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RESEARCH ARTICLE

Technostress: Technological Antecedents and Implications

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Appendix A

Survey Details

Details about Zoomerang

Zoomerang has over 2 million registered individuals (referred to as Zoompanel). Zoomerang profiles its panelists on over 500 attributes and provides incentives to the panelists for their participation in surveys. Zoomerang (2009) reports that their panelists represent the U.S. census. In fact, they claim that their random selection of panelists would provide a nationally representative sample as opposed to a random convenience sample.

Individuals that participate in Zoomerang's research have double opted into the panel to provide opinions. Double opt-in implies that panelists sign up and then are given a chance to back out of the panel (making sure that they really DO want to participate). For their opinions and time, the panelists are provided with incentive points for each survey that they complete. This is not dissimilar to the incentives often given to complete an instrument in traditional academic mail surveys where mailings are made to a directory (sample frame) of participants.

We report that data collected using Zoompanel provides greater control because "inclusion criterion" could be developed in terms of screening questions to ensure sample frame requirements are met. For example, if a study's sample requirements are IT managers working in nonprofit organizations in the northeast, it could be achieved by developing appropriate screening questions. Based on the information stored on each panelist, Zoomerang sends invitations to a nationally representative random sample, and the screening questions developed by researchers specific to their studies ensure that the final sample obtained is random and meets the sample frame requirements.

Since the present research studies the impact of ICTs on individuals, the sample frame is not constrained to any particular occupation. To truly understand the impact of ICTs on individuals in work settings, some key attributes of the population are desired (i.e., individuals should be working full-time, they should use ICTs). Therefore, the population selected for this study is the working adult population who are business users of ICTs.

So we developed two inclusion criteria:

- Do you work full time?
- Do you use any of these technologies?

Existing academic studies that used Zoompanel data used a similar approach to obtain their sample; that is, Zoomerang sends an e-mail to their panelists with a link to the questionnaire and the respondents are filtered based on sample frame requirements to obtain required sample (see Wallenstein et al. 2008; Yang et al. 2008).

We would also like to engender confidence in the use of online panel data for academic research. Braunsberger et al. (2007) report that data obtained from online panels is more reliable than that obtained from telephone surveys, engendering confidence in use of online panel data. In addition, Zoomerang is not the only online panel source which has been used in academic research (e.g., Piccolo and Colquitt 2006[1]). Further, and more importantly, we would like to engender confidence in the use of Zoompanel as a data source.

In academic research, data from Zoompanel is used in the fields of organizational behavior (Rogers and Bazerman 2008; Thau et al. 2009), marketing (Du et al. 2007; Wonder et al. 2008), psychology (Basil et al. 2009), medical sciences (Becker et al. 2007; Wallenstein et al. 2008; Yang et al. 2008), food service (Hicks et al. 2008), hospitality management (Lynn 2009; Shang et al. 2010). Although we used Zoompanel as a data source, we had complete control over all other aspects of research methodology (e.g., we provided the text to be included in the email invitation, developed the survey hosted at http://www.zoomerang.com, etc.).

Information on ICTs

The following information is provided at the beginning of the survey to clarify what is meant by ICTs.

- **Please note** that ICTs involve a collection of information, processing, storage, network, and communication technologies.

  ICTs are **NOT** shop-floor manufacturing technologies that are used to automate manufacturing processes. A list of **ICTs** is provided below.

An example of a representative stem we used is "Considering the use of information and communication technologies (ICTs) for your work-related tasks, indicate the degree to which you agree to the following." Note that we emphasized use of ICTs for work-related tasks (i.e., not for personal use).

The list of ICTs used in this study to screen the sample is provided below. Further, once the respondents were actually taking the survey, a hyperlink to the term *ICTs* is provided on each survey page.

