A Consensus Method for Updating Psychosocial Measures Used in NIOSH Health Hazard Evaluations

Douglas M. Wiegand, PhD, Peter Y. Chen, PhD, Joseph J. Hurrell Jr, PhD, Steve Jex, PhD, Akinori Nakata, PhD, Jeannie A. Nigam, MS, Michelle Robertson, PhD, CPE, and Lois E. Tetrick, PhD

Objective: An expert panel was convened to select practical, valid psychosocial measures for use during National Institute for Occupational Safety and Health field investigations. **Methods:** A taxonomy of psychosocial constructs was developed using existing taxonomies and criteria regarding the malleability, actionability, and validity of constructs. Panel members identified measures for each construct based on their expertise and experience. Measures were selected on the basis of the following criteria: practicality, brevity, validity, availability of existing data, and lack of confounds between psychosocial constructs and outcomes. **Results:** The panel came to a consensus in recommending 24 measures representing 22 constructs. **Conclusions:** It is important that the National Institute for Occupational Safety and Health regularly evaluates its methodologies to ensure it is in line with current best practices. The measures identified will be used modularly in the National Institute for Occupational Safety and Health fieldwork depending on the nature of the evaluation request, industry type, and worker population.

In occupational safety and health, workplace investigations are necessary to identify hazard exposures and work conditions linked to employee illness and injury and to develop strategies for workplace intervention.[1] Occupational hazards include exposure to chemicals, biological agents, and allergens, as well as numerous physical factors, complex safety risks, and many varied psychosocial risks.[2]

Psychosocial risk factors are those aspects of the design and management of work (eg, scheduling, job demands, task complexity) as well as its social and organizational contexts (eg, interpersonal relationships, role requirements, organizational climate) that have the potential to cause physical or psychological harm to employees.[3] For example, many psychosocial factors are associated with *job stress*, or the harmful physical and emotional responses that occur when the requirements of a job are a poor match to the capabilities, resources, or needs of the worker.[4] To understand the possible causes and consequences of job stress, the concept can be further dissected into three types of variables: job stressors, strains, and health outcomes.[5]

Job stressors are the multiple psychosocial factors at work thought to impact the health and well-being of employees. Job-related *strains* are employees' negative physiological and emotional reactions to stressors, such as headaches, muscle/joint complaints, fatigue, and negative mood states.[6–8] *Health outcomes* refer to the more long-term, cumulative impact of exposure to stressors, such as cardiovascular disease,[9–10] musculoskeletal disorders,[11] and psychological disorders.[8,10]

Given the potential negative impact of psychosocial factors acting as stressors in the workplace, it is important to include evaluation of these factors during workplace investigations to identify problem areas and make recommendations for improving job design, working conditions, and interpersonal working relationships. Psychosocial risk factors are often measured by examining archival data, observation of work, or through information gathered from employees in interviews, focus groups, or self-reported surveys. Self-reported surveys are the most widely used measures because they are relatively less invasive, inexpensive, and easy to analyze.[12] Although these surveys are limited because of their cross-sectional and subjective nature, they are nonetheless considered very important in occupational safety and health because they can provide the first step in identifying risk factors linked to job stress and other negative outcomes.[13]

Research in this area has grown rapidly over the past several decades, leading to the development of several models of job stress and a range of perspectives on which psychosocial risk factors are most important to address when seeking to improve working conditions and reduce or eliminate associated negative outcomes.[14–17] As such, there are many published and unpublished measures of psychosocial risk factors and job stress,[5,12,18] which makes it difficult to determine which may be most useful when conducting a workplace investigation.

The remainder of this article describes the efforts of the National Institute for Occupational Safety and Health (NIOSH) to identify appropriate and practical measures of psychosocial risk factors for field use during health hazard evaluations (HHEs). Although this work was completed specifically for use within the NIOSH HHE program, the findings can be adapted for use at most workplaces.

THE NIOSH HHE PROGRAM

NIOSH is a part of the Centers for Disease Control and Prevention, an agency in the Department of Health and Human Services. NIOSH is a world leader in preventing work-related illness, injury, disability, and death by conducting scientific research, recommending appropriate health and safety rules and regulations, and by investigating workplace hazards as a part of its HHE program.[19] The mission of the NIOSH HHE program is to respond to requests (from employees, management, or union representatives of a workplace) to investigate potential occupational health hazards and to make specific and actionable recommendations to management for improving work conditions.

