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Influence of Post-Survey Action on Current Survey Responses

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Survey respondents who perceive action was taken based on survey results respond more favorably to subsequent surveys (Church & Oliver, 2006). We investigate whether measurement invariance exists on constructs being measured as a result of perceived action. Results support invariance for some, but not all survey constructs.

Organizations commonly gather information from their employees via organizational surveys for a variety of purposes (Kraut, 1996; 2006). However, the pervasive administration of surveys with little feedback or resultant action can lead to negative employee attitudes (e.g., Church & Oliver, 2006) and may decrease the likelihood of individuals participating in future surveys due to perceived diminished value of surveys (e.g., Baruch, 1999; Rogelberg, Fisher, Maynard, Hakel, & Horvath, 2001). While previous research has shown the importance of providing employees with survey feedback (e.g., Bowers, 1973; Conlon & Short, 1984), less attention has been given to the effect of taking visible (i.e., perceived) action based on survey responses. Recently, Church and Oliver (2006) found that employees of organizations that provided both survey feedback and took visible action based on the survey results, reported higher satisfaction than employees who did not receive feedback and did not observe visible action being taken. While it seems that taking action based on organizational survey data may improve attitudes such as overall satisfaction (Church & Oliver, 2006), it is not known whether these differences in attitudinal outcomes related to survey feedback are indicative of meaningful changes in employee attitudes. Instead, observed differences could be due to a shift in the employee's understanding of the survey items, perhaps as a result of a perceived intervention.

The purpose of the present study is to further explore Church and Oliver's (2006) findings by assessing the psychometric properties of an organizational climate survey. First, we examined the measurement invariance of climate perceptions for persons perceiving action and those perceiving a lack of action in response to a previous organizational survey. Next, we examined whether individuals who

perceived action based on survey responses had more favorable climate perceptions than those that did not perceive action (cf. Church & Oliver, 2006). By first testing the measurement invariance of the survey, we can determine if differences in climate perceptions between the two groups are based on actual differences in the constructs measured, or if differences are an artifact of a lack of invariance of the survey.

Employee Surveys

Employee surveys are a valuable tool for gathering information in order to direct change initiatives within organizations (Kraut, 1996). Implementing a survey involves several stages, including planning, data collection and analysis, feedback, and implementation based on survey results (Nadler, 1977). While each step is important, it is especially crucial that feedback is provided and change initiatives are implemented (Burke, Coruzzi, & Church, 1996; Nadler, 1977). These latter stages are often overlooked as leaders in an organization may believe that the act of distributing surveys constitutes implementing action (Church & Waclawski, 2001). Employees may develop negative attitudes, which can worsen over time if surveys are distributed without feedback and visible action (Church & Oliver, 2006; Hinrichs, 1996; Kraut & Saari, 1999). These negative attitudes may be attributed to feelings that the organization does not truly value employee opinions strongly enough to initiate change based on survey responses (Church & Oliver, 2006).

Feedback and Visible Action

Feedback is also important so that employees can help initiate change within the organization. Feedback allows employees to be aware

of the perceptions of others within the organization and allows them to work with leaders to initiate change (Bowers, 1973; French & Bell, 1978; Nadler, 1977; Scarpello & Vandenberg, 1991). While organization leaders sometimes believe that providing employees with feedback will “automatically lead to improvements in scores over time” (Church & Oliver, 2006; p. 104), not taking action can produce negative attitudes among employees. Moreover, perceptions of change interventions are as important as their implementation (Hinrichs, 1996).

Although taking action is crucial to the success of the survey process, there is often a lack of distinction between providing feedback and taking action within survey process models (Cummings & Huse, 1989). This is unfortunate as treating these steps in the survey process as two related, yet distinct, areas within a change initiative are important (e.g., Nadler, 1977; Solomon, 1976). Church and Oliver (2006) underscore the distinction of these two steps as separate entities by showing that organizations that take action based on survey responses produce more satisfied employees than organizations that only provide feedback. Interestingly, Church and Oliver (2006) found no differences in percentage favorable attitudes between organizations that provided feedback with no action taken and organizations that did not provide feedback and did not take action. Thus, the importance of taking action based on survey responses is readily apparent.

