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Barry Thatcher
New Mexico State University

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Fotonovelas and Anglo designs in health communications for Spanish-speaking residents along the U.S.-Mexico border

Barry Thatcher

New Mexico State University, USA

Abstract

This study compares the intercultural instructional designs, based on eight intercultural value sets, of two types of health communications for Spanish-speaking U.S.-Mexico border populations. The first design is the *fotonovela*, or photo drama pamphlet, an approach that is well developed in Latin America and modeled after the famous Latin American television soap opera genre of *telenovelas*. This design dramatizes health information in culturally appropriate ways. The second design is Anglo dominant, representing predominant rhetorical and cultural preferences of the United States. Grounded in a Texas Health Equity project, the research team created a fotonovela for septic maintenance for border *colonias*. The team then compared the preference and effectiveness of the fotonovela to an existing EPA manual that reflected the Anglo dominant design, asking Spanish-speaking residents on the U.S. side of the U.S.-Mexico border their preferences for instructional designs. The results showed a very strong correlation between the fotonovela/Anglo designs and birthplace, language proficiency, and education. These results suggest that professional communicators need to move beyond demographics in designing their health communications for Spanish-speaking audiences. Instead, the study proposes a typology of five Hispanic/Latino identities for the U.S.-Mexico border, which helps professional communicators better assess rhetoric preferences and traditions.

Introduction and problem statement

Now, it is widely recognized that medicine, health care, and health communications are not universal but are intimately connected to local cultures and medical traditions (Purnell, 2009). Consequently, health and medical services are best delivered using the cultural and communication patterns of the patients (see, for example, Purnell, 2009; Tseng & Streltzer, 2008). This move towards *culturally competent health care* is so critical to reducing health disparities in the United States that it is mandated at the federal and many state levels (hrsa.gov/culturalcompetence). Not surprisingly, much research has focused on improving

health disparities using culturally competent health care. This is especially true with *Latinos* or *Hispanics* (hablamosjuntos.org), which make up the largest U.S. minority. For example, new critical research has focused on the roles of Spanish translators and new multimedia forms to bridge cultural and linguistic differences for Hispanic populations (Angelelli & Jacobson, 2009).

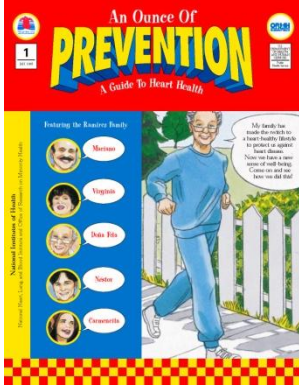

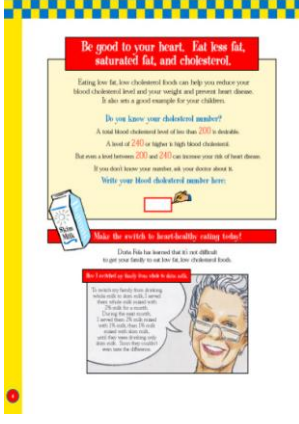

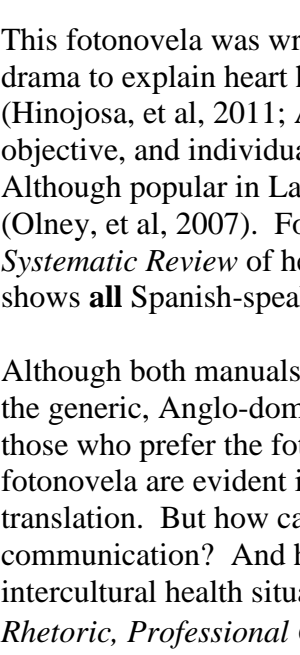
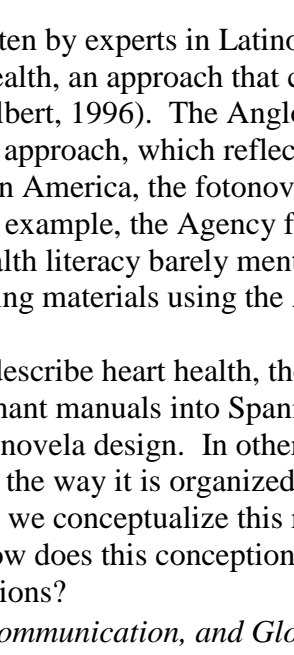
A critical component of culturally competent health care is using culturally sensitive communications (hrsa.gov/culturalcompetence) to deliver that health care. This simply means matching the purpose, format, information needs, and style of the communication to the communicative expectations of the target audience. For example, Givaudan et al. (2005) have developed specific strategies for delivering culturally sensitive communications for Hispanic audiences. These include understand the cultural forms of Latino communications; developing texts and formats that match these forms; using appropriate language and vocabulary; understanding the issues of health care most relevant to Latinos; and the critical variables for promoting health behavior. Much of the effort in developing these culturally sensitive materials focuses on the inadequacy of traditional methods of assessing health communications, especially those involving readability formulas (Contreras, 1999—cited in Givaudan). In other words, just like health care services, the readability or effectiveness of health communications has to be examined in light of the cultural expectations of the audience.

