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Edited by David Matsumoto and Fons J. R. van de Vijver

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Introduction to the Methodological Issues Associated With Cross-Cultural Research

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Although once considered to be at the margins of psychological science, the study of culture has blossomed into one of the most important areas of research today. Studies involving cultural variables appear more frequently than ever before in mainstream journals in developmental, clinical, personality, and social psychology, as well as in specialty journals such as the *Journal of Cross-Cultural Psychology*, *Culture and Psychology*, *International Journal of Intercultural Relations*, and the *Journal of Cross Cultural Management* (van de Vijver, 2006). Theorists are also increasingly incorporating culture as an important variable into their theories and models of psychological processes.

The methodological backbone spurring the blossoming of cultural science in psychology is cross-cultural research, in which two or more cultural groups are compared on psychological variables of interest. This is true regardless of the theoretical approach or perspective one adopts in understanding cultural influences on mind and behavior. For instance, methodological differences used to exist between those who called themselves cross-cultural psychologists versus those who called themselves cultural psychologists, with the former basing most of their work on cross-cultural comparison and the latter arguing that such comparisons were unwarranted, unjustified, and unnecessary (Greenfield, 1997; Shweder, 1999). Today, however, even those who call themselves cultural psychologists clearly use cross-cultural research methods as the method of choice in conducting research (e.g., Heine et al., 2001; Kitayama, Mesquita, & Karasawa, 2006; Markus, Uchida, Omoregie, Townsend, & Kitayama, 2006).

Indeed, there are many potentials and advantages that cross-cultural comparisons afford. They test the boundaries of knowledge and stretch the

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methodological parameters under which such knowledge is created and vetted in psychology. They highlight important similarities and differences across cultures. They bring researchers in disparate and divergent cultures together for a common cause. Their findings promote international and intercultural exchange, understanding, and cooperation. They contribute to a broader and deeper understanding of human behavior and the mind. Finally, cross-cultural theories can provide frameworks that accommodate both individual and cultural sources of variation (Berry, Poortinga, Segall, & Dasen, 2002).

However, with the potentials and advantages come some risks and liabilities, the foremost of which is the production of cultural knowledge that is incorrect because of flawed methodological procedures. Cross-cultural research brings with it a whole host of methodological issues that go much beyond monocultural studies, from issues concerning translation, measurement equivalence, sampling, data analytic techniques, and data reporting. To be sure, good cultural science is first and foremost good science, and many concepts that ensure the methodological rigor of any quality scientific enterprise is applicable to cross-cultural research as well. Thus, it is important for any cross-cultural researcher to have excellent baseline methodological skills.

Cross-cultural research also brings with it a host of issues and problems that are unique to cross-cultural studies, and it is important to be knowledgeable about and address these as well. The risk of producing cultural knowledge that is incorrect or not replicable is too great if these methodological pitfalls are not understood and addressed. Given the importance of cross-cultural research in producing a global psychology that truly has the potential for helping to create a better world, it is incumbent on cultural scientists to be fully aware of these issues and their solutions. Many of the risks associated with cross-cultural research are enhanced when it is conducted without the full awareness and sensitivity of the various issues associated specifically with it.

The purpose of this book is to introduce researchers to those risks and describe recent methodologies to minimize them, so that cross-cultural research can reach its potential.

CULTURAL DISTANCE AND RIVAL HYPOTHESES

Cross-cultural studies often involve quasi-experimental designs, in which samples are not randomly selected from a population or assigned to conditions (researchers cannot randomly assign an individual to a culture).

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This can result in the incomplete matching of samples, which has various ramifications in cross-cultural studies, but one is critical. Interpreting findings about similarities and differences is much more difficult in cross-cultural studies than in experimental studies that are based on random assignment of participants. The interpretation of cross-cultural differences is often threatened by bias and the lack of equivalence (topics that deserve their own chapter and are covered in Chapter 2 by van de Vijver and Leung), which give rise to many rival explanations for the cross-cultural differences observed. For example, do cross-cultural differences in test scores of reading reflect “real” differences in reading skill across the countries involved in a study, or do the differences reflect curriculum differences across the countries? Were the children in the cultures involved not entirely comparable in terms of relevant background characteristics such as socioeconomic status, or was the test differentially appropriate for all the countries involved?