NIOSH project officers seek to measure and address psychosocial job stressors when an HHE request or subsequent information gathering indicates such issues may be adversely affecting employees, as assessed by measures of physical and mental health symptoms, job satisfaction, burnout, etc. By understanding the stressors present at a particular job, project officers can make specific recommendations to improve conditions and reduce related negative outcomes. However, a challenge for NIOSH is to select a tool or collection of tools that can be used during HHEs across occupational settings, with a variety of working populations to identify

From the Division of Surveillance, Hazard Evaluations, and Field Studies (Dr Wiegand), School of Management (Dr Chen), University of South Australia (Dr Hurrell), City West Campus, Adelaide, Australia; Department of Psychology (Dr Jex), Saint Mary's University, Halifax, Canada; Department of Psychology, Bowling Green State University, Bowling Green, Ohio; National Institute for Occupational Safety and Health, Cincinnati, Ohio; Division of Applied Research and Technology (Dr Nakata and Ms Nigam), National Institute for Occupational Safety and Health, Cincinnati, Ohio; Liberty Mutual Research Institute for Safety (Dr Robertson), Boston, Mass; and Department of Psychology (Dr Tetrick), George Mason University, Fairfax, Va.

Disclosure: The authors have no conflicts of interest to declare.

Address correspondence to: Douglas M. Wiegand, PhD, NIOSH/DSHEFS/HETAB, 4676 Columbia Parkway (MS R-10), Cincinnati, OH 45226 (dwiegand@cdc.gov).

DOI: 10.1097/JOM.0b013e3182440a04

psychosocial factors that may be contributing to job stress. Other challenges include selecting measures that are brief (project officers often have limited time when interacting with employees) and can provide information from which practical recommendations can be made.

NIOSH'S PAST EFFORTS TO SELECT PSYCHOSOCIAL AND JOB STRESS MEASURES FOR FIELD USE

In the late 1980s, NIOSH researchers assembled the NIOSH Generic Job Stress Questionnaire (GJSQ), a collection of standardized tools to measure psychosocial factors at work.[15] This process involved a content analysis of standardized stress-related measures by several experts in the field, both internal and external to NIOSH. The criteria used for selecting the measures for inclusion in the GJSQ included

1. evidence of acceptable reliability and validity;
2. lack of confound between the description of stressors and their consequences;
3. extensive use in prior research that provides norms for comparison; and
4. if no sound measure of a particular construct exists, then a scale was constructed.

The results of this content analysis included the selection of 26 measures totaling 179 items for NIOSH project officers to use in the field. Hurrell [Joseph Hurrell, Jr, PhD, March 3, 2011, unpublished data] later developed a shorter version of the original GJSQ based on a large-scale study of state employees, whereby item-total correlation analyses identified items that could be discarded on the basis of their inconsistency with other construct items.

Since the development of the GJSQ more than 20 years ago, no formal review of currently available psychosocial measures has taken place to ensure NIOSH project officers are using the most appropriate tools for identifying stressors during HHEs. Efforts have been made to inventory such measures[20]; however, this inventory is not comprehensive and has not been evaluated specifically for field use during HHEs. For example, which tools are brief enough to be used in the field, yet provide enough information so that specific recommendations can be made if an issue is detected? It is important that NIOSH researchers regularly evaluate their methodologies to ensure they are aligned with current best practices.

2010 EVALUATION OF PSYCHOSOCIAL MEASURES

In October 2010, NIOSH assembled a panel of eight experts in occupational health psychology to perform a content analysis of the existing job stress literature and to recommend constructs and measures that are appropriate and practical for measuring stress-related factors in a variety of work contexts. Panel members were selected by NIOSH representatives, who nominated individuals based on their publication record, field experience, and level of expertise in job stress measurement (all panel members are authors of this article). Selected panel members were given background materials on the HHE program and project goals well in advance of the panel sessions.