Concurrent with this work in culturally competent health care is the significant focus on health literacy, which is generally defined as understanding, accessing, and appropriately using health related tools and services. The field of health literacy is very broad (Shohet, 2004), encompassing many approaches, theories, methods, and practices. Much has been written and researched about health literacy, including, for example, the special edition of health literacy in the *Journal of Health Communications*. Further, the Agency for Healthcare Research and Quality just published an extensive review of health literacy research, summarizing the results of over 139 studies. Many researchers argue that health literacy patterns and practices are culturally dependent and thus vary, often significantly, across cultures (Singleton & Krause, 2009; Purnell & Paulanka, 2008). The question remains, however: how does health literacy vary across cultures and why?

Despite the efforts to address health literacy in intercultural contexts (Olney, et al, 2007; hablamosjuntos.org), there is still a large gap in theory, methods, and practice, most of which is due to the inability of researchers to see the connection between rhetorical and cultural patterns. To exemplify this gap, I present in Table 1, two forms of health literacy that are common on the U.S.-Mexico border: the one on the left is a fotonovela, while on the right is what I have defined as an Anglo-dominant approach.

Table 1

Two manual designs for cholesterol and cardiovascular health

Fotonovela Literacy Patterns <i>An Ounce of Prevention: A Guide to Heart Health</i> (NIH, National Heart and Blood Institute; 4 of 24 p.)	U.S.-Generic, Anglo Literacy Patterns <i>High Blood Cholesterol: What you Need to Know</i> (NIH, National Heart and Blood Institute; 4 of 6 p.)
	
	
	

This fotonovela was written by experts in Latino health. It uses a family situation, games, and drama to explain heart health, an approach that corresponds well to Latino cultural values (Hinojosa, et al, 2011; Albert, 1996). The Anglo or generic design assumes an analytical, objective, and individual approach, which reflects broad U.S. cultural values (Thatcher, 2012). Although popular in Latin America, the fotonovela design is rare in U.S. health care materials (Olney, et al, 2007). For example, the Agency for Health Research and Quality’s 2011 *Systematic Review* of health literacy barely mentions fotonovelas and its consumer website shows **all** Spanish-speaking materials using the Anglo design (ahrq.gov/consumer/).

Although both manuals describe heart health, the stark differences show that simply translating the generic, Anglo-dominant manuals into Spanish will not meet the cultural expectations of those who prefer the fotonovela design. In other words, the cultural characteristics of the fotonovela are evident in the way it is organized and presented; culture is much deeper than translation. But how can we conceptualize this relationship between culture and communication? And how does this conception help us understand and design materials for intercultural health situations?

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The problem is that current approaches in health literacy and cultural competency cannot assess much beyond translation and language proficiency. First, since *culture* is often defined and operationalized so broadly, valid and reliable research and practice are difficult. For example, the U.S. Office of Minority Health defines culture as “the thoughts, communications, actions, customs, beliefs, values, and institutions of racial, ethnic, religious, or social groups” (minorityhealth.hhs.gov). This catch-all approach has such a great variety of multiple and complexly related variables, units of analysis, and potential interactions that developing and assessing *relevant* intercultural differences are difficult, if not impossible (Lucy, 1996; Bhawuk & Triandis, 1996; House, et al., 2005; Hofstede, 2010; Thatcher, 2012). Instead, researchers need to create a universal frame of relevant and measurable variables that both cultures share and then embed cultural differences in the shared frame, much as described later in the onion model.

In addition to relevancy and broadness, this catch-all definition is often saddled to a narrow view of communication that is based on translation clarity and language proficiency. Defined as the “window-pane” theory of communication (Miller, 1979), this view assumes that if the words or translation are polished well, the audience will understand. For example, most Spanish health literacy assessment tools are word-based, such as the REALM-SF and SAHLSA-50 (ahrq.gov/populations/sahlsatool.htm). When this narrow view of communication is connected to a catch-all definition of culture, researchers cannot assess how cultural differences are connected to literacy patterns in everyday sense-making activities (Barton, 2005; Bourdieu, 1999; Bakhtin, 1990). In short, this approach cannot assess why the Fotonovela and Anglo-dominant designs are so different and what those differences mean across groups of people.