List of ICTs

- Mobile technologies (e.g., Cell phone, Pager, BlackBerry®, Laptop, PDA (personal digital assistant))
- Network technologies (e.g., Internet, Intranet, VPN)
- Communication technologies (e.g., e-mail, voicemail)
- Enterprise and Database technologies (e.g., PeopleSoft®, SAP®, Oracle® applications)
- Generic application technologies (e.g., Word Processing, Spreadsheet, Presentation)
- Collaborative technologies (e.g., IM (instant messaging), VideoConferencing, Teleconferencing)
- Other work specific technologies

[1]For a list of other studies, go to "The Study Response Project" at http://studyresponse.syr.edu/studyresponse/techreports.htm.

Appendix B

Items and Loadings

Construct	Items	Factor Loadings	Reliability (alpha) α
Work Overload (Moore 2000)	ICTs create many more requests, problems, or complaints in my job than I would otherwise experience.	0.73	0.88
	I feel busy or rushed due to ICTs.	0.88	
	I feel pressured due to ICTs.	0.87	
Work Home Conflict (Kreiner 2006; Netemeyer et al. 1996)	Using ICTs blurs boundaries between my job and my home life.	0.83	0.93
	Using ICTs for work-related responsibilities creates conflicts with my home responsibilities.	0.90	
	I do not get everything done at home because I find myself completing job-related work due to ICTs.	0.92	
Invasion of Privacy (Alge 2001; Eddy et al. 1999)	I feel uncomfortable that my use of ICTs can be easily monitored.	0.85	0.94
	I feel my privacy can be compromised because my activities using ICTs can be traced.	0.92	
	I feel my employer could violate my privacy by tracking my activities using ICTs.	0.91	
	I feel that my use of ICTs makes it easier to invade my privacy.	0.84	
Role Ambiguity (Moore 2000)	I am unsure whether I have to deal with ICT problems or with my work activities.	0.86	0.93
	I am unsure what to prioritize: dealing with ICT problems or my work activities.	0.86	
	I can NOT allocate time properly for my work activities because my time spent on ICTs-activities varies.	0.90	
	Time spent resolving ICT problems takes time away from fulfilling my work responsibilities.	0.82	
Strain (Moore 2000)	I feel drained from activities that require me to use ICTs.	0.91	0.97
	I feel tired from my ICT activities.	0.97	
	Working all day with ICTs is a strain for me.	0.93	
	I feel burned out from my ICT activities.	0.92	
Usefulness (Moore and Benbasat 1991)	Use of ICTs enables me to accomplish tasks more quickly.[†]	0.87	0.94
	Use of ICTs improves the quality of my work.	0.89	
	Use of ICTs makes it easier to do my job.	0.93	
	Use of ICTs enhances my effectiveness on the job.	0.92	
Complexity[‡] (Moore and Benbasat 1991)	Learning to use ICTs is easy for me.	0.77	0.90
	ICTs are easy to use.	0.86	
	It is easy to get results that I desire from ICTs.	0.94	
Reliability (DeLone and McLean 1992, 2003; Jiang et al. 2002)	The features provided by ICTs are dependable.	0.85	0.86
	The capabilities provided by ICTs are reliable.	0.90	
	ICTs behave in a highly consistent way.	0.86	
Presenteeism	The use of ICTs enables others to have access to me.	0.90	0.97
	ICTs make me accessible to others.	0.94	
	The use of ICTs enables me to be in touch with others.	0.97	
	ICTs enable me to access others.	0.95	

Construct	Items	Factor Loadings	Reliability (alpha) α
Anonymity (Pinsonneault and Hippel 1997)	It is easy for me to hide how I use ICTs. I can remain anonymous when using ICTs. It is easy for me to hide my ICT usage. It is difficult for others to identify my use of ICTs.	0.92 0.90 0.97 0.88	0.95
Pace of Change (Heide and Weiss 1995; Weiss and Heide 1993)	I feel that there are frequent changes in the features of ICTs. I feel that characteristics of ICTs change frequently. I feel that the capabilities of ICTs change often. I feel that the way ICTs work changes often.	0.88 0.93 0.87 0.80	0.94
Job Insecurity (Ashford 1989)	ICTs will advance to an extent where my present job can be performed by a less skilled individual. I am worried that new ICTs may pose a threat to my job. I believe that ICTs make it easier for other people to perform my work activities.	0.89 0.80 0.71	0.84
Negative Affectivity (Agho et al. 1992)	I often find myself worrying about something. My feelings are hurt rather easily. I suffer from nervousness. My mood often goes up and down. I often lose sleep over my worries.	0.72 0.72 0.82 0.78 0.71	0.86