Various procedures have been proposed to deal with rival explanations for cross-cultural findings, such as the inclusion of additional variables in a research design to confirm or disconfirm specific interpretations. An example is the “unpacking” of cross-cultural differences (see Chapter 4 by Bond and van de Vijver in this volume). The choice of variables to deal with rival explanations is mainly based on theoretical considerations; yet methodological considerations also play a role. The number of rival explanations depends on the *cultural distance* of the groups involved in a study. More dissimilar groups may show more differences in target variables, but it is also more likely that they differ in background variables. Suppose that extroversion has been measured in the United States, Canada, and Japan. Cultural differences between the American and Canadian samples will be easier to interpret than the collective North Americans’ differences from the Japanese sample. For example, differences in response styles, such as acquiescence and an extremity response pattern, are more likely to affect the comparisons between Japan and the two North American groups. Cultural distance creates a paradox in cross-cultural measurement: The larger the cross-cultural distance between groups, the more likely cross-cultural differences will be observed, but the more likely these differences may be influenced by uncontrolled variables. In other words, the easier it is to find significant cross-cultural differences, the more difficult it is to interpret them.

Cultural distance can be measured as a psychological variable by asking respondents from a country how much difference they feel toward a set of other countries; similarly, immigrants from different ethnicities can be asked how much difference they feel toward the dominant culture.

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A second prevailing view on cultural distance focuses on country-level variables such as social indicators, values, and religions. Examples have been proposed by Hofstede (2001), Schwartz (1992), Inglehart (1997), Georgas and Berry (1995), the Chinese Culture Connection (1987), and House, Hanges, Javidan, Dorfman, and Gupta (2004), to mention a few. The most frequently quoted of these models, that of Hofstede, views cross-cultural differences in work-related values as four-dimensional (power distance, masculinity, uncertainty avoidance, and individualism); long-term orientation was added in a later version. Both “subjective” and “objective” measures of cultural distance have been found to predict cross-cultural differences in psychological variables (e.g., Galchenko & van de Vijver, 2007; Hofstede, 2001). Regardless of the method of measurement, one of the basic issues researchers may become aware of is the relationship among cultural distance, the probability of generating differences, and rival hypotheses that account for such differences.

A Taxonomy of Cross-Cultural Studies

The number of rival explanations to be accounted for in cross-cultural studies also depends on the *type of research question*. Three dimensions are proposed here to classify the research questions raised in cross-cultural research (and hence, cross-cultural studies; van de Vijver, 2009). The first dimension refers to the presence or absence of *contextual factors* in a research design. Contextual factors may involve characteristics of the participants (such as socioeconomic status, education, and age) or their cultures (such as economic development and religious institutions). From a methodological perspective, contextual factors involve any variable that can explain, partly or fully, observed cross-cultural differences (Poortinga & van de Vijver, 1987). Including such factors in a study will enhance its validity and help rule out the influence of biases and inequivalence because an evaluation of their influence can help to (dis)confirm their role in accounting for the cultural differences observed. For example, administering a measure of response styles can help to evaluate the extent to which cross-cultural differences on extroversion are influenced by these styles.

The second dimension involves the distinction between *exploratory* and *hypothesis-testing* studies. Exploratory studies attempt to increase our understanding of cross-cultural differences by documenting similarities and differences. Researchers tend to stay “close to the data” in exploratory studies, whereas hypothesis-testing studies make larger inferential jumps

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by testing theories of cross-cultural similarities and differences. Unfortunately, the validity of these inferential jumps is often threatened by cross-cultural biases and inequivalence. The methodological strengths and weaknesses of exploratory and hypothesis-testing studies mirror each other. The main strength of exploratory studies is their broad scope for identifying cross-cultural similarities and differences, which is particularly important in underresearched domains of cross-cultural psychology. The main weakness of such studies is their limited capability to address the causes of the observed differences. The focused search for similarities and differences in hypothesis-testing studies leads to more substantial contributions to theory development and explicit attempts to deal with rival explanations but is less likely to discover interesting differences outside of the realm of the tested theory.