Panel members met for 2 days of roundtable discussion led by a professional facilitator. The initial discussion focused on reviewing the purpose and goals of the HHE program, as well as specific goals for the panel sessions. The next task involved identification of psychosocial constructs to focus on.

Through lengthy and detailed discussion, panel members developed a taxonomy of psychosocial constructs using several existing taxonomies[15,21–22] to ensure major constructs were not overlooked. Constructs not included in these guiding taxonomies were also included if they represented new or emerging psychosocial issues. This taxonomy served as the framework for the panel members' recommendations regarding useful measures.

The constructs were separated into those best measured at the organizational level (through informant interviews with management and observations of the work environment) and at the individual level (via employee surveys). The panel members focused on the individual-level constructs to determine whether they met the following criteria:

1. *Malleability:* The construct had to be something that could be changed, controlled, or influenced.
2. *Actionability:* The construct must be something that management, employees, or consultants could reasonably intervene upon.
3. *Empirical validity:* Literature about the construct must indicate that it is predictive of job stress.

If a construct failed to meet all three of these criteria, as determined by majority vote among the panel members, then it was removed from the taxonomy. For example, dissatisfaction with salary was excluded because it may not be actionable, or could be confounded by issues outside of work (eg, debt, number of children). In some instances, multiple constructs were listed under an umbrella construct label instead of listing them individually. For example, constructs such as role ambiguity, role conflict, and role overload were grouped into a single construct of role demands, although the recommended measures address all of these "sub-constructs." Some constructs were eliminated if they were judged to be redundant or otherwise better represented by other constructs. For example, boredom at work was considered to be represented in the job demands construct.

Using the revised taxonomy of constructs that met the above criteria, panel members recommended one or more measures for each construct. (In some cases, subscales or items from larger surveys were recommended.) Measures were recommended on the basis of panel members' experience with or knowledge of research conducted with them, and criteria included

1. practicality for informing recommendations,
2. brevity,
3. predictive validity,
4. potential availability of existing data,
5. readability, and
6. no confounds between stressors and strains.

During this process, the panel focused on one construct at a time and each panel member had the opportunity to recommend measure(s). At times, other panel members challenged an individual's recommendations based on the criteria listed earlier. When this would occur, which was rare, a discussion would ensue until consensus was reached whether or not to keep the recommended measure. Overall, consensus was reached quickly without controversy. The main reasons for excluding some of the suggested measures were lack of brevity, limited evidence of use in the scientific literature (ie, lack of available data, questionable reliability/validity), or both. Also, several measures were excluded because of limited response scales (eg, yes/no or true/false). Although these response scales could be adapted, it would interfere with the ability to make comparisons with other existing data sets.

The process of recommending and discussing measures of constructs took the majority of the second day of the panel session, with approximately 15 minutes spent on each construct.

At the end of the panel session, 24 measures covering 22 constructs were selected. Table 1 includes the taxonomy of constructs and measures identified by the expert panel, as well as sample items from the measures. The constructs are organized at the job, organization, interpersonal, and personal levels. Citations for the measures are also included to direct readers to the full measures and their original source.

Table 2 includes examples of organization-level variables that can be collected via observation or interview(s) with management