Detecting Measurement Invariance

Positive changes in employee attitudes occur based on taking action through survey responses (see Church & Oliver, 2006). However, without first testing the measurement properties of the survey itself, it is unknown if these positive changes are the result of actual attitude changes, or the result of a shift in employees’ understanding of the meaning of the survey items or a recalibration of the survey scale. Thus, it is imperative to test for measurement invariance to determine whether the act of perceiving survey follow-up action caused a change in the perception of the constructs or response scales being measured in the survey.

Measurement invariance (MI) can be considered the degree to which measurements conducted under different conditions yield equivalent measures of the same attributes (Drasgow, 1987; Horn & McArdle, 1992). CFA tests of MI involve fitting a series of nested sequential measurement models to two or more data samples. Typically, in the first model, both groups are examined simultaneously, holding only the pattern of factor

loadings invariant. In other words, the same items are forced to load onto the same factors, but factor loading estimates themselves are allowed to vary between samples. This baseline model provides a chi-square value that reflects model fit for item parameters estimated separately for each group. It also constitutes a test of configural invariance (Vandenberg & Lance, 2000) such that if the model does not fit in both groups, the overall factor structure is said to differ and invariance does not exist.

Next, a test of factor loading invariance (metric invariance; Horn & McArdle, 1992) is conducted by examining a model identical to the baseline model except that the matrix of factor loadings is constrained to be equal across groups (Meredith, 1993; Millsap, 1997). The difference between the baseline and more restricted model is expressed as a chi-square statistic with degrees of freedom equal to the number of constrained parameters. Subsequent to tests of factor loading equality, several additional model parameters may also be tested for MI, such as item intercepts (scalar invariance) and uniqueness terms (see Vandenberg & Lance, 2000 for a review).

This paper seeks to further examine Church and Oliver’s (2006) findings regarding the importance of taking action with personnel surveys. The purpose of the present study is twofold:

First, we will examine the measurement invariance of an organizational survey between employees that perceived action was taken based on the previous survey and employees that did not perceive action was taken. More specifically, we will determine whether configural, metric, or scalar invariance occurred to examine whether the intervention (i.e., perception of action being taken) changed the way respondents viewed survey items or response scales, or if it truly changed the magnitude of their attitudes. Second, we will determine if the perception of the organization taking action results in more favorable climate perceptions among individuals who perceived action compared to those employees who did not perceive visible action being taken based on survey responses. Given Church and Oliver’s (2006) findings, we propose:

Hypothesis 1: Individuals who perceive action was taken based on previous surveys will have more favorable climate perceptions in the current survey than those who perceived that action was not taken.

Method

Participants and Procedure

Employees were 661 members of a large military organization where employees were military, civilian, and contract personnel. Seventy-six percent of the participants were male. With regard to ethnicity, 68.5% of the sample was Caucasian, 16.2% was African American, 5.7% was Hispanic, 2.2% was Asian, and 6.9% selected another ethnicity. All respondents completed the command climate survey as part of an ongoing organizational effectiveness and change effort. Responses were collected anonymously using an online survey tool over a period of two weeks. The response rate for the organization was 77%, and the respondents were demographically representative of the overall organization.

Measures

Participants were asked to respond to a survey containing questions related to the command climate in their organization. Additionally, two follow-up questions, measuring perceived feedback and action related to the previous year's survey, were included: "I was made aware of the results from the 2003 Command Climate Survey" and "Meaningful changes were initiated in my directorate based on the 2003 Command Climate Survey." Both items were assessed with a five point (Strongly Disagree-Strongly Agree) Likert-type scale. A Not Applicable option was also available though those respondents ($n = 92$) were removed from further analyses. The remaining participants were sorted into two groups based on whether they perceived action or not, using a mean split ($M=3.49$; $n_{low}=243$, $n_{high}=257$).

Survey Dimensions

Prior to assessing measurement invariance, we verified the dimensionality of the survey using exploratory factor analysis (EFA) with principal axis extraction and oblique factor rotation. The EFA demonstrated that five constructs were present in the survey: Senior Leadership (7 items, $\alpha = .95$) refers to perceptions of senior leaders fulfilling their roles and responsibilities in the organization and providing leadership for employees. Team Cohesion (7 items, $\alpha = .90$) is the degree to which the participant's workgroup functions well as a team. Communications (4 items, $\alpha = .82$) is the degree to which information is freely exchanged within the organization. Personnel Management (7 items, $\alpha = .93$) reflects the effectiveness of personnel policies and practices within the organization, and Immediate Supervision (9 items, $\alpha = .96$) is the degree to which the participant's supervisor engages in effective management behaviors. Composite scores for each factor were used for all further analyses.