Third, because the gap between the catch-all definition of culture and narrow view of communication is difficult to reconcile, most health care stakeholders are forced to rely on demographic data to assess their intercultural communications needs. However, demographics such as race and ethnicity do not reliably indicate cultural behavior (Hofstede, 2010; House, et al, 2005), especially on the U.S.-Mexico border (Thatcher, 2012). For example, although the 2010 census shows a significant *Hispanic* population on the border, there is not a comparable monolithic pattern in literacy expectations. In the following Table 2, Thatcher (forthcoming) defines five complexly related *Latino/Hispanic* groups on the U.S.-Mexico border:

Table 2
Five transient points of stabilized identity along the U.S.-Mexico border.

Transient Points of Stabilized Identities	Relation to dominant Mexican rhetorical patterns (including Spanish)	Relation to U.S. cultural and rhetorical patterns (including English)	Strategic positioning among points of identity in structured contexts.	Acculturation issues for U.S.- and English-sourced health communications
1. Mexican-American (3 rd + generation U.S.-American with Mexican ancestry)	<ul style="list-style-type: none"> Remnants of Spanish and Mexican culture especially in family contexts. Limited function in—and ambivalence towards— Mexico. 	Significant and often overt assimilation of deeply-rooted U.S. cultural values.	Can position as Mexican identities with Anglos, but readily identifies with U.S and distances from Mexico, recent immigrant, or G1.5 identities.	<ul style="list-style-type: none"> English dominant. Some affinity for select cultural and rhetorical traditions from Mexico but within a U.S. frame.
2. Recent Immigrant (less than 10 years in the U.S. and from Mexico or Latin America)	Deeply connected to Spanish and Mexican cultural and rhetorical patterns, but mostly oral traditions and limited formal education.	Ambivalent and contextual: learn U.S. patterns sufficiently to function in employment and education but reject or ignore other U.S. values.	Can identify and position as recent immigrant, Mexican national or perhaps Mexican-American but little capacity with U.S. traditions.	<ul style="list-style-type: none"> Often limited educational, English, and literacy traditions. Strong oral and interpersonal traditions grounded in Mexican rhetorical patterns.
3. Generation 1.5 (U.S.-born but from Mexican or Latin American parents).	<ul style="list-style-type: none"> Inherit Mexican culture from parents and U.S. culture in education and work. Family Spanish. Oral traditions, especially as children; written traditions at school and in English. 	<ul style="list-style-type: none"> Academic and economic success are connected to English and U.S. traditions. Strong affinities for U.S. cultural values of universalism (level playing field) and individualism (relative independence), 	<ul style="list-style-type: none"> Can move between professional contexts with English and family contexts with Spanish. Difficulty functioning as Mexican national but possible as recent immigrant and usually functioning as U.S.- or Mexican-American. 	<ul style="list-style-type: none"> The most complex group/sets of issues. Spanish/Mexican repertoire in certain rhetorical situations and English/U.S. in others. Great identity complexities and ambivalences.
4. Mexican National (born and educated with significant ties to Mexico).	<ul style="list-style-type: none"> Strongly connects Mexican rhetorical and cultural traditions. Ambivalence to U.S. dominance, especially historically. 	<ul style="list-style-type: none"> Often in U.S. to improve economic and academic capacities. Ambivalence about U.S. cultural and rhetorical traditions. Academic English with limited practice. 	<ul style="list-style-type: none"> Often not reliably informed about other points of border identity but can pass as recent immigrant. Can view other identities as sellouts or culturally suspect. 	<ul style="list-style-type: none"> Strong educational backgrounds. Most issues are linguistic (Spanish→English) and contrastive rhetoric.
5. Cross-border & bicultural: Live and work on both sides border, bilingual.	<ul style="list-style-type: none"> See strengths and weaknesses in both U.S. and Mexican cultural and rhetorical traditions→capacity to leverage strengths and minimize weaknesses according to situation. Feel both marginalized and empowered at the same time, rooted but rootless. Most often hide bicultural and bilingual traits, as compared to other groups. 		<ul style="list-style-type: none"> Adept at positioning themselves as Mexicans, Mexican-Americans, or U.S.-Americans depending on power dynamics. Ambivalence towards Anglo-Americans. 	<ul style="list-style-type: none"> Strong general rhetorical skills because of innate systematic nature of their bicultural and bilingual orientation. Can mix-up which rhetorical strategies are appropriate in given contexts.

This article does not have the space to fully explore the definitions and expressions of these identities, which is explored elsewhere (Thatcher, forthcoming), but generally following Vila

(2003), it explores the complexly structured and strategically changing border identities for the five groups most likely classified as Hispanic/Latino by demographics.

This table explains much better than demographics why professional communicators cannot assume that the five *Latino* groups would prefer the fotonovela as compared to the Anglo design. Although designed for Latinos, the fotonovela fits better recent immigrants who generally bring oral traditions and Mexican rhetorical expectations to rhetorical situations; the other four Latino groups have ambivalent and complicated connections to the fotonovela and the Anglo pamphlet. For example, Mexican-Americans most likely favor the Anglo version, while highly literate Mexican nationals could be offended by the comic-book nature of the fotonovela but might not connect well to the detached objectivity of the Anglo version. Generation 1.5 would be mixed based on their hybrid literacies, and the cross-border group would most likely favor one design over the other based on the rhetorical situation. However, because the very predominant approach to health communications in the United States is to lump all five groups into one, we simply do not know the connection between rhetorical expectations and instructional designs.