TABLE 1. Taxonomy of Job Stressors, Suggested Measures, and Sample Items

Construct	Measure(s)	Sample Items
Job level		
Job demands	NIOSH Generic Job Stress Questionnaire[15] Quality of Work Life Questionnaire[22] Job Characteristics Inventory[23] Job Diagnostic Survey[24] Multimethod Job Design Questionnaire[25]	My job requires a great deal of concentration. My job requires that I work very fast. How repetitious are your duties? The job requires a person to use a number of complex or sophisticated skills. The tasks are simple and uncomplicated.
Job control	NIOSH Generic Job Stress Questionnaire[15] Quality of Work Life Questionnaire[22]	How much influence do you have over the order in which you perform tasks at work? I have a lot of say about what happens on my job.
Meaningful work	Copenhagen Psychosocial Questionnaire[26] Multimethod Job Design Questionnaire[25]	Do you feel that the work you do is important? The job is significant and important compared with other jobs in the organization.
Perceptions of risk	NIOSH Generic Job Stress Questionnaire[15] Quality of Work Life Questionnaire[22]	The safety conditions where I work are good. The overall quality of the physical environment where I work is poor.
Predictability of work	Predictability of Work Scale[27]	To what extent do unexpected events occur on your job?
Responsibility for others	Measure of Personnel Resource Allocations and Coordination Activities [28] NIOSH Generic Job Stress Questionnaire[15]	How much say do you have in decisions about how work gets divided up among people? How much responsibility do you have for the morale of others?
Role demands	Job Ambiguity Scale[29] NIOSH Generic Job Stress Questionnaire[15]	I am certain how to go about getting my job done (the methods to use). I receive incompatible requests from two or more people.
Utilization of skills	Copenhagen Psychosocial Questionnaire[26] NIOSH Generic Job Stress Questionnaire[15]	At work, how pleased are you with the way your abilities are used? How often can you use the skills from your previous experience and training?
Organization level		
Job insecurity	Copenhagen Psychosocial Questionnaire[26] Effort Reward Imbalance[30] NIOSH Generic Job Stress Questionnaire[15]	Are you worried about new technology making you redundant? My job security is poor. How certain are you about what your responsibilities will be 6 months from now?
Organizational constraints	Organizational Constraints Scale[31]	How often do you find it difficult or impossible to do your job because of lack of equipment or supplies?
Organizational justice	Multidimensional Organizational Justice Measure[32]	The following items refer to (the authority figure who enacted the procedure). To what extent has s/he treated you in a polite manner?
Perceived organizational support	Survey of Perceived Organizational Support Scale[33]	The organization cares about my general satisfaction at work.
Trust in management	Copenhagen Psychosocial Questionnaire[26] Trust in/Loyalty to Leader Scale[34]	Can you trust the information that comes from the management? My manager would never try to gain an advantage by deceiving workers.
Safety climate	Organizational-level and Group-level Safety Climate[35]	Top management in this company listens carefully to workers' ideas about improving safety. My direct supervisor refuses to ignore safety rules when work falls behind schedule.
Violation of psychological contract	Perceived Psychological Contract Violation Scale[36,37]	I feel betrayed by my company. Has your employer ever failed to meet the obligation(s) that were promised to you?
Interpersonal level		
Cohesiveness	Copenhagen Psychosocial Questionnaire[26] Perceived Cohesion Scale[38]	Is there good cooperation between the colleagues at work? I feel a sense of belonging to the company.
Harassment and discrimination	Generalized Workplace Harassment Questionnaire[39,40] Negative Acts Questionnaire-Revised[41]	How often have you been in a situation where someone in your work setting turned others in your work environment against you?

(*Continued*)

TABLE 1. (*Continued*)

Construct	Measure(s)	Sample Items
		In the past 12 months at work, have you been discriminated against or harassed because of your race, ethnicity, color, or national origin?
Inclusion/exclusion	Workforce Diversity Questionnaire[42]	It's hard to get ahead here unless you are part of the old boys' network.
Interpersonal conflict	Interpersonal Conflict at Work Scale[31]	How often do you get into arguments with others at work?
	NIOSH Generic Job Stress Questionnaire[15]	There is cooperation between my group and other groups.
Social undermining	Social Undermining Scales[43]	In the past month, how often has your *supervisor* intentionally belittled you or your ideas?
		In the past month, how often has *the coworker closest to you* intentionally spread rumors about you?
Workplace incivility	Workplace Incivility Scale[44]	During the past [TIME] while employed by [COMPANY] have you been in a situation where any of your supervisors or coworkers addressed you in unprofessional terms, either publicly or privately?
Personal level		
Work–family conflict	Work-Family Conflict Items[45] Work-Family Conflict Scale and Family-Work Conflict Scale[46]	My home life interferes with my responsibilities at work such as getting to work on time, accomplishing daily tasks, and working overtime. In the last [TIME REFERENT] how often did your job or career interfere with your family life in any way (eg, time spent with family, being distracted or short-tempered because of work)?