Assessing Measurement Invariance

In order to assess the invariance of the five factors, a series of multi-group CFA models were estimated in which persons perceiving action and those not perceiving action constituted the two groups. In the first model, the five factors were specified as latent traits using their corresponding items as indicators. In this baseline model, factor loadings, item intercepts, factor variances and covariances, and latent means were freely estimated in the two groups. In order to achieve model identification and scaling, factor loadings and item intercepts were fixed for the first indicator for each factor. Note that this model constitutes a test of the equality of factor structure across groups (i.e., configural invariance; Horn & McArdle, 1992) such that if the model fits poorly when estimated in the two groups, invariance is said to not exist.

If the baseline model fits the data (i.e., configural invariance exists), a constrained model will be fit to the data such that the factor loadings for like items for the two groups will be constrained to be equal. The decrement in model fit between this more constrained model and the baseline model will be evaluated using a difference in chi-square test. If factor loadings for the two groups are significantly different, a series of five follow-up analyses will be conducted in which the factor loadings for only one factor are constrained to be equal across groups. The fit of each of these models will be compared to the baseline using a chi-square difference test.

Finally, group means will be compared to determine if those who perceived action have more favorable perceptions of command climate with respect to the five dimensions of the survey. Note that this step will be performed only in the case that metric invariance is found.

Results

Invariance Analyses

The baseline model, in which the five factors were jointly fit in the two groups, fit quite well (see Table 1), supporting configural invariance across groups. Metric invariance tests indicated that there were differences in factor loadings across groups (see Table 1). As a result, we evaluated the invariance of each of the five factors independently. As can be seen in Table 1, only the Communications and Team Cohesion factors had significantly different factor loadings in the two groups. Given the lack of metric invariance for two of the five scales, we did not conduct further MI tests.

Effect of Perceived Action on Climate Attitudes

Hypothesis 1 predicted that survey respondents who perceived that action was taken as a result of the previous survey would have more favorable perceptions of the command climate in the current survey. The Senior Leadership, Personnel Management, and Immediate Supervision dimensions were found to have invariant factor loadings based on perceived action. Thus, it was appropriate to compare the mean levels of agreement for these dimensions to determine if perceived action had a positive effect on the participants' perceptions. Independent samples t-tests demonstrated that those who perceived action had significantly more favorable attitudes on each of the three dimensions (see Table 2).

Discussion

Although critically important to the success of survey initiatives, taking action based on survey feedback is an often overlooked step in the survey process (Church & Oliver, 2006). While previous research has demonstrated the positive effects of providing survey feedback and implementing follow-up actions on the favorability of subsequent survey responses (Church & Oliver, 2006), no research to date has examined the measurement invariance of subsequent survey responses between groups who perceived action following a previous survey and those who did not. This test for measurement invariance is a prerequisite for comparing and meaningfully interpreting any differences between the groups.

Measurement invariance results indicated that configural invariance exists between those individuals who perceived action being taken on the command climate survey and those who did not. Thus, perceiving or not perceiving action following a previous survey intervention did not have an impact on how respondents conceptualized the survey dimensions (which items are related to which factors) on a subsequent survey.

Further analyses revealed three of the five scales—Personnel Management, Immediate Supervision, and Senior Leadership—exhibited metric invariance. Factor loadings were found to be equal across the two groups, thus the contribution of the items to the definition of the construct were the same. This allowed us to test for and meaningfully interpret mean differences between groups. Mean comparisons for the Personnel Management, Immediate Supervision, and Senior Leadership dimensions revealed that participants who perceived action following a previous survey intervention were significantly more favorable in their responses than those who did not perceive action. In three areas of

organizational climate, it appears that perceiving action does impact the favorability of responses, supporting Church and Oliver (2006).

Team Cohesion and Communication did not demonstrate metric invariance and could not be examined for mean differences between groups. This lack of equivalence is significant as it suggests that perceiving action impacted the “mental model” of how those respondents viewed the contribution of facets (i.e., items measure facets of the construct definition) to the definitions of the Team Cohesion and Communications constructs. It is unlikely that perceptions of action being taken in general would have created such a shift in these two constructs without doing so for all five. Therefore, one possible explanation is that specific interventions or actions perceived in these areas influenced respondents' perceptions. Although there is no conclusive link, a number of work groups in the organization participated in post-survey activities that could be considered communications and team cohesion interventions. Although the Team Cohesion and Communication findings do not support the comparison of response favorability, they suggest that organizational interventions can affect attitudes.