For effective intercultural health literacy, we need methods that assess and then match the cultural orientations of people and literacy designs. Unfortunately, we cannot draw on the 14 CLAS Standards (Culturally and Linguistically Appropriate Services), which the U.S. Office of Minority Health have developed for ensuring culturally appropriate health care services (minorityhealth.hhs.gov/templates/browse.aspx?lvl=2&lvlID=15). These standards are based on the catch-all view of culture, window-pane theory of communication, and demographics. Further, it is apparent that large, national health care agencies, providers, and technology companies continually develop Spanish materials for the Hispanic audience that use Anglo-dominant designs (Thatcher, 2012; hablamosjuntos.org). Further, fotonovelas are usually developed locally in specific contexts, minimally using existing materials and evidence-based approaches. We simply don't know of their effectiveness.

Drawing on intercultural research in communications (Samovar, Porter & McDaniel, 2009), organizational behavior (Hofstede, 2010; House, et. al., 2005), and rhetoric and professional communication (Varner & Beamer, 2011; Thatcher, 2012;), this project develops a carefully articulated model of culture and literacy that assesses relevant and measurable variables for connecting culture to health literacy for Spanish-speaking residents along the U.S.-Mexico border.

Theoretical and methodological approaches

As first developed by literacy scholars (Berlin, 1987; Pappen, 2009), but refined for intercultural contexts (Thatcher, 1999, 2012) using intercultural models (Hofstede, 2010; Hampden-Turner, 2000; House et al., 2005), the intercultural literacy model is a universal framework of relevant variables that embeds cultural differences and similarities within that frame. First, the model shows literacy and culture in a four-part layered relationship. As shown below in Figure 2 on the left, the center of the model is the conception that a culture develops of the self or human being. This conception of the self, in turn, constructs or reinforces distinct thinking or cognitive patterns, and these cognitive patterns construct appropriate social behavior. All three categories

correspond to distinct literacy patterns. And finally, the literacy patterns simultaneously reinforce or re-create the previous three categories, as shown by the arrows.

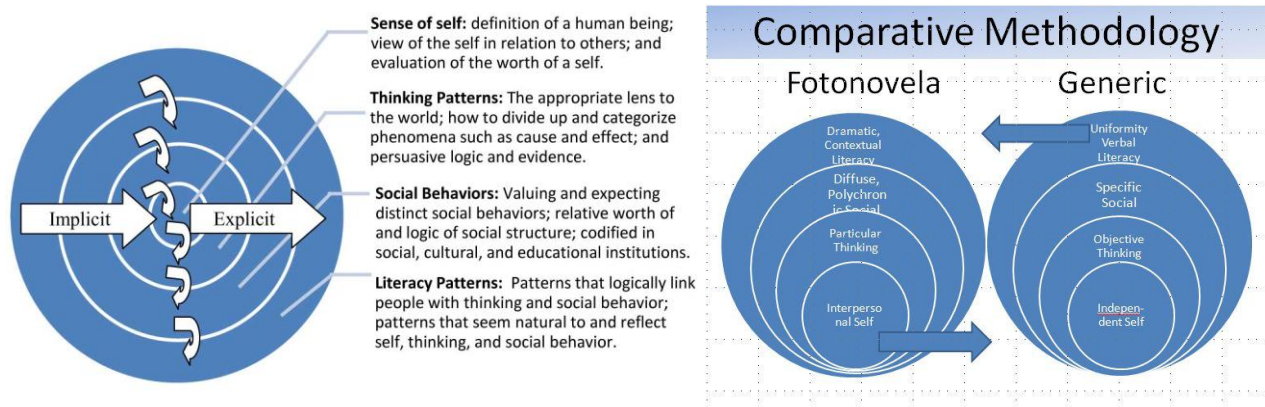


Figure 2. Culture and literacy model in a comparative frame (Thatcher, 2012).

In this *onion* model, the inner layers are also implicit or unseen, while the outer layers are explicit, but the logic of the outer layers exhibit the deep logic of the inner layers and vice versa. In this universal frame, cultures can then be compared across the four layers as shown in the comparison of the fotonovela and Anglo-generic pamphlet on the right side (Thatcher, 2012).

For intercultural rhetoric researchers, this connection among the four layers is important because we can observe the social behaviors and the rhetorical patterns, and from most patterns, we can infer the epistemologies and definitions of the self. Consequently, we can infer the implicit inside layers from the explicit outside layers of social behaviors and rhetorical patterns. For example, we can understand the conception of the self or epistemology based on the observable social or rhetorical behaviors. This inference, connecting the explicit to the implicit values, is critical in developing intercultural competence. However, the rhetorical patterns are much like genres—oversimplified patterns that belie the complexity of the cultures that create them. Thus, we must not equate the generalized patterns with the behavior of the culture that is responsible for those patterns, a deductive stereotype (Bennett, 1998).

