity and crystallization are likely to lack group conformity to the norm related to that behavior.

Jackson’s RPM has been used to characterize group norms and to understand the internal dynamics of social systems about a wide range of issues. To our knowledge, this is one of the first published applications of Jackson's RPM to health-related norms generally and the first to examine health-related norms at work. Hackman describes Jackson's RPM as an important tool for use in “diagnosing group norms as a first step in an intervention that seeks to improve group functioning”, and is particularly useful for comparing norms across a range of behaviors both within an organization and across organizations.

The purpose of this paper is to adapt Jackson's RPM to (1) determine norm characteristics (intensity, crystallization, normative power) associated with 4 targeted health behaviors (smoking, eating healthy snacks, use of PPE, and safe work prac-
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(1) examine norms among employees in 16 New England manufacturing worksites; (2) compare and contrast norm characteristics related to each health behavior; and (3) test the hypothesis that normative power is related to health behaviors at the worksite level in order to validate the relevance of the Jackson model in the health-related behavior arena. By exploring a new method of measuring health behavior norms, we expect these results to offer important insights and leverage points for future intervention planning.

METHODS

Setting and Sample

WellWorks-2 was a randomized study to determine whether an intervention integrating health promotion with health protection results in significant increases in smoking cessation and fruit and vegetable consumption, compared to a standard health promotion intervention. The unit of randomization and intervention implementation was the worksite. Dun and Bradstreet listed manufacturing businesses within eastern Massachusetts and a total of 89 worksites were contacted; 41 were determined to be eligible; 17 were recruited and then randomized. Worksite study eligibility criteria included (1) employment of between 400 and 2000 workers, (2) probable use of chemical hazards, and (3) turnover rate less than 20% (to prevent excessive loss to follow-up). In addition, worksites agreed to (1) be randomly assigned to intervention condition (2) allow completion of a brief core survey on work time and to facilitate administration of the supplemental survey, and (3) participate in the occupational health assessment. One site was dropped due to inability to complete employee surveys, leaving 16 sites for this report. The types of manufacturing conducted at the recruited worksites included adhesives, food, technology, jewelry, motor controls, paper products, newspapers, abrasives, automobile parts, and metal fabrication. All workers were eligible to participate in the intervention. Workers were eligible to participate in the surveys if they were noncontractual workers employed on a permanent basis for 15 hours per week or more, and they worked on-site. A total of 9542 workers completed the core survey, 80% of those eligible (Range: 64% to 92%). All respondents to the core survey were divided into 2 strata: current smokers (or quitters within the last 6 months) and nonsmokers. All respondents in the smoking stratum and a random sample of equal size from the nonsmokers received a supplemental survey including the norms questions. Thus, within the larger randomized trial, we did norms-related measurement development work among 2541 workers who completed the supplemental survey (61% response rate, range 45% to 89).

Data Collection

Individual workers completed self-administered surveys in each worksite at baseline. The core survey was administered to all workers and included demographic items, measures of tobacco use, fruit and vegetable consumption, and perceived exposure to occupational hazards. Extensive pretesting of the core and supplemental surveys was conducted to ensure that all the items, including the norm items, were understandable and easy to answer. The core surveys were conducted in group settings during work time or were distributed through company mail or to employee homes.

Two sources of organizational-level data were used in this study. An organizational variables survey included items on smoking and nutrition-related policies. These surveys were administered (one per site) to a single worksite contact person, typically the human resource director. In addition, the occupational safety and health (OSH) program assessment used an instrument adapted from the US Occupational Safety & Health Administration's Program Evaluation Profile. This instrument (one per site) was administered to a single worksite representative, usually the occupational safety and health contact person, and included items assessing management commitment, employee participation, hazard analysis, hazard prevention and control, and education and training, and combined these into a worksite-level score on a 100-point scale.