†Petter et al. (2007) argue that typical usefulness constructs have both reflective and formative items. For example, this item could be argued as being formative with respect to the next item. This is still a gray area as most of the items are interchangeable.
‡Note that the measures are reverse coded (i.e., higher scores on these items implies lower complexity).

Technology usage was captured by a single item measuring the time spent using ICTs.

Appendix C

Reliability and Validity Analysis

The means and standard deviations for each of the constructs are shown in Table C1. Next, all of the items were loaded onto their respective latent constructs. The factor loadings and reliabilities of the constructs used in this study are also shown in Table C1.

Further, the correlations among the constructs and the average variance explained for each construct is shown in Table C2. Convergent validity and reliability of constructs used in this study are reflected through the measures of Cronbach's alpha, factor loadings, and average variance extracted (AVE). Results from confirmatory factor analysis, tabulated in Table C1, indicate that the reliabilities for all the constructs exceed the recommended cutoff of 0.70. The reliabilities of constructs in the present study are similar to those reported by Ahuja et al. (2007), whose work used constructs that are similar in nature to the present work. Further, all of the factor loadings are above the recommended value of 0.70 and the AVE for each construct is above 0.50, indicating that the latent factors can explain at least 50 percent of the measured variance among items (Fornell and Larker 1981). Discriminant validity among constructs is exhibited if the square root of average variance extracted (AVE) for each construct is greater than all interconstruct correlations (Chin 1998). As shown in correlations Table C2, the results indicate that all interconstruct correlations are less than the square root of AVE, indicating discriminant validity among constructs. Two additional analyses, including pair-wise comparisons of relevant constructs, also indicated that constructs exhibited discriminant validity.

Table C1. Factor Loadings and Reliabilities						
Construct	**Anchor Points**	**Mean**	**Standard Deviation**	**No. of Items**	**Confirmatory Factor Loadings Range**	**Reliability (alpha) α**
Work Overload	1–Strongly Disagree 7–Strongly Agree	3.54	1.57	3	0.73-0.88	0.88
Work Home Conflict	1–Strongly Disagree 7–Strongly Agree	3.10	1.67	3	0.83-0.92	0.93
Invasion of Privacy	1–Strongly Disagree 7–Strongly Agree	4.14	1.74	4	0.84-0.92	0.94
Role Ambiguity	1–Strongly Disagree 7–Strongly Agree	3.19	1.47	4	0.82-0.90	0.93
Strain	1–Never 7–Daily	2.89	1.61	4	0.91-0.97	0.97
Usefulness	1–Strongly Disagree 7–Strongly Agree	5.35	1.21	4	0.87-0.93	0.94
Complexity	1–Strongly Disagree 7–Strongly Agree	5.10	1.25	3	0.77-0.94	0.90
Reliability	1–Strongly Disagree 7–Strongly Agree	4.58	1.26	3	0.85-0.90	0.86
Presenteeism	1–Strongly Disagree 7–Strongly Agree	5.69	1.07	4	0.90-0.97	0.97
Anonymity	1–Strongly Disagree 7–Strongly Agree	2.48	1.34	4	0.88-0.97	0.95
Pace of Change	1–Strongly Disagree 7–Strongly Agree	4.81	1.18	4	0.80-0.93	0.94
Job Insecurity	1–Strongly Disagree 7–Strongly Agree	3.12	1.52	3	0.71-0.89	0.84
Negative Affectivity	1–Strongly Disagree 7–Strongly Agree	3.34	1.63	5	0.71-0.82	0.86