Further, this model is particularly effective for intercultural rhetoric because it shows how tacit or unconscious values systems are related, and how and why they surface in communication patterns. This is what many intercultural scholars have labeled as the iceberg theory (Hoft, 1995): Only 10% of an iceberg shows above the water, with the remaining 90% below the surface. Likewise, the communication patterns are usually the only tangible manifestation of deeply rooted, yet hidden conceptions of the self, thinking patterns, and social behavior, and thus, a miscommunication is not simply an improper transfer of information. A miscommunication implies a deviation from the target audience's conception of humanity, of thinking, and of appropriate social behavior. For example, as I have often experienced in Latin America (Thatcher, 1999), a person coming from an individualistic culture (such as the United States) will most likely draw upon direct, more objective and analytical, and openly agonistic communication patterns, which are not only misunderstood by those from more collective

cultures, but are deeply offensive because they contradict the interdependent and collective self, thinking patterns, and social relations. Thus, a miscommunication can strike a discordant chord at the very essence of the cultural values of the target audience.

This model of culture and rhetoric is useful for health literacy researchers because it demonstrates how to compare two rhetorics from different cultures. Essentially, researchers compare how different definitions of the self, thinking patterns, and social behaviors create specific forms of communication, and as a result, researchers can match the communication forms to these specific patterns. Much intercultural research has documented different conceptions of the self, thinking patterns, and social behaviors, which is summarized below in the discussion of eight intercultural value sets. This value-set comparison places the cultures on as equal standing as possible (see Thatcher, 2001; 2006; 2012) where researchers start by recognizing similarities based on shared contexts and then by considering differences within the framework of these similarities (Bhawuk & Triandis, 1996; Lucy, 1996). Embedding of difference in a framework of similarities, because it works against analyzing a second culture using the cultural constructs of the first culture, such as seeing an apple only in light of the orange (Bhawuk & Triandis, 1996).

As another key strength, this model allows researchers to draw on existing methodologies, variables, units of analysis, and cultural data developed by cross-cultural researchers (House, et al., 2005; Hofstede, 2010; Hampden-Turner & Trompenaars, 2000; Triandis, 1995; Hall, 1983, 1976). As shown in Table 3, each layer of culture corresponds to two variables/units of analysis:

Table 3
Variables and units of analysis integrated into literacy-culture model.

	Variables	What Variables Measure/Units of Analysis
Sense of Self	Individual-Collective	Levels of independence or interdependence among groups of people.
	Status/Achievement	Sources of status, pertaining to actions versus backgrounds.
Thinking Patterns	Rules Orientation	How rules are developed in universal versus particular application.
	Public-Private sphere	Crossing from public to private based on relations and context.
Social Behaviors	Inner Outer directed	Where people look for virtue and guidance for their behavior.
	Poly or Mono Time	Affinity for simultaneous or linear time.
Literacy Patterns	Context in Communication	Relevance and influence of context in communication.
	Power Distance	Influence of inequality in interpersonal communications.

Intercultural communication and organizational behavioral researchers have been using these value sets for more than 30 years, while health researchers are just beginning to notice their usefulness (Meeuwesen, et al., 2009).

Using these variables, we can now clearly assess the cultural differences between the fotonovela and the generic pamphlet. As explained fully elsewhere (Thatcher, 2012), the fotonovela and pamphlet exhibit clear cultural and rhetorical differences.

Individual/Collective

First, the two pamphlets assume differences between the individual and collective orientations. In the fotonovela, that there is a strong collective orientation, which meets the predominant values of most Latin American countries, including Mexico. The entire health scenario is grounded in the Ramirez family, including the specific roles of grandmother, father, mother, and the two children. The first page of this pamphlet does not define cardiovascular health; rather the first page lays out the family as the context for this discussion. And members of this family are not seen as independent equals, a characteristic of individualistic cultures; rather each member of the family is seen in a specific, traditional role with their corresponding hierarchies, further reinforcing the collective orientation of the pamphlet.

On the other hand, the generic pamphlet shows strong patterns of individualism. The first page of the pamphlet shows a lone individual isolated from social context. There is no grounding in a specific time, place, context or social relations; rather, there is a strong emphasis of an objective analysis of cholesterol levels, divorcing these levels from anything other than the individual uniqueness. In addition, the figure of the lone person running in light of the heart and the checklist emphasize personal achievement and self-creation. There is a friendlier document design pattern, which allows individuals to quickly locate desired information. On the other hand, the document design of the fotonovela is not as reader friendly, from U.S. cultural standpoint, because it is designed around the social interaction, not the information that needs to be presented to the user.