TABLE 2. Examples of Organizational Variables to Be Observed or Explored During Interviews With Management or Human Resources

Organizational Variables
Work hours
Where does info/policy reside (in which department)?
Workload variance
Growth opportunities
Team work & solitary workers
VPP–Voluntary Protective Program
Sociotechnological issues
Organizational structure
Subsystems
Climate/culture
Communication structure
Provision of health services, EAP, etc
Travel, relocation
Work-life balance policies
Retirement policies
Workplace restructuring and job future ambiguity
Responsibility for others
Disciplinary procedures

EAP, Employee Assistance Program.

or human resource representatives for the company. These variables were identified through the initial discussion of which constructs to focus on, and the list was made with the only criterion being that the variables be something that could be quickly assessed by observation or in an interview session with a company representative. Given the purpose of the panel was to select survey measures of job stressors, these organizational-level variables were not discussed at length. Like the job stressor measures, the organizational-level variables to be explored during an HHE depend on the nature of the request and a list should be tailored to ensure only pertinent, useful information is collected and that there is no redundancy with the efforts of other project officers assigned to the HHE (eg, NIOSH physicians assigned to HHEs conduct medical interviews regarding exposures and health symptoms and review medical records and injury logs.).

DISCUSSION

The measures identified by the NIOSH Expert Panel will be used in HHE fieldwork in a modular fashion, selecting particular constructs based on the nature of the HHE request, industry type, and worker population. Typically, the appropriate constructs to explore during an HHE will be evident in the request documentation, which allows the requestor to provide details regarding exposures and health effects. Otherwise, such information can be gathered during phone discussions with the requestor, management, or both in preparation for the site visit. It is important to note that the constructs identified by this panel are not meant to represent the entire spectrum of job stressors; however, the panel feels it identified the most common job stressors. If an HHE request indicates a novel or specific construct not identified by the panel is in need of assessment, then NIOSH project officers will explore the literature to find potentially useful measures or consult with experts to address the specific stressors.

When completing an HHE, NIOSH medical officers meet briefly with affected employees to complete confidential medical interviews (reviewing symptoms, health history, and medical records). Surveys may also be implemented at this time to capture the employee's perspective regarding job stressors or strain experienced (ie, the physiological and psychological symptoms linked to the stressors). It is ideal that the medical officer(s) who administers the psychosocial surveys, discusses the organizational policies and procedures with management (ie, the factors included in Table 2) and summarizes the results and recommendations in the final HHE report have a background in psychology or a related field. Otherwise, NIOSH medical officers with different specializations can seek consultation and training from an expert in how to administer, score, and interpret the results of the psychosocial surveys.

By having the health and survey information linked for each worker, project officers can look for relationships between stressors and strains if there is enough statistical power based on sample size. Sample size presents a challenge when the workforce being evaluated is small because it is difficult to explore relationships between variables or to make statistically meaningful comparisons

among groups. In these instances, stressor measures can still be used to explore issues and present descriptive statistics from which recommendations can be made.

The measures selected by NIOSH's expert panel will be evaluated over time based on their psychometric properties and practical value in informing recommendations. In addition, a normative database will be developed using data from HHEs and solicitations to other researchers and practitioners for existing data sets using these measures. A normative database will be useful for making comparisons between similar jobs when HHE results are reported and will also be useful for conducting factor analyses to refine scales, develop a single generic instrument for field use, or both.

It is especially important to evaluate the psychometric properties of the recommended measures if they represent abbreviations or selected items from an existing scale. Most of the recommended measures were developed for research purposes and were not intended to be truncated for field use. However, given the challenge of having very limited time with workers in the field, it is necessary for project officers to use brief measures to gain a general understanding of what stressors are salient in the workplace being evaluated.

As the nature of work continues to change, it is likely that new forms of job stressors will emerge.[18,47] NIOSH will continue to adapt and evaluate its methodologies for assessing job stressors across a variety of occupations and working populations.