Table C2. Correlations Among Constructs													
Construct	**wo**	**whc**	**inp**	**ra**	**s**	**pu**	**cm**	**rel**	**prs**	**ano**	**pc**	**ji**	**na**
Work Overload–wo	**0.70**												
Work–Home Conflict–whc	0.54	**0.79**											
Invasion of Privacy–inp	0.30	0.24	**0.77**										
Role Ambiguity–ra	0.68	0.58	0.45	**0.74**									
Strain–s	0.58	0.51	0.31	0.59	**0.87**								
Usefulness–pu	-0.22	-0.08	-0.02	-0.08	-0.08	**0.82**							
Complexity–cm	-0.16	-0.16	-0.23	-0.16	-0.10	0.36	**0.74**						
Reliability–rel	-0.21	-0.11	-0.25	-0.19	-0.11	0.20	0.40	**0.76**					
Presenteeism–prs	0.19	0.12	0.13	0.14	0.21	-0.12	-0.07	0.01	**0.89**				
Anonymity–ano	-0.14	0.02	-0.32	-0.08	-0.11	0.12	0.18	0.31	-0.24	**0.85**			
Pace of Change–pc	0.20	0.14	0.16	0.25	0.25	-0.11	-0.08	-0.17	0.15	-0.18	**0.76**		
Job Insecurity–ji	0.13	0.20	0.20	0.19	0.21	0.18	0.08	0.24	0.04	0.08	0.17	**0.65**	
Negative Affectivity–na	0.21	0.18	0.25	0.23	0.30	0.03	-0.10	-0.09	-0.01	-0.10	0.14	0.17	**0.56**

Diagonal elements represent average variance extracted (AVE). For n = 661, correlations above 0.09 and 0.11 are significant at 5 percent and 1 percent respectively.

Appendix D

Common Methods Bias Analysis

Perceptual or subjective measures are used to effectively capture differences in individual responses to the same situations, rather than use objective measures (Cooper et al. 2001; Jex and Bheer 1991; Perrewe and Zellars 1999). However, common method bias could be a potential problem with subjective measures. In a critical review of common method bias in behavioral research, Podsakoff et al. (2003) provide recommendations to alleviate it. Specifically, they suggest that researchers

(1) use procedural remedies during questionnaire design, and
(2) use statistical controls

In this study, we have incorporated the above suggestions in the following way. For procedural remedies, we have

- Psychologically separated the measurements of criterion and predictor variables. This was achieved by providing a cover story between the criterion and predictor measurement phases (Table D1).
- Assured respondents' anonymity and that there is no right or wrong answer.
- Paid close attention to the items to avoid the use of ambiguous or unfamiliar terms, vague concepts, and "double-barreled" questions.
- Used different scale endpoints and formats for predictor and criterion variables, wherever possible.

Statistically, method variance is assessed by using Harman's single factor test and by modeling a single latent method factor. Harman's single factor test suggests that if a single factor explains significant covariance among variables, then it implies the presence of common method bias. The commonly accepted standard for *significant covariance* explained to be considered a potential problem is at least 25 percent. The results of this test did not yield a single dominant factor. The largest variance explained by a single factor in unrotated factor solution and in rotated factor solution is 21 percent and 9 percent, respectively. These results suggest that method bias might not pose a severe threat. However, it should be noted that Harman's test is only a diagnostic test and it does not actually control for method bias. Therefore, based on recommendations by Podsakoff et al. (2003) and recent IS articles (Ahuja et al. 2007; Liang et al. 2007), the unmeasured methods latent factor was explicitly modeled in this study.

In this approach, items are allowed to load on their proposed constructs and also on a latent common methods variance factor. The structural model is then tested for significance of parameters both with (Model B) and without (Model A) the latent methods factor. Model B makes intuitive sense because the same method was used to measure all of the variables. Modeling a latent method factor significantly improves the fit of the model if common method bias accounts for most of the covariance observed in the variables. The results of this analysis are summarized in Table D2.