Health Norm Measures Operationalized

Health norms as characterized in this paper are worksite-level measures. Therefore, individual employee responses concerning each of 4 targeted health behaviors (eg, smoking, eating fruits and vegetables, use of PPE, and safe work
practices) was averaged within each worksite to determine health-related norms measures across 16 worksites. The structural characteristics of norms associated with Jackson's RPM were computed (e.g., crystallization, intensity, and normative power) for each of 4 targeted health behaviors. For each health risk category, respondents were asked how they would feel in each of 3 behavioral scenarios (e.g., assessing 3 points on Jackson's behavioral dimension): (1) someone teases a coworker for practicing the healthy behavior; (2) no one says anything when a coworker practices the healthy behavior; and (3) someone says something encouraging when a coworker practices the healthy behavior. Response categories ranged from strongly disapprove to strongly approve on a 5-point scale (e.g., assessing 5 points on the RPM evaluative dimension). The mean and variance of each item was computed for each worksite. Determining the scenario most "approved" by the group derives the group's norm. For each behavior the worksite norm was scored as "1" if the worksite rate of approval was highest for teasing, "2" if the rate of approval was highest for saying nothing, and "3" if the rate of approval was highest for encouragement.

The intensity of each norm in each worksite was measured as the mean approval score for that norm in that worksite. Intensity was standardized so that "0" indicated neither approval nor disapproval, on average, "-1" indicated strong disapproval, and "+1" indicated strong approval. Crystallization was measured as the absolute value of the intensity minus \(\frac{1}{4}\) of the average variance of the items for that behavior. A lower value of crystallization indicates that the agreement or disagreement with the norm had lower consensus across employees in the worksite (greater variability of opinion), and a higher value indicates greater consensus (less variability of opinion). Normative power is the product of intensity and crystallization. A high value of normative power indicates a consensus of strongly held opinion, whereas a lower value indicates less strongly held opinions with larger variability.

**Health Behavior Measures Operationalized**

All measures were aggregated to the worksite level by averaging the responses of the individual employees. Smoking status was assessed by 2 questions: "Have you ever smoked 100 cigarettes in your life?" and "Are you a cigarette smoker now?" Worksite smoking prevalence was the percentage of respondents who said "yes" to both questions. A 7-item screener assessed individual fruit and vegetable consumption. Responses were converted to servings per day and summed. The average over all employees gave the mean fruit and vegetable consumption for the worksite. Use of PPE was asked in 3 questions about how often the employee wore gloves, protective clothing, and a respirator. Response categories ranged from Never (0) to Always (4). The responses for each employee were summed over the 3 types of PPE and then averaged over the worksite for a mean use of PPE. Whether safe work practices were followed in the employees department was assessed on a 5-point scale from Never (0) to Always (4) and averaged over the employees in a worksite. Due to the small number of worksites we explored only 2 individual-worker demographic characteristics, gender (percent of the respondents who were male) and type of job (percent of the respondents who were paid hourly rather than on salary).

**Data Analysis**

The unit of randomization, intervention, and analysis in this study is the worksite. Employee-level data was aggregated to the level of worksite. We report descriptive statistics on norm characteristics (intensity, crystallization, and normative power) for the 4 target health behaviors, and we applied least-squares regression analysis to assess the variation in the prevalence of selected health behaviors in each worksite as a function of the normative power associated with each behavior. Multivariate analyses included gender and job type prevalence aggregated to the worksite level to test whether these variables moderated the observed relationships between health-related normative power and the prevalence of selected health behaviors.

**RESULTS**

**Worksites Characteristics**

There was an average of 596 respondents per worksite in the 16 worksites: 61% male, 35% salaried, 16% nonwhite,
and 43% with high school education or less. One worksite did not provide organizational-level data; all but one worksite (n=14/15) reported having a smokefree facility; 3 worksites (3/15) had written policies about healthy eating at work; and participating worksites reported a mean OSH Program score of 66.4 out of 100 possible points (range = 38.9-82.0). Four worksites had unions present. Overall, the average smoking prevalence at the 16 worksites was 20%, and the average servings of fruit and vegetables eaten per day were 3.7. The mean use of PPE was 2.5 (eg, this indicates that on average the 3 types of PPE were used “rarely”). The mean associated with safe work practices was 1.8 (eg, this indicates that on average, safe work practices were followed “usually” by employees in these sites).