What is compared across cultures is addressed in the third dimension. A distinction is made between *structure-* and *level-oriented studies*. The former involve comparisons of constructs (e.g., is depression conceptualized in the same way across cultures?), their structures (can depression be assessed by the same constituent elements in different cultures?), or their relationships with other constructs (do depression and anxiety have the same relationship in all countries?). The latter involve the comparisons of scores (do individuals from different cultures show the same level of depression?). Structure-oriented studies focus on relationships among variables and attempt to identify similarities and differences in these relations across cultures.

Brouwers, van Hemert, Breugelmans, and van de Vijver (2004) found in a content analysis of articles published in the *Journal of Cross-Cultural Psychology* that the number of level-oriented studies is about twice the number of structure-oriented studies. From a methodological perspective, structure-oriented studies are much simpler than level-oriented studies, which are usually more open to alternative interpretations. For example, suppose that a neuroticism questionnaire has been administered in two countries and that the two countries differ in extremity scoring. If all the items are phrased in the same direction (which is often the case in personality measurement), cross-cultural differences in extremity scoring will be confounded with valid differences in neuroticism. As a consequence, cross-cultural differences in means are difficult to interpret. However, as long as extremity scoring only affects the item means and leaves item correlations and covariances unchanged, the factor structure, which is often examined in structure-oriented studies, will not be affected.

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In summary, studies with cultural groups that have a large cultural distance from each other are likely to be more threatened by biases and inequivalence. Studies that do not include contextual factors, that are designed to evaluate hypotheses and advance a theory, and that target level-oriented cultural differences are also more threatened by biases and inequivalence.

Cross-Cultural Research Designs

By far the most important part of any cross-cultural study, and in our opinion for any study in general, is knowing which research questions to ask in the first place. The purpose of conducting research is to contribute to a body of knowledge that is institutionalized in what is known as the research literature. Indeed, the research literature is any field's institutional memory of the cumulative knowledge gathered over the years, and it is to this memory and body of knowledge that any study should contribute. Thus, any consideration of research designs starts first with a comprehensive and functional knowledge of that research literature – the institutional memory – so that one understands what gaps in the knowledge exist, and thus which research questions should be addressed and how the field can be advanced. An appreciation of the knowledge gaps should be combined with adequate methodological knowledge. It is only in the combination of theory and method that real contributions can be made by exploiting the strengths of both. It happens all too often that researchers exclusively focus on substantive issues of a study, thereby neglecting bias issues or the additional power of good design and analysis. Similarly, it also happens too often that sophisticated statistical techniques and elegant research designs have to “salvage” studies that are neither novel nor insightful.

Understanding why any study is to be conducted in the first place leads to questions about how to conduct it, which is a discussion in the realm of research methodology. Questions related to the taxonomy described earlier apply here. Is the study exploratory in nature or hypothesis testing? Does it or should it include contextual variables? Is it structure oriented or level oriented? Of course, no one study can do everything, and in our opinion, it is better to do something of a limited scope very well than to try to conduct a study that addresses too much not so well.

Still, it is important for today's researchers to keep some things in mind. The field has gone much beyond the need merely to document differences between two or more cultures on any psychological variable. Indeed, because of cultural distance, it is fairly easy to document differences on something, provided the cultures being compared are disparate enough. Instead, one

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of the major challenges that faces cross-cultural researchers today concerns how to isolate the source of such differences and identify the active cultural (vs. noncultural) ingredients that produced those differences. Indeed, it is the empirical documentation of those active cultural ingredients to which cross-cultural research designs must pay close attention.