Rules orientation

Both pamphlets exhibit universal and particular traits, but in each one, one value orientation greatly predominates. In the fotonovela, particularist communications predominate. First, there is uniqueness in the page design, for each page has a different layout based on the particular visual and verbal information needs. Second, there is no parallel information or lists. Third, and most importantly, the rules or subject of cardiovascular health are discussed in light of the specific relations and context of the Ramirez family. And the rules change according to the circumstances because the arrival of the boyfriend raises the blood pressure of the father, a classic particularist approach to rules. Thus, the fotonovela argues for improving the cardiovascular health for the benefit of the whole family.

The generic pamphlet demonstrates strong universalist tendencies. First, it focuses on defining cholesterol levels for everyone, notwithstanding their social or personal situations. In addition, this pamphlet presents objective information, which emphasizes the scientific and universal nature of health and cholesterol. Third, this pamphlet presents much of the information in the form of lists, a universalist strategy that emphasizes the parallelism and readability needed for universalist readers. And there is a general layout that carries throughout the whole pamphlet. Fourth, this pamphlet has much more muted or less dynamic colors. Finally, this pamphlet presents the process of determining appropriate cholesterol levels very differently than the fotonovela. In this manual, the process is overt, shown by the calculator and the tables used to

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calculate the different levels of cholesterol. This overt process further reinforces the universal approach.

Sources of virtue and guidance

The logic of the fotonovela is outer-directed (Hampden-Turner & Trompenaars, 2000) because its reason or logic for controlling cholesterol and improving heart health is not analytical or vertical, universally breaking down the parts into its whole. Rather it is what Stewart and Bennett (1991) label as horizontal and relational, focusing on the context or the *what* and its relations rather than the *why*. This outer-directed approach connects the health of each of the family members together in their home with the father as the head. These horizontal connections have less to do with the actual cholesterol levels of each of the persons and more to do with the combination of what they eat and how they relate to each other in this specific context. From this perspective, one looks to harmonize himself or herself with the world. This harmonizing logic is very powerful and often uses analogies and metaphors of the natural world as logical patterns to replicate.

On the other hand, the logic and inner directed culture focuses on the vertical *why*, which is often analytical and universal which is strongly reflected in the second pamphlet. This pamphlet emphasizes the analytical and cause and effect connections between cholesterol level and health. Because bad health is connected to high cholesterol, if a person eats foods lowering cholesterol and then measures his or her cholesterol, that person can control his cholesterol, which in the end will improve his or her health. This rational and universal approach assumes a person who has an inner will or conscience that can control what enters his or her body so as to improve health of the body. This reflects the analogy of deep or vertical thinking, which is an important characteristic of inner direction (Stewart & Bennett, 1991).

Public/private and degree of involvement

The two pamphlets reflect these differences in specific and diffuse communications (Thatcher, 2012). As exemplified in the fotonovela, diffuse communication patterns demonstrate that any topic of discussion must situate the whole person in all his or her aspects and dimensions, including social hierarchies and context. Thus, the first thing that is introduced in this fotonovela is not a definition of good cardiovascular health; rather the first thing that is discussed is the family and their names and their roles. Consequently, the health of the family is holistically grounded in their relations, their diet, and their home. This multidimensional, but indirect, approach shows that persuasion does not require salesmanship, but rather a long-term establishment of interconnected, interpersonal values. Thus, as shown in this pamphlet, the diffuse patterns about cardiovascular health seem (to specific people) to be hidden in the drama of the family, circling around the point of cholesterol, because diffuse communicators need to understand the whole person before getting to the point.

On the other hand, health for the generic pamphlet is broken up into very specific topics and people, such as doctors, prescription drugs, age, gender, and other concrete components of the person, but never are these concrete or specific topics or issues brought together into a whole; rather they are discussed individually. In addition, instead of showing a concrete person or family with names and the context, the second pamphlet shows an icon of a person. Thus, this is

not a person they are talking about, but this is a part of a person that is seen only in its relation to cardiovascular health, a perhaps extreme example of a specific communication strategy. The generic pamphlet also gets at the topic very quickly, with a bulleted introduction as a caption in the left hand corner and then announcing the topic directly in the first line.

Status

The fotonovela emphasizes ascriptive variables on the first page, listing the people in the Ramirez family according to their ascriptive hierarchy. The father is first, then mother, grandmother, and children. In addition, the development of health is not carried out through an objective doctor and overt processes; rather the development of health is carried out through the ascriptive roles and familial processes of the father, the mother, a grandmother, and the children. Each one has a role in this process. Thus, the familial roles and processes handle the health issue. This is very similar to the family-run business, which is very common in ascriptive cultures because it takes ascriptive power to get things done. On the other hand, the generic pamphlet carries out the development of health through quantifiable data and overt medical processes, emphasizing tangible markers or milestones of good health. From this perspective, developing good health is like running a business based on equal opportunity employment guidelines; that is, the roles and processes are based on verifiable, visible, and rationalized roles and processes that do not depend on ascriptive (illegal) variables.