**Norms Specific to Health Behaviors at Work**

The norm (most approved behavioral response) for each of the target health behaviors was response option 3, (“Someone says something encouraging when a coworker practices the healthy behavior.”) Yet, variation in the endorsement of this response option was noticeable for different health behaviors. For encouraging smokers to make a quit smoking attempt, 87% of respondents approved or strongly approved of this encouragement, whereas 68% approved of this encourage-

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Intensity</th>
<th>Crystallization</th>
<th>Normative Power</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Range</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Smoking</td>
<td>(.58-.72)</td>
<td>.66</td>
<td>.05</td>
</tr>
<tr>
<td>Healthy Snacks</td>
<td>(.37-.51)</td>
<td>.45</td>
<td>.04</td>
</tr>
<tr>
<td>Use of Protective Equipment</td>
<td>(.46-.58)</td>
<td>.51</td>
<td>.04</td>
</tr>
<tr>
<td>Safe Work Practices</td>
<td>(.65-.78)</td>
<td>.73</td>
<td>.04</td>
</tr>
</tbody>
</table>

**Norm Intensity**

The mean approval of the most approved behavioral scenario (eg, norm intensity) presented in Table 1 point out that norms about encouraging coworkers to follow safe work practices and encouraging smokers to make a quit attempt were the most intensely held norms among employees in these worksites. Norms about encouraging coworkers to eat healthy snacks were the least intensely held. When all worksites were considered, the difference between high/low norm intensity scores was quite similar for all 4 behaviors: smoking (.72-.58=.14), use of healthy snacks (.14), safe work practices (.13), and PPE (.12).

**Norm Crystallization**

Mean responses in Table 1 indicate that norms about using of safe work practices and encouraging smoking quit attempts were distinctly more crystallized than were norms about using PPE or eating healthy snacks. Little consensus about eating healthy snacks was found within worksites, and across worksites there was little variation in the crystallization scores observed. Although norms about encouraging smokers to quit were highly
Table 2
Unadjusted Associations Between Health Behavior-related Normative Power and Corresponding Health Behaviors (n=16 worksites)

<table>
<thead>
<tr>
<th>Normative Power</th>
<th>Smoking Prevalence</th>
<th>Mean Fruit and Vegetable Intake</th>
<th>Use of PPE</th>
<th>Safe Work Practices</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( \beta )</td>
<td>se(b)</td>
<td>( P )</td>
<td>( \beta )</td>
</tr>
<tr>
<td>Smoking</td>
<td>-0.60</td>
<td>0.16</td>
<td>0.002</td>
<td>2.91</td>
</tr>
<tr>
<td>Prevalence</td>
<td>-2.47</td>
<td>0.64</td>
<td>0.002</td>
<td></td>
</tr>
</tbody>
</table>

crystallized, these norms also demonstrated the widest range of crystallization scores across the 16 worksites.

**Normative Power**

The table 1 summarizes normative power, or the potential for influencing group behavior inherent about a particular issue or act. Comparing across health behaviors, normative power is strongest for norms about the use of safe work practices, followed by norms about smoking. Use of protective equipment and healthy snacks had relatively low normative power across all 16 worksites and showed the smallest range of scores. As with crystallization scores above, the widest range of normative power scores was observed for norms about smoking.

**Associations Between Behaviorally Specific Normative Power and Reported Health Behaviors**

Regression analyses revealed that smoking-related normative power (unadjusted for gender and job type) was inversely related to smoking prevalence in participating worksites. Thus, worksites with higher levels of smoking-related normative power were associated with lower smoking prevalence. After adjusting for gender and percent salaried, this relationship was no longer statistically significant (\( P=0.16 \), data not shown). A significant inverse association between safe work practice normative power (unadjusted) and the perceived frequency that coworkers followed safe work practices was apparent (eg, negative slope here indicates that as the number of safe work practices goes up [number actually goes down] normative power also goes up). Unlike smoking, when gender and percent of salaried employees were controlled for in the model, this relationship persisted and remained statistically significant (data not shown). Fruit- and-vegetable-related normative power (unadjusted) was not related to actual fruit/vegetable intake in responding worksites, nor was the relationship between PPE-related normative power and the actual reported use of PPE.