In doing so, researchers must consider a number of theoretical issues (discussed more thoroughly in Matsumoto & Yoo, 2006). For example, is the source of the differences to be explained cultural? Examining this question forces researchers to have a definition of what is culture and what is not and to find ways to measure it objectively. Some researchers, for instance, may consider values to be a part of culture, but country-level characteristics such as climate, population density, or social structure are not. Because definitions (and operationalizations) of culture (and not culture) can be as varied as the individual researchers who create or adopt such definitions, our advice is not to be overly ambitious by trying to create definitions with which everyone will agree (especially because experience shows that such definitions become broad, unwieldy, and uninformative for the aspects of culture that are relevant in any specific study) but to be more modest and practical, making one's definitions and thus operations explicit so that others know what they are.

Another issue that researchers face in identifying active cultural ingredients that produce differences concerns a level-of-analysis issue. Cultural variables exist on the group and individual levels. Furthermore, studies themselves can be entirely on the individual or cultural level, or involve a mixture of the two in varying degrees with multiple levels (see Chapter 11 by Nezlek). Different variables at different levels of analysis bring with them different theoretical and methodological implications and require different interpretations back to the research literature.

In the realm of individual-level approaches to culture, other issues that arise concern exactly what those individual-level cultural variables are, how to measure them, and how to distinguish between them and noncultural variables on the individual level. For example, what is the difference between measuring "cultural attitudes" on the individual level and personality? Certainly a variable is not "cultural" just because a researcher says it is; a well-thought-out rationale based in theory and data must support the identification and distinction of such variables.

Another theoretical question that researchers must face in designing studies concerns their theoretical model of how things work. A commonly held view is that culture "produces" differences in a fairly top-down theoretical bias held by many. How do we know this to be true, however, and

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more important, how does one demonstrate it empirically? It may very well be that individual-level psychological processes and behaviors produce culture in a bottom-up fashion, or that both top-down and bottom-up processes occur simultaneously. Regardless of how one believes things are put together, it behooves researchers to adopt research design strategies that are commensurate with their beliefs and models.

Isolating the active cultural ingredients that produce differences can lead to the use of unpackaging studies (see Chapter 4 by Bond and van de Vijver), experiments, or other methodologies. Each, of course, has its own risks and benefits. After a basic paradigm is adopted, however, researchers need to deal with the nitty-gritty of the science, including sampling, translation, measurement bias and equivalence, data analysis, and the like. These are the nuts and bolts of cultural science on which the remainder of the book focuses.

PREVIEW OF THE BOOK

After this chapter, this book is divided into two parts. Part I deals with conceptual and methodological issues that researchers should be aware of during the design phase of their studies. Part II deals with computational methods and procedures for data analysis after data have been collected. Although the topics covered are not orthogonal to each other by any means, we do have a bias ourselves, which we state explicitly here: No sophisticated or complex data analysis can ever fix a bad design or poorly collected data. Thus, although cultural scientists are often keen to learn about the latest in statistical methodologies, it behooves them to pay close attention to the conceptual issues described in Part I that aid them in designing quality studies in the first place.

Part I

It is easy to approach the study of culture with some biases, the largest of which centers around the constructs of equivalence and bias. As you can read in Chapter 2 by van de Vijver and Leung, bias refers to differences in a measurement instrument that do not have exactly the same meaning within and across cultures (Poortinga, 1989), whereas equivalence refers to the level of comparability of measurement outcomes. These constructs are crucial to good cross-cultural research and underlie almost all of the topics discussed in the remainder of this book, which is why it is the topic of the first chapter. There, van de Vijver and Leung describe several types

of bias, such as construct bias, method bias, and item bias, as well as types of equivalence, including construct inequivalence, structural or functional equivalence, metric or measurement unit equivalence, and scalar or full-score equivalence. They provide guidelines and suggestions for dealing with issues concerning equivalence and bias, both before data collection and after. And they discuss procedures by which researchers can optimize adaptations of tests and survey instruments. This important chapter, therefore, serves as a foundational basis for all of the subsequent chapters.