Table D1. Procedural Remedies for Method Bias

Separation Introduced Through the Following Statements	Comments
Did you know? The Zip Code 12345 is assigned to Schenectady, New York.	Introduced between measures of stressors and strain
If you were wondering, zip code 54321 does not exist.	Introduced between measures of strain and technology characteristics
Did you know? Identical twins do not have identical fingerprints.	Introduced between measures of technology characteristics because the measures had similar anchor points
You are more than half-way through the survey...*Thank You* for your patience as we research this important issue. You have almost finished 90% of the survey...Thank You for helping in this non-profit research. Last two pages...Thank YOU!! for helping us better understand the implications of technologies.	These statements are distributed in the survey to motivate the respondents and also to provide separation

Table D2. Method Bias Test				
Model	**Chi-Square**	**CFI**	**RMSEA**	**Comment**
Model A: All items load on respective factors.	1250 with 784 df	0.981	0.030	Significant method bias exists if Model B fits significantly better than Model A. Results indicate that ΔCFI is less than 0.01 indicating lack of method bias.
Model B: All items load on respective factors and also on a method factor.	1089 with 744 df	0.986	0.027	

While comparing the fit indices between Models A and B, it should be noted that chi-square differences are sensitive to sample size. Therefore, in addition to the chi-square difference test, researchers have suggested to test for differences in comparative fit indices (CFI) (Byrne 2006; Cheung and Rensvold 2002; Little 1997) where the difference in CFI should be less than 0.05 (Little 1997) or according to Cheung and Rensvold (2002) less than 0.01. Although the difference in chi-square itself is significant, it should be noted that the ratio of chi-square difference per single degree of freedom is less than 3. Further, these results are similar to those reported by Ahuja et al. (2007) and within the recommendations of Hu and Bentler (1999). Additional evidence was obtained by comparing the differences in CFI. The results indicate that CFI of 0.005 is less than the recommended values of 0.05 (Little 1997) or 0.01 (Cheung and Rensvold 2002). These results further provide support that common method bias was not a serious validity threat to this study.

Appendix E

Control Variable Analyses

In the proposed research model, it was argued that stressors due to ICTs (i.e., work overload, role ambiguity, work–home conflict, invasion of privacy, and job insecurity) should be controlled for technology usage, and strain due to ICTs should be controlled for the dispositional variable negative affectivity. The results support this argument. The results for control variables are shown below.

Control Variable Relationship	Standardized Coefficient (β)
For Technology Use and	
Work Overload	.21*
Role Ambiguity	.19*
Work–Home Conflict	.21*
Invasion of Privacy	.09**
Job Insecurity	.11*
For Negative Affectivity and	
Strain	.14*

*Significant at 1%   **Significant at 5%

The links between technology usage and stressors are all significant (β's ranging from 0.09 to 0.21, all significant at 5 percent at least). The results indicate that as individuals become more dependent on technologies (i.e., increasing technology usage), they experience higher levels of stressors. It could also be interpreted that, as technology use increases, there are greater instances in which ICTs could enhance the stressors. Also, the link between negative affectivity and strain is significant at the 1 percent level with a standardized coefficient of 0.14. This implies that individuals' experience of strain could be explained by their tendency to evaluate situations more negatively. In other words, with all things constant, individuals who experience higher levels of negative affectivity will report higher levels of strain.

Appendix F

Limitations

Some of the limitations in this study come from the inherent conflict that exists between undertaking a study that is generalizable versus a study that is very specific (for example, with respect to either technologies, or occupations). One of the main limitations of this study is the aggregated and undifferentiated treatment given to the individual's technology use. Individuals responded to the technology characteristics (like usefulness, complexity, reliability, presenteeism, etc.) by aggregating their perceptions across the various ICTs they use. Consequently, an individual might have varying perceptions of usefulness with respect to the use of a mobile phone versus the use of a laptop. However, only one measure of usefulness is collected concerning their overall technology profile. Therefore, there is a lack of clarity on what this usefulness captures. Does it capture the average, or does any one technology from the profile of technologies influence the measure significantly? Although the overall measure we used cannot capture this detail, this approach was deemed an appropriate compromise to administering the research model for each technology. Further, the profile of technologies provided for respondents to evaluate the technology characteristics could be a limitation in itself. This is because there isn't an easy way to categorize the present ICTs into a mutually exclusive and collectively exhaustive manner.