REFERENCES

1. Bernard B. Conducting workplace investigations. In: Levy BS, Wegman DH, Baron SL, Sokas RK, eds. *Occupational and Environmental Health: Recognizing and Preventing Disease and Injury*. New York, NY: Oxford University Press; 2006:683–696.
2. Concha-Barrientos M, Imel ND, Driscoll T, et al. Selected occupational risk factors. In: Ezzati M, Lopez AD, Rodgers A, Murray CJL, eds. *Comparative Quantification of Health Risks*. Geneva, Switzerland: World Health Organization; 2004.
3. Cox T, Griffiths A. The nature and measurement of work-related stress: theory and practice. In: Wilson JR, Corlett N, eds. *Evaluation of Human Work*. 3rd ed. London, England: CRC Press; 2005.
4. National Institute for Occupational Safety and Health. Stress . . . at work. Publication No. 99–101. Cincinnati, OH: US Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health; 1999.
5. Hurrell JJ Jr, Nelson DL, Simmons BL. Measuring job stressors and strains: where we have been, where we are, and where we need to go. *J Occup Health Psychol*. 1998;3:368–389.
6. Hurrell JJ Jr, Colligan MJ. Psychological job stress. In: Rom WN, ed. *Environmental and Occupational Medicine*. New York, NY: Little Brown & Co; 1982.
7. Karasek R, Theorell T. *Healthy Work: Stress, Productivity, and the Reconstruction of Working Life*. New York, NY: Basic Books; 1990.
8. National Institute for Occupational Safety and Health. Work organization and stress-related disorders. Available at: http://www.cdc.gov/niosh/programs/workorg/. Accessed January 1, 2010.
9. Karasek R, Baker D, Marxer F, Ahlbom A, Theorell T. Job decision latitude, job demands, and cardiovascular disease: a prospective study of Swedish men. *Am J Public Health*. 1981;71:694–705.
10. Sauter SL, Murphy LR, Hurrell JJ Jr. Prevention of work-related psychological disorders. *Am Psychol*. 1990;45:1146–1158.
11. National Institute for Occupational Safety and Health. Musculoskeletal disorders and workplace factors: a critical review of epidemiologic evidence for work-related musculoskeletal disorders of the neck, upper extremity, and low back. Publication No. 97-141. Cincinnati, OH: US Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health; 1997.
12. Tabanelli MC, Depolo M, Cook RMT, et al. Available instruments for measurement of psychosocial factors in the work environment. *Int Arch Occup Enivron Health*. 2008;82:1–12.
13. Theorell T, Hasselhorn HM. On cross-sectional questionnaire studies of relationships between psychosocial conditions at work and health—are they reliable? *Int Arch Occup Enivron Health*. 2005;78:517–522.
14. French JPR, Caplan RD, van Harrison R. *The Mechanisms of Job Stress and Strain*. New York, NY: John Wiley & Sons; 1982.
15. Hurrell JJ Jr, McLaney MA. Exposure to job stress: a new psychometric instrument. *Scand J Work Environ Health*. 1988;14:27–28.
16. Karasek R. Job demands, job decision latitude and mental strain: implications for job redesign. *Adm Sci Q*. 1979;24:285–308.
17. Siegrist J. Adverse health effects of high-effort/low-reward conditions. *J Occup Health Psychol*. 1996;1:27–41.
18. World Health Organization. Health impact of psychosocial hazards at work: an overview. Available at: http://whqlibdoc.who.int/publications/2010/9789241500272_eng.pdf. Accessed April 1, 2011.
19. National Institute for Occupational Safety and Health. Health hazard evaluation program. Publication No. 2009-167. Cincinnati, OH: US Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health; 2009.
20. National Institute for Occupational Safety and Health. Organization of work: measurement tools for research and practice. Available at: http://www.cdc.gov/niosh/topics/workorg/tools/search.html. Accessed: January 1, 2011.
21. Beehr TA, Newman JE. Job stress, employee health and organizational effectiveness: a facet analysis, model, and literature review. *Pers Psychol*. 1978;31:665–699.
22. National Institute for Occupational Safety and Health. Quality of worklife questionnaire. Available at: http://www.cdc.gov/niosh/topics/stress/qwlquest.html#research. Accessed January 1, 2011.
23. Sims HP, Szilagyi AD, Keller RT. The measurement of job characteristics. *Acad Manag J*. 1976;19:195–212.