Examining the measurement invariance of survey dimensions is a crucial step in determining if differences between groups can meaningfully be interpreted. However, these analyses are rarely performed in survey practice or research, and mean comparisons are often made with the assumption that the psychometric properties of the scale are adequate to meaningfully interpret the data (Vandenberg & Self, 1993). Failing to establish equivalence results in ambiguity as to whether mean differences are due to actual changes in the construct being measured, or if shifts have occurred in the meanings of the constructs or calibration of scale points between the groups.

Our results have important implications for interpretations in Church & Oliver's (2006) study. That is, while the authors reported that those individuals who perceived action being taken responded more favorably on a subsequent survey, results from the current study suggest caution is in order when interpreting these differences. Even if our study results had indicated more favorable perceptions of Team Cohesion and Communication by those who perceived action, these differences could not have been meaningfully interpreted due to a lack of measurement invariance found between those individuals who did and did not perceive action. However, a lack of metric invariance constitutes some shift in attitudes themselves (Vandenberg & Self, 1993). Statistically significant and interpretable mean differences were found between individuals who perceived and those who

did not perceive action for three constructs, supporting the findings of Church and Oliver (2006). Taken together, the results are encouraging because they suggest that taking action can influence future perceptions.

Future research is needed to understand why some survey constructs are invariant across groups and others are not. This research should investigate salient contextual factors that likely influence measurement invariance, such as different types of organizational interventions, quality of feedback, leader visibility, and leader commitment to the survey and organizational improvement. At a more basic level, more research is needed on survey measurement properties and on how survey feedback and perceived action impact subsequent attitude formation. Finally, research is needed to determine the best way to present and use survey results that do not exhibit measurement invariance.

To conclude, the lack of metric equivalence found in our study has important implications for survey practice. It demonstrates the need to compare the measurement invariance on organizational surveys between groups before making mean and descriptive comparisons (cf. Dierdorff, Surface, Meade, Thompson, & Martin, 2006). Given that organizational surveys are one of the most pervasive human resource practices in the modern organization and that there is very little evidence to suggest survey professionals are establishing measurement invariance before providing feedback to clients, many organizations could be making ineffective decisions based on survey data. Appropriate interpretations of the data are needed to ensure effective decisions are made that will help the organization achieve its objectives. Finally, one important implication should not be lost in the methodological discussion. Organizational leaders should ensure that appropriate feedback is given to employees, and more importantly, that action is taken based on that survey feedback. Doing so completes the survey process and may decrease the negative attitudes among employees who believe their survey responses are not put to good use in settings where feedback is not given and action is not taken (Hinrichs, 1996; Kraut & Saari, 1999).

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Table 1

Metric Invariance Statistics

	<i>RMSEA</i>	<i>CFI</i>	<i>TLI</i>	<i>NFI</i>	X^2	ΔX^2	Δdf
Baseline	.08	.97	.97	.96	2654.82		1034
Metric invariance (all factors)	.08	.97	.97	.96	2710.12	55.30**	29
Personnel Management	.08	.97	.97	.96	2661.63	6.81	6
Senior Leadership	.08	.97	.97	.96	2656.76	1.94	6
Team Cohesion	.08	.97	.97	.96	2669.52	14.70*	6
Communication	.08	.97	.97	.96	2672.67	17.85**	3
Immediate Supervision	.08	.97	.97	.96	2669.25	14.43	8

* = $p < .05$; ** = $p < .01$

Note. CFI = comparative fit index; TLI = Tucker-Lewis index (also known as the non-normed fit index); NFI = Normed Fit Index RMSEA = root mean square error of approximation. Fit statistics in excess of .95 indicate adequate fit for the CFI, NFI, and TLI, while fit statistics less than 0.08 indicate better fit for the RMSEA (Hu & Bentler, 1999).

Influence of Post-Survey Action

Table 2

Effect of Perceived Action on Climate Perceptions

Climate Dimension	M_{low}	M_{high}	$SE(D)$	t
Personnel Management	3.52	4.33	0.07	-12.49**
Senior Leadership	3.56	4.47	0.07	-13.18**
Immediate Supervision	3.86	4.46	0.06	-8.12**

Note: ** = Effect is significant at $p < .001$

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