The present study also didn't control for the diversity of technology use. It is possible that individuals who use 10 different technologies for a total of 10 hours could have varied stressful manifestations compared to individuals who use one technology for 10 hours. Just dealing with numerous technologies could be a source of stress. Further, although we believe that critical technology characteristics are considered, the proposed characteristics might not be exhaustive. In addition, as technologies change and new technologies are introduced, it is possible that new characteristics that are not considered might gain significance.

Another fundamental question[2] that might arise is with respect to the constructs of technology characteristics. Since the main contribution of the paper is identifying the technology component in the technostress phenomenon, it is critical to think about how far or how close to technology the technological characteristics (in this study usefulness, reliability, etc.) are. Although at first glance the current technology characteristics might not seem to reflect the technology component, it is useful to think of technology characteristics existing at different levels of abstraction. The lowest level of abstraction could represent the physical reality of the technology and a higher level of abstraction could represent a more logical description of technology (like our technology characteristics). It is our contention that individuals' use of technologies evokes responses at the logical rather than at the physical level of abstraction.

Also, the respondents consisted of individuals from different occupations and organizations. There might be certain organizational and occupational differences that could be investigated. Accordingly, the differentiating effects of profession and occupation could be taken into account in future research. Further, the present study utilized data collected at one point in time. Therefore, it cannot confirm the causality of the links proposed in the model. However, as pointed out by Moore (2000), some of the links between stressors and strain were previously tested longitudinally, and provide some support for the causality proposed in this study. Future research should consider using longitudinal designs. Another factor that might limit discovery of causal links is the field study methodology itself and its ability to isolate ICT effects. Although care was taken to keep the respondents within the bounds of the context (i.e., their use of ICTs), isolating strain or stressors due to ICTs to the exclusion of other causes might not be fully realized. Use of experimental settings might alleviate these concerns.

Finally, this study does not explicitly examine the coping mechanisms that moderate an individual's reactions to stressful situations. Stress research suggests that dispositional (e.g., personality variables, self-efficacy) and contextual variables (e.g., social support) increase the individual's coping ability and thereby act as buffer mechanisms against stressful situations (Cooper et al., 2001). The model developed in the present research paper could be enhanced to include moderating effects of coping. Considering the context of this study, specific constructs that are studied as moderators could be technological self-efficacy and technical support.

[2]We thank a reviewer and the associate editor for these arguments. As noted in the paper, the term *technology characteristics* actually refers to the *assessment of technology characteristics*.

References

Alge, B. J. 2001. "Effects of Computer Surveillance on Perceptions of Privacy and Procedural Justice," *Journal of Applied Psychology* (84:6), pp. 797-804.

Agho, A. O., Price, J. L., and Mueller, C. W. 1992. "Discriminant Validity of Measures of Job Satisfaction, Positive Affectivity and Negative Affectivity," *Journal of Occupational and Organizational Psychology* (65), pp. 185-196.

Ahuja, M. K., Chudoba, K. M., Kacmar, C. J., McKnight, D. H., and George, J. F. 2007. "IT Road Warriors: Balancing Work– Family Conflict, Job Autonomy, and Work Overload to Mitigate Turnover Intentions," *MIS Quarterly* (31:1), pp.1-17.

Ashford, S. J., Lee, C., and Bobko, P. 1989. "Content, Causes, and Consequences of Job Insecurity: A Theory-Based Measure and Substantive Test," *Academy of Management Journal* (32:4), pp. 803-829.