Context

These two pamphlets exemplify low and high context communication (Hall, 1976) strategies. For example, the generic pamphlet is dumbed-down to the point that almost any reader could understand it based on how concretely it codes the message into the language itself. Thus, there is little or no reliance on the context to understand what this message means in the lives of the readers. Secondly, there are many visual and verbal strategies that serve as signposts to guide the reader through the text. These include lists, boxes, small graphics and icons, lines across the page, and other ways to carefully guide how the reader processes the information. In addition, there is very specific text that can be used to accurately quantify levels of cholesterol risk, an approach that is highlighted by using the calculator icon. There is also attention to detail, including the different types of cholesterol, the different risk rates, and other concrete, and decontextual information. There are also many lists and much parallelism.

On the other hand, the fotonovela is classically high context. It communicates the message of improving cardiovascular health through the context, not through the actual codified text. Thus, the reader is supposed to infer the message of improving cardiovascular health through the family's discussion of the topic. Great attention is given to the intentions of the people, specifically the mother in wanting what is best for her family, the father in wanting what is best for him as the father in the family, the grandmother in her role, and the children in their roles. These intentions are highlighted by the perpetual smiles on the characters' faces and the positive language of the captions. In addition, the general outline or organizational patterns of the pamphlet is not topic based, but rather contextual or narrative, using the story to signpost the major sections of the pamphlet. In addition to these organizing strategies, much more detail is given to the context of where this happens, such as the house, the actual food being prepared, the details of the names of the people, and the events surrounding the topic. There is much less

technical detail in the fotonovela because these details, in the appropriate context, will be worked out.

Monochronic and polychronic time

The two pamphlets exemplify the differences in monochronic and polychronic time frames (Hall, 1983). Because the fotonovela uses the narrative or story to make its point, it manages to 1) tell the story while at the same time 2) describing high cholesterol, 3) the dietetic connection to high cholesterol, 4) the role of stress and high cholesterol, 5) the connections between age and gender for high cholesterol, and 6) how to reduce high cholesterol to improve health. This is a complex, polychronic orchestration of health, cholesterol, and the Ramirez family. In addition, as explained in the Rules Orientation section, the layout of the fotonovela is particular in that each page has its own page design showing the captions, which reflects the multitasking or simultaneity of the Ramirez family, further emphasizing the polychronic or simultaneity of the pamphlet.

The generic pamphlet is much more linear. It has a listed introduction on the first page, and this introduction lays out the exact order of the pamphlet's organization. There are clear distinctions between each section, often highlighted by different colors or a line across the page. There are caption boxes to explain different sections, thus highlighting the different time frames. Each unit of information and is clearly differentiated either visually or verbally. And, as explained in the discussion of logos, the second pamphlet highlights the linear cause and effect of cholesterol intake relating to cholesterol indices, both of which directly lead to health indicators.

Power distance

The power distance (Hofstede, 2010) is evident in both pamphlets, but perhaps in a more implicit or underlying way. First, the fotonovela clearly shows the power channels of communication. The grandmother, affectionately called Doña Fela, is the matriarch and an important leader of the Ramirez family. *Doña* is an honorific or dignified title, with no English equivalent, but it roughly means a dignified madam. As the mother of the father in the family, Doña Fela has strong authority in this family, especially over her son, the next in line in authority for the family context, although her authority is masked by the motherly or Virgin-Mary like strategies that are so common in Mexican households. These strategies include self effacement but also great care for the general welfare of others. Mariano, the father is the benevolent leader, and his wife, Virginia, speak to her in loving but very respectful and careful ways. The children are careful never to disrespect their parents or their grandmother. Thus, the lines of authority in the communication are not broken. There is no authoritarianism in the fotonovela, which can happen in less benevolent social situations.

The second pamphlet shows no authority among people. Rather it explains the information to readers who seem like intelligent, but uninformed equals in terms of authority. This low power distance approach is carried out through the other intercultural strategies such as low context communication, universalism, and achievement orientation. In addition, these four cultural values—low context, universalism, achievement, and low power distance—help the second pamphlet achieve this strategy of a user manual, one that gives the readers independence for themselves in understanding their specific heart help situation and empowering them to make

their calculations of their health risk and corresponding corrective behavior that the readers can carry out independent of the manual itself. This independence is not evident in the fotonovela and demonstrates the strong connection between manuals and the four corresponding value sets. Thus, it is not surprising that instructional manuals originated—and are very common—in cultures that are low context, universalist, achievement oriented and low power distance. In short, these two pamphlets exemplify how culture and communication patterns are related. And thus, they provide a guide for designing health materials based on the cultural characteristics of the target audience. But how well does this process work? Can we anticipate the cultural expectations of a target audience based on our best assessment of that audience's cultural characteristics? This study seeks to test this model on a project of health literacy carried out on the U.S.-Mexico border. This project developed a fotonovela for maintaining septic systems as a way to improve health and well being of Spanish-speaking residents on the border. The project team compared the fotonovela to a generic, Anglo-dominant design developed by the EPA.