Bivariate associations between health behavior-related normative power and selected employee-level characteristics (eg, percent male or percent salaried) were examined to confirm that normative power is not a proxy for other employee characteristics. This analysis is exploratory given the small number of worksites, employee-level variables, and limited power to assess these relationships. However, results reveal that gender is a potential modifier of normative power for smoking; a higher percentage of male employees was associated with having less normative power for eating healthy snacks (\( \beta=-0.095 \), se(b)=0.031, \( P=0.008 \)). Worksites with higher percentages of salaried workers were more likely to have higher levels of normative power for smoking (\( \beta=0.36 \), se(b)=0.08, \( P=0.0008 \)). The percent of salaried workers did not modify the relationship between normative power for eating healthy snacks, use of PPE, or safe work practices.

**DISCUSSION**

This study adapts Jackson's RPM as a new method of measuring health-related norms at work, characterizes the structural properties of these norms, and addresses several important limitations in the current literature on measuring health-related norms at work. The approach in this study moves beyond overly simplistic, single-item measures of norms.
that are unable to capture both the evaluative and behavioral dimensions of group norms about health. Second, this norm measure allows us to quantify and describe different structural characteristics of health-related norms at work. Third, this new measure creates opportunities to understand how health-related norms at work may be different for different health behaviors. Fourth, standardizing this measurement approach at the worksite level makes comparisons about the strength, intensity, and power of health-related norms across worksites possible. Finally, this first adaptation of the Jackson RPM for measuring health-related norms at work carefully and systematically measures, characterizes, and clarifies how intervention strategies to influence norms about health behaviors at work may be developed over time. Although we acknowledge that health-related normative power might be modified by demographic, organizational, or community factors that reside either internal or external to the work group being assessed, here a simple model was tested to determine whether health behavior-related normative power was related to health behaviors at work and whether selected employee characteristics modified the relationship between normative power and health.

Results revealed that different structural characteristics exist for different health behavior-related norms at work. For example, norms about eating healthy snacks at work were less crystallized and less intense (and, therefore, held less normative power) than did norms about the other 3 health-related norms studied. As the percentage of males in the workforce increased, normative power about healthy eating was further diminished. However, eating represents a complex set of behaviors. In this study, for feasibility purposes, the norms measure was restricted to “eating healthy snacks,” although “snacking” is only one of a plethora of eating behaviors. Had “eating breakfast” or “eating at least 5 fruits and vegetables a day” been chosen, differences in either intensity or crystallization (and thus normative power to influence group behavior on healthy eating) may have been observed.

The norm characteristics about healthy eating were interesting for other reasons as well. Despite limited statistical power to examine this relationship, only 3 of 15 worksites had policies about providing access to healthy foods at work (in contrast, for example, to the 14 of 15 worksites that had restrictive smoking policies). Biener et al. found that worksites with greater access to healthy foods at work, policies about offering healthy snacks, and programs to inform employees about availability of healthy snacks were associated with healthier eating habits among workers employed in those sites. If worksites in the current study had stronger policies about having access to healthy foods/snacks at work, the normative power for encouraging coworkers to eat healthy snacks would have been greater. Using these measures, future research can assess the relative contributions of organizational policies, normative power, and other potential determinants of behavior change. Multidimensional measures that differentiate norms along a full range of behavioral and evaluative continuum is an important first step toward understanding the mechanisms by which changes in employee health behavior are occurring and can be influenced.

Norms about encouraging smokers to make a smoking quit attempt, in contrast to those about eating healthy snacks, were intense, crystallized, and thus held relatively high levels of normative power for influencing group behavior around smoking. The fact that smoking-related normative power was inversely associated with the percentage of hourly workers (eg, higher smoking-related normative power was found in worksites with a lower percentage of hourly workers) is consistent with findings from several other studies. For example, Sorensen et al. found that hourly blue-collar workers reported less pressure to quit smoking, less social support for quitting from coworkers, and less nonacceptability of smoking among coworkers, compared to other white-collar (salaried) workers. Blue-collar workers have significantly higher smoking rates than those of white-collar workers, and this gap may be widening. Identifying variations in the characteristics of norms among workers by age, occupational status, and education is important for understanding the underlying determinants of high smoking rates among certain subgroups and for developing targeted interventions that address the unique normative behavior of these
groups. For example, the type of messages delivered to blue-collar work units might emphasize positive, yet humorous ways to encourage coworkers to quit smoking (or stay quit). Involving blue-collar workers in the development and delivery of these messages may enhance their credibility and impact.