Basil, D. Z., Ridgway, N. M., and Basil, M. D. 2008. "Guilt and Giving: A Process Model of Empathy and Efficacy," *Psychology & Marketing* (25:1), pp. 1-23.

Becker, J., Schwartz, C., Saris-Baglama, R. N., Kosinski, M., and Bjorner, J. B. 2007. "Using Item Response Theory (IRT), for Developing and Evaluating the Pain Impact Questionnaire (PIQ-6TM)," *Pain Medicine* (8), pp. 129-144.

Braunsberger, K., Wybenga, H., and Gates, R. 2007. "A Comparison of Reliability between Telephone and Web-Based Surveys," *Journal of Business Research* (60), pp. 758-764.

Byrne, B. M. 2006. *Structural Equation Modeling with EQS: Basic Concepts, Applications and Programming* (2nd ed.), Mahwah, NJ: Lawrence Erlbaum Associates.

Cheung, G. W., and Rensvold, R. B. 2002. "Evaluating Goodness-of-Fit Indexes for Testing Measurement Invariance," *Structural Equation Modeling* (9:2), pp. 233-255.

Chin, W. W. 1998. "The Partial Least Squares Approach to Structural Equation Modeling," in *Modern Methods for Business Research*, G. A. Marcoulides (ed.), Mahwah, NJ: Lawrence Erlbaum, pp. 295-336.

Cooper, C. L., Dewe, P. J., and O'Driscoll, M. P. 2001. *Organizational Stress*, Thousand Oaks, CA: Sage Publications.

Delone, W. H., and McLean, E. R. 1992. "Information Systems Success: The Quest for the Dependent Variable," *Information Systems Research* (3:1), pp. 60-95.

DeLone, W. H., and McLean, E. R. 2003. "The DeLone and McLean Model of Information System Success: A Ten-Year Update," *Journal of Management Information Systems* (19:4), pp. 9-30.

Du, S., Bhattacharya, C. B., and Sen, S. 2007. "Reaping Relational Rewards from Corporate Social Responsibility: The Role of Competitive Positioning," *International Journal of Research in Marketing* (24), pp. 224-241.

Eddy, E. R., Stone, D. L., and Stone-Romero, E. F. 1999. "The Effects of Information Management Policies on Reactions to Human Resource Information Systems: An Integration of Privacy and Procedural Justice Perspectives," *Personnel Psychology* (52), pp. 335-358.

Fornell, C., and Larker, D. F. 1981. "Evaluating Structural Equation Models with Unobservable Variables and Measurement Error," *Journal of Marketing Research* (18), pp. 39-50.

Hicks, D., Pivarnik, L., and McDermott, R. 2008. "Consumer Perceptions About Seafood – An Internet Survey," *Journal of Foodservice* (19:4), pp. 213-226.

Hu, L., and Bentler, P. 1999. "Cutoff Criteria for Fit Indexes in Covariance Structure Analysis: Conventional Criteria Versus New Alternatives," *Structural Equation Modeling* (6), pp. 1-55

Jex. S., and Beehr, T. 1991. "Emerging Theoretical and Methodological Issues in the Study of Work-Related Stress," in *Research in Personnel and Human Resources Management*, G. R. Ferris and K. M. Rowland (eds.), Stamford, CT: JAI Press Inc., pp. 311-365.

Jiang, J. J., Klein, G., and Carr, C. L. 2002. "Measuring Information System Service Quality: SERVQUAL from the Other Side," *MIS Quarterly* (26:2), pp. 145-166.

Kreiner, G. E. 2006. "Consequences of Work–Home Segmentation or Integration: A Person–Environment Fit Perspective," *Journal of Organizational Behavior* (27), pp. 485-507.

Liang, H., Saraf, N., Hu, Q., and Xue, Y. 2007. "Assimilation of Enterprise Systems: The Effect of Institutional Pressures and the Mediating Role of Top Management," *MIS Quarterly* (31:1), pp. 59-87.