24. Hackman JR, Oldham GR. Work redesign. Reading, MA: Addison–Wesley Publishing Company; 1980.
25. Campion MA. Interdisciplinary approaches to job design: a constructive replication with extensions. *J Appl Psychol*. 1988;73:467–481.
26. Pejtersen JH, Kristensen TS, Borg V, Bjorner JB. The second version of the Copenhagen Psychosocial Questionnaire. *Scand J Public Health*. 2010;38:8–24.
27. Tetrick LE, LaRocco JM. Understanding, prediction, and control as moderators of the relationships between perceived stress, satisfaction, and psychological well-being. *J Appl Psychol*. 1987;72:538–543.
28. Moch M, Cammann C, Cooke RA. Organizational structure: measuring the distribution of influence. In: Seashore SE, Lawler EE, Mirvis PH, Cammann C, eds. *Assessing Organizational Change: A guide To Methods, Measures, and Practices*. New York, NY: John Wiley & Sons; 1983:177–201.
29. Breaugh JA, Colihan JP. Measuring facets of job ambiguity: construct validity evidence. *J Appl Psychol*. 1994;79:191–202.
30. Siegrist J, Wege N, Pühlhofer F, Wahrendorf M. A short generic measure of work stress in the era of globalization: effort-reward imbalance. *Int Arch Occup Environ Health*. 2009;82:1005–1013.
31. Spector PE, Jex SM. Development of four self-report measures of job stressors and strain: Interpersonal Conflict at Work Scale, Organizational Constraints Scale, Quantitative Workload Inventory, and Physical Symptoms Inventory. *J Occup Health Psychol*. 1998;3:356–367.
32. Colquitt JA. On the dimensionality of organizational justice: a construct validation of a measure. *J Appl Psychol*. 2001;86:386–400.
33. Eisenberger R, Huntington R, Hutchison S, Sowa D. Perceived organizational support. *J Appl Psychol*. 1986;71:500–507.
34. Podsakoff PM, MacKenzie SB, Moorman RH, Fetter R. Transformational leader behaviors and their effects on followers' trust in leader, satisfaction, and organizational citizenship behaviors. *Leadersh Q*. 1990;1:107–142.
35. Zohar D, Luria G. A multilevel model of safety climate: cross-level relationships between organization and group-level climates. *J Appl Psychol*. 2005;90:616–628.
36. Robinson SL, Rousseau DM. Violating the psychological contract: not the exception but the norm. *J Organ Behav*. 1994;15:245–259.
37. Robinson SL, Morrison EW. The development of psychological contract breach and violation: a longitudinal study. *J Organ Behav*. 2000;21:525–546.
38. Bollen KA, Hoyle RH. Perceived cohesion: a conceptual and empirical examination. *Soc Forces*. 1990;69:479–504.
39. Rospenda KM, Richman JA. The factor structure of general workplace harassment. *Violence Vict*. 2004;19:221–238.
40. Rospenda KM, Richman JA, Shannon CA. Prevalence and mental health correlates of harassment and discrimination in the workplace: results from a national study. *J Interpers Violence*. 2009;24:819–843.
41. Einarsen S, Hoel H, Notelaers G. Measuring exposure to bullying and harassment at work: validity, factor structure and psychometric properties of the Negative Acts Questionnaire-Revised. *Work Stress*. 2009;23:24–44.

42. Larkey LK. The development and validation of the Workforce Diversity Questionnaire: an instrument to assess interactions in diverse workgroups. *Manag Commun Q*. 1996;9:296–337.
43. Duffy MK, Ganster DC, Pagon M. Social undermining in the workplace. *Acad Manag*. 2002;45:331–351.
44. Cortina LM, Magley VJ, Williams JH, Langhout RD. Incivility in the workplace: incidence and impact. *J Occup Health Psychol*. 2001;6:64–80.
45. Grzywacz JG, Frone MR, Brewer CS, Kovner CT. Quantifying work-family conflict among registered nurses. *Res Nurs Health*. 2006;29:414–426.
46. Netemeyer RG, Boles JS, McMurrian R. Development and validation of work-family conflict and family-work conflict scales. *J Appl Psychol*. 1996;81:400–410.
47. National Institute for Occupational Safety and Health. The changing organization of work and the safety and health of working people: knowledge gaps and research directions. Publication No. 2002-116. Cincinnati, OH: US Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health; 2002.

