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Within- and between-person and group variance in behavior and beliefs in cross-cultural longitudinal data[★]

Kirby Deater-Deckard ^{a,*}, Jennifer Godwin ^b, Jennifer E. Lansford ^b, Dario Bacchini ^c, Anna Silvia Bombi ^d, Marc H. Bornstein ^e, Lei Chang ^f, Laura Di Giunta ^d, Kenneth A. Dodge ^b, Patrick S. Malone ^b, Paul Oburu ^g, Concetta Pastorelli ^d, Ann T. Skinner ^b, Emma Sorbring ^h, Laurence Steinberg ^{i,j}, Sombat Tapanya ^k, Liane Peña Alampay ^l, Liliana Maria Uribe Tirado ^m, Arnaldo Zelli ⁿ. Suha M. Al-Hassan ^{o, p}

- ^a University of Massachusetts Amherst, Amherst, MA, USA
- ^b Duke University, Durham, NC, USA
- ^c Second University of Naples, Caserta, Italy
- ^d Università di Roma "La Sapienza", Rome, Italy
- ^e Eunice Kennedy Shriver National Institute of Child Health and Human Development, Bethesda, MD, USA
- ^f University of Macau, China
- g Maseno University, Maseno, Kenya
- ^h University West, Trollhättan, Sweden
- ⁱ Temple University, Philadelphia, PA, USA
- ^j King Abdulaziz University, Jeddah, Saudi Arabia
- ^k Chiang Mai University, Chiang Mai, Thailand
- ¹ Ateneo de Manila University, Quezon City, Philippines
- ^m Universidad San Buenaventura, Medellín, Colombia
- ⁿ University of Rome "Foro Italico", Rome, Italy
- ^o Hashemite University, Zarqa, Jordan
- P Emirates College for Advanced Education, Abu Dhabi, United Arab Emirates

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ABSTRACT

This study grapples with what it means to be part of a cultural group, from a statistical modeling perspective. The method we present compares within- and between-cultural group variability, in behaviors in families. We demonstrate the method using a cross-cultural study of adolescent development and parenting, involving three biennial waves of longitudinal data from 1296 eight-year-olds and their parents (multiple cultures in nine countries). Family members completed surveys about parental negativity and positivity, child academic and social-emotional adjustment, and attitudes about parenting and adolescent behavior. Variance estimates were computed at the cultural group, person, and within-person level using multilevel models. Of the longitudinally consistent variance, most was within and not between cultural groups—although there was a wide range of between-group differences. This approach to quantifying cultural group variability may prove valuable when applied to quantitative studies of acculturation.

E-mail address: kdeaterdeck@umass.edu (K. Deater-Deckard).

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^{*} Corresponding author. Department of Psychological and Brain Sciences, Tobin Hall, 135 Hicks Way, University of Massachusetts, Amherst, MA, 01003, USA

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1. Introduction

Acculturation is a complex intra- and inter-personal process by which an individual who comes into contact with one or more additional cultures modifies her or his own behaviors, beliefs and self-construals (including identity) in response to the experience in ways that may be adaptive or maladaptive (Bornstein, 2017; Sam & Berry, 2010). Ward and Geeraert (2016) recently offered a highly articulated framework to conceptualize, measure, and test competing hypotheses about acculturation processes that involves the individual's heritage/home culture, the settlement/host culture, and global culture. Of relevance for the current paper, Ward and Geeraert (2016) placed a strong emphasis on family context and relationships, and psychosocial adjustment and well-being, as essential elements of understanding the acculturation process.

The emphasis in the current paper is not on defining, measuring, or statistically testing acculturation. Instead, our goal is to provide an example of an efficient and thorough quantitative approach that we hope will be useful in future studies of acculturation processes. Our example utilizes data analysis of a cross-cultural longitudinal study of child and adolescent development in 12 "cultural groups" in nine countries. (Note that we use the term "cultural group" in the present study to describe the samples that we assessed at each site around the globe; as we describe in the Method section, the sites varied in how culturally homogeneous and representative they were of the broader cultural and geographic context). The approach we present is useful because it permits researchers to address the relative proportions of variation in constructs of interest (in our case, parent and youth behavioral constructs as well as some constructs capturing beliefs)—between-group, within-group, and within-person (over time). Estimating and comparing these "pockets" of variability across a broad range of constructs can enhance researchers' understanding of what it means to be a member of a group, to be an individual within that group, and to change over time following experiences. Our data were not collected to develop new measurement approaches for acculturation research and do not capture change following inter-cultural interaction. However, we believe our longitudinal, cross-cultural study design and data analysis approach provide a useful opportunity to extrapolate how measuring within and between cultural variation may yield insights in future acculturation studies.

1.1. Quantifying behaviors and beliefs: between and within the "group"

The quantitative measurement and analysis of a group-level mean score on a dimensional variable is well reasoned and useful, *only to the extent that it informs the inference we make about the culturally based norm for that behavior or belief.* That is, the key assumption is that the mean score is the best quantitative representation of that group's norm on that behavior or belief. For example, the widely studied dimensions of interdependence and independence (Hofstede, 2001) are often quantified, and a mean score for each cultural group is computed that can be interpreted as the "norm" for that group (but see McSweeney, 2002, for a critique of the approach). These behavior and belief norms, as computed mean scores, can then be compared between groups, and the likelihood by chance of finding a difference between the groups' norms can be estimated (i.e., *p*, the probability of falsely rejecting the null hypothesis of no mean difference between groups). Looking at it another way, for scientists who do *not* presume that the mean score on a dimension of interest represents the norm for that group, it is unclear why quantitative tests of group mean differences would be useful at all.

The challenge for quantifying norms in behavior and beliefs is developing a common approach for estimating and interpreting between-group and within-group variation. Although there is increasing emphasis throughout the social and behavioral science disciplines on reporting and interpreting all aspects of the distributions of variables being studied, there is little consideration of having a common approach to *interpreting* the within-group variance that is found. For cross-cultural studies, this remains a major gap in much of the intracultural and intercultural research being conducted (Taras, Rowney, & Steel, 2009). As Taras et al. (2009) report, in a meta-analysis of studies that had quantified cultural variables as dimensional scores (e.g., traditionalism, group loyalty, family integration), only one in 50 of the over 500 studies that were examined described and interpreted within-group (i.e., culture) variation. Over half of the studies did not even report descriptive statistics on score dispersion (i.e., variance, standard deviation) in each group.

With respect to studies of acculturation, we searched the literature for relevant studies that reported and compared within- and between-group variation, but we were not able to identify any that did so using the approach we present. It is not that acculturation researchers are unaware of within-group variation. On the contrary, many studies of acculturation acknowledge and sometimes examine within-group differences, but it is uncommon for studies to present relative estimates of within- and between-group variation. For example, studies often make note of (and even quantify differences between) identifiable sub-groups within heterogeneous groups—for example, country of origin distinctions among Asian Americans or Latino Americans (e.g., Xia, Do, & Xie, 2013). However, that kind of an approach typically does not parse within-versus between-group variance. A second way in which studies of acculturation have addressed within-group differences is by

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