A new approach to psychological measures in leadership research

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The semantic theory of survey responses casts doubt on the prevalent use of surveys in leadership research, write Jan Ketil Arnulf and colleagues.

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Is survey data a source of new information, or could surveys just be begging their questions? Organizational behavior is a field in psychology that relies heavily on surveys as research method. Theories about motivation, leadership and general workplace behaviors are frequently tested by asking managers and employees to fill out questionnaires. The data are then analyzed in complex statistical models, and usually interpreted as expressions of the underlying constructs. We have been suspecting that such data do not reflect attitudes to workplace phenomena. Instead, they may just be assessments of the similarity of the language in the applied items.

Related variables such as economic exchange, intrinsic motivation, organizational citizenship behavior (OCB), work effort, turnover intention, and job satisfaction were also included. The semantic values were compared to the observed statistics from human respondents in four large samples.

Determined by semantics

The main finding was that the observed statistics were predictable a priori from the semantic properties of the items. By the most conservative estimate, semantics explained 79% of the variance in the inter-item correlation matrix of the MLQ. Depending on assumptions, semantics could explain as much as 86% of the variance. Similarly, in a large sample surveyed for transformational leadership, LMX, the Ohio State 2-factor theory, as well as motivational variables, semantics explained between 47 and 87% of the variation.

Moreover, it seems that mediational relationships may also be determined by semantics. In a commonly applied regression model, intrinsic motivation was found to mediate between transformational leadership and outcome variables such as work effort and OCB. These relationships were also mutually explainable through semantics. Only in the case of the NEO Personality Inventory did semantic values fail to explain a significant part of the variation.

Our findings cast doubt on the prevalent use of surveys as research methods in this field because semantics (similarity in item content) is only supposed to play a role in the within-scale variation. Relationships between different variables should ideally be caused by patterns in the attitude strength of respondents. To ensure this, methodologists recommend various types of factor analysis to demonstrate that the scales are relatively independent and not inherently correlated (Nunnally & Bernstein, 2010).

As expected, we found that intra-scale relationships (measured by Cronbach's alpha) were semantically determined. However, we could also show that the same semantic relationships pervaded into all meaningful relationships among the leadership and organizational behavior variables. Confirmatory factor analysis could neither detect nor prevent this, as better fit indices were associated with more obvious semantic determination of data patterns.

Four consequences

These findings may have some alarming consequences for prevalent methodologies in leadership research. First, the semantic patterns are properties of items involved a priori in obtaining responses. If the item correlation matrices are largely caused by the language recognition of respondents, the emerging statistical patterns really don't tell us anything we didn't know already (Smedslund, 1994).

Second, as theoretically argued (Van Knippenberg & Sitkin, 2013), it seems that many variables in leadership research have tautological relationships. As we could show in all three samples, the values of outcome variables were already given by their semantic relationships to the independent variables, suggesting some theoretical confounding in the basic concepts used. As two of the authors show in another empirical study, language links leadership to other phenomena also, such as heroism, in ways that are difficult to entangle by survey research (Arnulf & Larsen, 2015).

Third, the prevalent statistical modeling techniques used to demonstrate variable independence seem inadequate to this purpose, a possible explanation for the frequently observed levels of common method variance in leadership research (Podsakoff, MacKenzie, & Podsakoff, 2012).

A fourth and illustrating consequence concerns the cross-cultural validity of survey data. The crucial point in semantic relations is that they only reflect what is proposed by the linguistic structure of the sentence. If similarities in survey correlation matrices are observed across languages, it merely means that the survey was correctly translated. In our case, the items were fed into the text analytical algorithms in American English, but the respondents were all Norwegians responding to Norwegian versions of the surveys. This issue casts doubt about inferences from cross-cultural survey data as these merely show how the same statements are expressible across languages. Such data provide no information about how actual

behavioral interactions are comparable, such as leadership or employee behavior across cultural divides. This possibility has also been proposed by psychological theories exploring the discrepancy between attitudes, language, thought, and action (Gollwitzer & Sheeran, 2006; Parks-Stamm, Oettingen, & Gollwitzer, 2010; Prinz, Aschersleben, & Koch, 2009).

A new approach to psychological measurements

Finally, we believe that our study offers a new approach to understand why some psychological measurements carry more predictive value for future behaviors or effects than others. Mere compliance with semantic structures in surveys could be a reason why some instruments show appropriate psychometric properties but little predictive validity (Bing, LeBreton, Davison, Migetz, & James, 2007). In our study, the five-factor model did not seem strongly influenced by semantics, but is known to be predictive of a number of life events ranging from health to career success (McCrae & Costa, 2004).

We understand that our findings and claims may be counterintuitive and problematic to some, and welcome debate about these topics. Concomitantly, our findings are a product of technologies in digital text analysis that have emerged in recent decades and are continually being refined. With the advent of such technologies in information search and knowledge storing, our study is probably just the beginning of new methodological approaches that will complement the standard statistical methods in use. We believe this is a promising path for the revitalization of the empirical foundations of leadership research.

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Abstract

A new approach to psychological measures in leadership research

Is survey data a source of new information, or could surveys just be begging their questions? The authors of this opinion piece suspect that survey data in leadership research do not reflect attitudes to workplace phenomena. Instead, they may just be assessments of the similarity of the language in the applied items. In a recent article in the journal PLOS ONE, this possibility was tested in a new theory called the semantic theory of survey responses (STSR). In a follow-up study, language links leadership to other phenomena such as heroism, in ways that are difficult to

entangle by traditional survey research.

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This article is an opinion piece.

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