

Agitation over aggregation: Clarifying the development of and the nature of the GLOBE scales

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Abstract

Peterson and Castro [Peterson, M.F. and Castro (2006-this issue). Measurement metrics at aggregate levels of analysis: Implications for organization culture research and the GLOBE project. *The Leadership Quarterly*, 17, 506–521.] have presented a critique of the GLOBE societal and organizational culture scales. In this article, we clarify what we believe to be misinterpretations on the part of Peterson and Castro, and also rebut several of their assertions about the appropriate techniques for the creation of scales to assess constructs at group levels of analysis.

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Peterson & Castro (2006-this issue) have presented a critique of the societal and organizational culture scales created by and used in Project GLOBE, with a particular focus on the way those scales were created. In this article, we clarify what we believe to be misinterpretations on the part of Peterson and Castro, and also rebut several of their assertions about the appropriate techniques for the creation of scales to assess constructs at group levels of analysis. Specifically, Peterson and Castro identified two different approaches to the development of scales in the organizational and cross-cultural literature. They indicated that organizational researchers have emphasized aggregation issues over issues surrounding the factor structure of their scales at the higher level (e.g., organizational or societal) of analysis. As a result, these researchers typically develop their scales by assessing the reliability and factor structure of scales at the individual level of analysis and then aggregating the scale composite score to the targeted level of analysis. Peterson and Castro label this scale development protocol the *create individual-level scales and aggregate* (ILSA) approach.

In contrast to this approach, Peterson and Castro indicate that cross-cultural researchers use the *create aggregate items, create aggregate scales* (CSA) approach. In the CSA approach, researchers aggregate items to the targeted level (i.e., societal) of analysis and then create their scales by combining the aggregated item into a composite score. Cross-cultural researchers tend to pay more attention to the psychometric properties and the factor structure of this aggregated composite scale than focus on aggregation justification issues. Peterson and Castro claim that the consequences of ignoring such questions are minimal since an aggregated factor structure would not emerge if the aggregation of the items could not be justified in the first place.

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Finally, Peterson and Castro suggest a third approach, called the *create individual-level scales, aggregate, create aggregate scales* (ILSA/CSA) approach. This third approach, they argue, resolves some of the inconsistencies between the two previous approaches.

As a way to illustrate these different approaches to developing scales, Peterson and Castro discuss the scale development procedure used in the GLOBE project (House, Hanges, Javidan, Dorfman, & Gupta, 2004) as well as a recent article by Dickson, Resick, and Hanges (2006-this volume). While the GLOBE scales and the Dickson et al. scales were developed so that they measured organizational- and societal-level culture or leadership perceptions, Peterson and Castro claimed that we followed the wrong scale development procedure to achieve this objective. In particular, while the stated objectives for the GLOBE scales were consistent with the CSA approach, Peterson and Castro claim that GLOBE and Dickson et al. followed the ILSA approach and thus created individual-level metrics.

It appears that in developing their argument, Peterson and Castro rely completely on what gets aggregated (i.e., items or composite scores) to reach their conclusion about the individual-level nature of the GLOBE scales. Specifically, they state:

However, the main issue in the present analysis is not about how GLOBE followed the organizational literature to justify the aggregation of individual level scales. Instead, the issue is that GLOBE's focus is on aggregating individual level scales rather than constructing scales based on aggregated items. The main point of ambiguity is that when the GLOBE group emphasizes its purpose of developing organizational and societal measures, their insistence that the measures are not appropriate for individual level research suggests that they wished to evaluate their measures based on organizational and societal level metric structures (Hanges & Dickson, 2004, pp. 124, 146).

This quote highlights the critical importance that Peterson and Castro place on what is aggregated (i.e., scales or items) for determining the measurement properties of a scale. Further, Peterson and Castro state:

The GLOBE authors show an interest in realizing the project's potential to create organization-level and society-level measures rather than individual-level measures (Hanges & Dickson, 2004, pp. 124, 127, 146). The analyses used also show an awareness of both the organizational culture and societal culture literatures about aggregation, albeit a somewhat confused awareness.

and that we used:

the term 'convergent-emergent' constructs to describe their measures (Hanges & Dickson, 2004, p. 124), but the logic of the measure development shows a mixture of unclarity about what the project did and confusion about what the project could do to create measures.

We disagree with both Peterson and Castro's description of the process used to develop the GLOBE scales as well as their conclusions about the nature of the GLOBE scales. Thus, we will accomplish two broad objectives in this paper. First, we will clarify the scale development process used in GLOBE to clarify the GLOBE scale development procedure and demonstrate that Peterson and Castro description of the process is inaccurate. Second, we disagree with Peterson and Castro's belief in the diagnostic value of knowing whether items or scales were aggregated for determining the measurement properties of a scale. Indeed, we will show that whether items are first aggregated and then the composite scale score is computed, as done in the CSA approach, or whether the composite scale score is first created and then aggregated, as done in the ILSA approach, does not affect the nature of the composite scale score at all. Rather, what is critical is that the researchers are able to demonstrate that their scales have an appropriate factor structure at the desired level of analysis.

We believe that Peterson and Castro's statements about the individual-level nature of the GLOBE scales are based partly on a misreading of the GLOBE scale construction process discussed in Hanges & Dickson (2004). Some of their conclusions are probably attributable to some vagueness in the description of the scale development process due to over-editing of that chapter. However, Peterson and Castro's misinterpretation of the GLOBE scales also appears to be due to their undue focus on the two initial empirical assessments of the scales ($k=28$ countries and $k=15$ countries, respectively), and their lack of attention to the final scale-development analyses conducted on the large phase 2 data ($k=62$ cultures). We will provide evidence in this paper that the GLOBE scales measure and are appropriately influenced by organizational- and/or societal-level variability. We appreciate the opportunity provided by Jerry Hunt (special editor of this issue) and Mike Mumford (editor of *The Leadership Quarterly*) to reply with our own thoughts

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