Little, T. D. 1997. "Mean and Covariance Structures (MACS), Analyses of Cross-Cultural Data: Practical and Theoretical Issues," *Multivariate Behavioral Research* (32), pp. 53-76.

Lynn, M. 2009. "Individual Differences in Self-Attributed Motives for Tipping: Antecedents, Consequences, and Implications," *International Journal of Hospitality Management* (28:3), pp. 432-438.

Moore, G. C., and Benbasat, I. 1991. "Development of an Instrument to Measure the Perceptions of Adopting an Information Technology Innovation," *Information Systems Research* (2:3), pp. 192-222.

Moore, J. 2000. "One Road to Turnover: An Examination of Work Exhaustion in Technology Professionals," *MIS Quarterly* (24:1), pp. 141-168.

Netemeyer, R. G., Boles, J. S., and McMurrian, R. 1996. "Development and Validation of Work–Family Conflict and Family–Work Conflict Scales," *Journal of Applied Psychology* (81), pp. 400-409.

Perrewe, P., and Zellars, K. 1999. "An Examination of Attributions and Emotions in the Transactional Approach to the Organizational Stress Process," *Journal of Organizational Behavior* (20), pp. 739-752.

Petter, S., Straub, D., and Rai, A. 2007. "Specifying Formative Constructs in Information Systems Research," *MIS Quarterly* (31:4), pp. 623-656.

Piccolo, R. F., and Colquitt, J. A. 2006. "Transformational Leadership and Job Behaviors: The Mediating Role of Core Job Characteristics," *Academy of Management Journal* (49:2), pp. 327-340.

Pinsonneault, A., and Heppel, N. 1997. "Anonymity in Group Support Systems Research: A New Conceptualization, Measure, and Contingency Framework," *Journal of Management Information Systems* (14:3), pp. 89-108.

Podsakoff, P., MacKenzie, S., Lee, J., and Podsakoff, N. 2003. "Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies," *Journal of Applied Psychology* (88:5), pp. 879-903.

Rogers, T., and Bazerman, M. H. 2008. "Future Lock-In: Future Implementation Increases Selection of 'Should' Choices," *Organizational Behavior and Human Decision Processes* (106:1), pp. 1-20.

Shang, J., Basil, D. Z., and Wymer, W. 2010. "Using Social Marketing to Enhance Hotel Reuse Programs," *Journal of Business Research* (63:2), pp. 166-172.

Thau, S., Bennett, R. J., Mitchell, M. S., and Marrs, M. B. 2009. "How Management Style Moderates the Relationship between Abusive Supervision and Workplace Deviance: An Uncertainty Management Theory Perspective," *Organizational Behavior and Human Decision Processes* (108:1), pp. 79-92.

Wallenstein, G. V., Blaisdell-Gross, B., Gajria, K., Guo, A., Hagan, M., Kornstein, S. G., and Yonkers, K. A. 2008. "Development and Validation of the Premenstrual Symptoms Impact Survey (PMSIS): A Disease-Specific Quality of Life Assessment Tool," *Journal of Women's Health* (17:3), pp. 439-450.

Weiss, A. M., and Heide, J. B. 1993. "The Nature of Organizational Search in High Technology Markets," *Journal of Marketing Research* (30:2), pp. 220-233.

Wonder, N., Wilhelm, W., and Fewings, D. 2008. "The Financial Rationality of Consumer Loan Choices: Revealed Preferences Concerning Interest Rates, Down Payments, Contract Length, and Rebates," *The Journal of Consumer Affairs* (42:2), pp. 243-270.

Yang, M., Wallenstein, G., Hagan, M., Guo, A., Chang, J., Kornstein, S. 2008. "Burden of Premenstrual Dysphoric Disorder on Health-Related Quality of Life," *Journal of Women's Health* (17:1), pp. 113-121.

Zoomerang. 2009. "Survey Respondents: Profile Reference Book," Zoomerang, San Francisco, CA (available online at http://www.zoomerang.com/resources/Panel_Profile_Book.pdf).