Worksites with higher levels of smoking-related normative power were associated with a lower prevalence of smokers. Although the small worksite sample size limits statistical power to estimate these effects, all but one of the worksites in this study sample reported having a smokefree policy at work. Restricting tobacco exposure through smoking policy change has led to fewer cigarettes being smoked at work, improved cessation rates, and reduced worker exposure to ETS. Sorensen et al. has reported that employer efforts to promote compliance with smoking policies can also contribute to the development of a worksite climate supportive of nonsmoking. This new norms measure will contribute to active research on the possible interplay between smoking policy restrictions, enforcement of restrictive policies, and norms governing smoking-related behaviors at work.

Regarding occupational health behaviors, norms about the use of PPE were much less intense and less crystallized than were norms about adherence to safe work practices. Importantly, the average response for use of PPE in this sample was "rarely," which suggests that any observed patterns for the small number of respondents actually using PPE are likely to have been overwhelmed by the majority of respondents who had no reason to use PPE. Also, the use of PPE is a more individualized activity that pertains to a select few workers vs adherence to safe work practices that might be viewed as collective good for the "group" at any given worksite. As a result, differences in characteristics of norms about individualized vs. collective action might be expected. Similarly, the consequences associated with not using PPE or not choosing healthy snacks are not likely to jeopardize the health of coworkers, whereas the consequences of continuing to smoke (exposing coworkers to secondhand smoke) or the consequences of not following safe work practices (potentially resulting in serious injury or disease to oneself and coworkers) may be a catalyst for differential normative beliefs.

Results confirmed that the use of safe work practices was an intensely held, highly crystallized group norm within participating worksites. Normative power associated with safe work practices persisted even after controlling for the percent of males and salaried workers. Sorensen et al. found that hourly workers in worksites with integrated health promotion and health protection programs had twice the smoking quit rates compared with hourly workers in worksites with health promotion programs only. This study represents the first direct comparison of the influential power of norms for general health behaviors (healthy eating and smoking) versus occupational health behaviors (use of safe work practices and PPE). Understanding the important interplay involved with integrating health promotion and occupational health and safety intervention efforts will be advanced when we can clarify the role that norms may play in these relationships.

This new conceptualization of norms and the ability to characterize the structural components of different health norms within and across worksites are key strengths of this study. Like all studies, there are several limitations. First, the cross-sectional design limits causal inference. Second, although the 16 participating worksites were similar to the 41 sites invited to join the study (eg, all met the same eligibility requirements), it is possible that participating worksites were different on other important, unmeasured factors that may have influenced our results. Third, the norm-related questions were asked as part of the WellWorks-2 supplemental survey that experienced a 61% response rate. If healthier workers were more likely to respond to these questionnaires, then we might expect to see norms that are both more intense and more crystallized, than if we were able to secure a fully representative sample. Fourth, during pretesting, the Jackson norm measures were adapted to improve understandability, ease of implementation, and readability for the blue-collar workers in our study. As a result, the behavioral dimension response option was reduced from 5 to 3 for safe working practices (or 4 for smoking, healthy snacks, and PPE use), and the evaluative dimension was reduced from a
10-point scale to a 5-point scale. This trade-off between restricting the range of possible responses and improving the understanding of the survey questions for workers seemed essential. Despite this adaptation, significant variation in norm characteristics across health behavior-related norms, as well as relationships between normative power and 2 health behaviors were observed. Finally, although all non-norm-related measures have been used in previous worksite-based studies, and extensive pretesting accompanied development of the norms measure, additional psychometric work on the measures would strengthen these results.

Adaptations on the Jackson RPM advance efforts to evaluate important characteristics of health-related norms at work and give insight into possible intervention leverage points. Ongoing reinforcement of positive health messages within the physical and social work environment, training natural helpers to work with peers at work, providing incentives for change, rewarding and recognizing successful behavior change, and cultivating program champions all warrant further investigation as potential interventions for shifting normative power in favor of positive health behaviors. With improved measures of health-related norms, leverage points for planning, delivering, and evaluating interventions targeting both health promotion and health protection outcomes within an ecological context are possible.

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