One of the major issues that cross-cultural researchers face concerns how to deal with language, especially in terms of the instruments and procedures of a study. Of all the methodological issues that face cultural scientists, none is more unique to cross-cultural research than the fact that cross-cultural studies often require the collection of data in two or more linguistic groups. As such, issues concerning equivalence between the languages used in the study become of paramount importance. Even if words are translated into different languages, this does not mean that the resulting translations are equivalent to the originals. In Chapter 3, Hambleton and Zenisky describe 25 criteria with which to evaluate the adequacy of translations done for cross-cultural research. The criteria span major topics such as General Translation Questions, Item Format and Appearance, Grammar and Phrasing, Passages and Other Item-Relevant Stimulus Materials, and Cultural Relevance and/or Specificity. The evaluation sheet they offer readers at the end of their chapter is an especially useful tool for researchers to use.

Cross-cultural research is largely based on quasi-experimental designs, and as such, when differences are found, it is impossible to draw conclusions about the source of those differences. Despite that, cross-cultural scientists often do draw those interpretations, with little or no empirical justification, and thereby commit an ecological fallacy (Campbell, 1961). In the realm of cultural science, when researchers attribute the source of observed differences in a quasi-experimental design to culture, this mistaken inference has been termed the *cultural attribution fallacy* (Matsumoto & Yoo, 2006). One way to address this limitation in quasi-experimental designs is to include variables in the data collection that operationalize meaningful dimensions of culture and then empirically test the degree to which those variables account for the differences. Such variables are called context variables, and quasi-experimental designs that include context variables are known as unpacking studies, which is the topic of Chapter 4 by Bond and van de Vijver.

When doing cross-cultural work, it is impossible to access only participants from the local introductory psychology participant pool. Thus,

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another way in which issues concerning equivalence and bias affect cross-cultural work is in sampling. Indeed, it is easy for samples across cultures to differ on many demographic characteristics, and these demographics often confound any observed differences. Thus, it may be difficult at times to draw conclusions based on culture versus demographics. In Chapter 5, Boehnke, Lietz, Schreier, and Wilhelm discuss issues concerning sampling on both the individual and cultural levels and provide guidelines for researchers that allow for empirically justified conclusions to be drawn while being sensitive to particular needs and issues associated with samples from different cultures.

Another way in which people of different cultures may vary is in the use of response scales. Whereas early cross-cultural research viewed different cultural biases in the use of scales as nuisance variables that needed to be controlled, theoretical and empirical perspectives today view such biases as potentially important aspects of culture and personality (Smith, 2004). Thus, in Chapter 6, Johnson, Shavitt, and Holbrook discuss these issues, paying close attention to concerns about socially desirable responding, acquiescence, and extreme responding. Like all chapters in the book, they not only describe the issues raised by these constructs but they also provide useful guidelines and suggestions for cultural scientists.

Part II

The chapters in Part II deal with issues concerning data analysis and interpretation. Chapter 7, by Fischer and Fontaine, deals with methods for investigating and establishing structural equivalence. As introduced in Chapter 2, structural equivalence is an important aspect of measurement procedures in cross-cultural research, and Fischer and Fontaine discuss four techniques for testing it – multidimensional scaling, principal component analysis, exploratory factor analysis, and confirmatory factor analysis. For each, they describe a step-by-step approach to the analysis, alternative procedures, and its strengths and weaknesses.

Whereas Chapter 7 deals with structure-oriented techniques, Chapter 8 by Sireci describes level-oriented statistical techniques to analyze the functioning, efficiency, and equivalence of items. He differentiates between item bias, item impact, and differential item functioning (DIF) and describes five methods for evaluating DIF – delta plot, standardization, Mantel–Haenszel, item response theory (IRT) likelihood ratio, and logistic regression. As Sireci explains, these five methods provide a wide variety of options for evaluating DIF, and the choice of method will depend on several factors including