Project work plan

The project team researched, developed, and carried out environmental health literacy projects relating to septic system use and water sanitation in two west Texas colonias. It was sponsored by a grant from the [Texas Center for Elimination of Disproportionality and Disparities](#). This section describes the development of the training, its community-based research approaches, and its evaluation. The last section discusses the research results, including implications for border health literacy research and practice.

Project deliverables: Fotonovelas, teatro, and community engagement

The project team developed culturally and linguistically sensitive training materials (in Spanish) for use and maintenance of septic systems and water sanitation for colonias in West El Paso County and in Ft. Hancock (Hudspeth County). These materials served as a starting point or pilot program for use in other colonias (see final version of fotonovela in Appendix A). The materials were developed in conjunction with community leaders and distributed to colonias residents and to local county and state authorities who oversee sewer/water issues in the colonias.

This training used a family approach with a grandmother caring for her grandchildren while the mothers and fathers were working, a theme strongly suggested as common and important by the community leaders in Fort Hancock and West El Paso.

The first part of the project was to develop fotonovela like the heart health one described earlier in this article. This fotonovela became the basis for the development of a community presentation and question and answer session, another important mechanism for disseminating health and environmental information for US-Mexico border communities. Using community-based approaches, the team produced 500 Spanish booklets for sewer and water sanitation. During the community presentation, the project team trained specific community leaders in inspecting the septic systems. This training helped solidify the capacity and knowledge of the community leaders.

Training sites and populations in border colonias

The U.S.-Mexico border region is home to around 2,000 *colonias*, which are low income, unincorporated rural subdivisions characterized by substandard housing, inadequate plumbing and sewage systems, and limited access to clean water. Although colonias are found in all U.S. border states, most them are located in this El Paso del Norte area and along the Big Bend area in southeast Texas.

A typical colonia is a 2 acre parcel of land with 8-12 hand-made cinder block houses or mobile homes or a 1/3 acre lot with three or four homes. There is no systematic planning for water and sewer, and many do not have potable water or sufficient land per septic system to ensure adequate septic functioning. Some homes share the same septic system or have open cesspools. The Border Environmental Cooperation Commission estimates that 150,000 households in colonias are still lacking basic sewer and water infrastructure

([www.cocef.org/files/Analisis_Final/White Paper Analysis of US-MEX Border Program.pdf](http://www.cocef.org/files/Analisis_Final/White_Paper_Analysis_of_US-MEX_Border_Program.pdf)).

In addition, most colonias have unsafe home construction, are often in floodplain locations, have poor educational opportunities, limited social networks, and no electricity or paved roads.

Most research finds that virtually all colonias residents are *Hispanic* with an average annual income of less \$5,000. Many have a large contingency of immigrant and migrant workers, along with their families, which are predominately monolingual in the Spanish language.

The research and development of the fotonovela took place in Fort Hancock, while the community training took place in East El Paso County. As shown below in Figure 3, the colonias in El Paso County are concentrated in the southeast and northeast. The community meeting took place in the cluster signaled by the red box where there are around forty other colonias representing around 700 occupied lots and perhaps more than 1400 households and 3,000 residents. (www.epcounty.com/planninganddevelopment/images/water2-unserved.pdf).

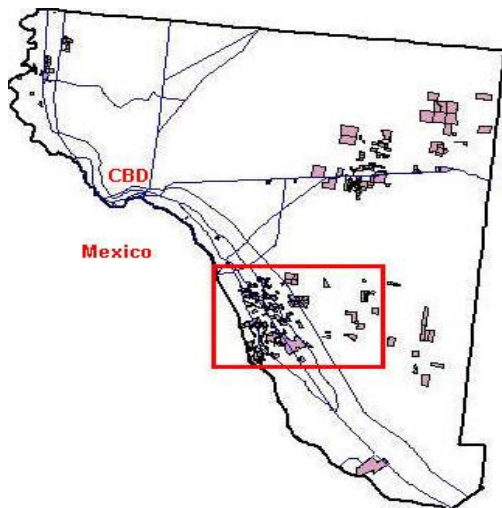


Figure 3. Map of Colonias in El Paso County (source: www.hud.gov/local/tx/groups/coloniasaz.cfm)

In Fort Hancock, the training took place is what is informally known as Fort Hancock East or Colonia Esperanza. The following Figure 4, taken from Google Earth, shows the small area of Fort Hancock on the left or west side, and the area in the rectangle is Colonia Esperanza.

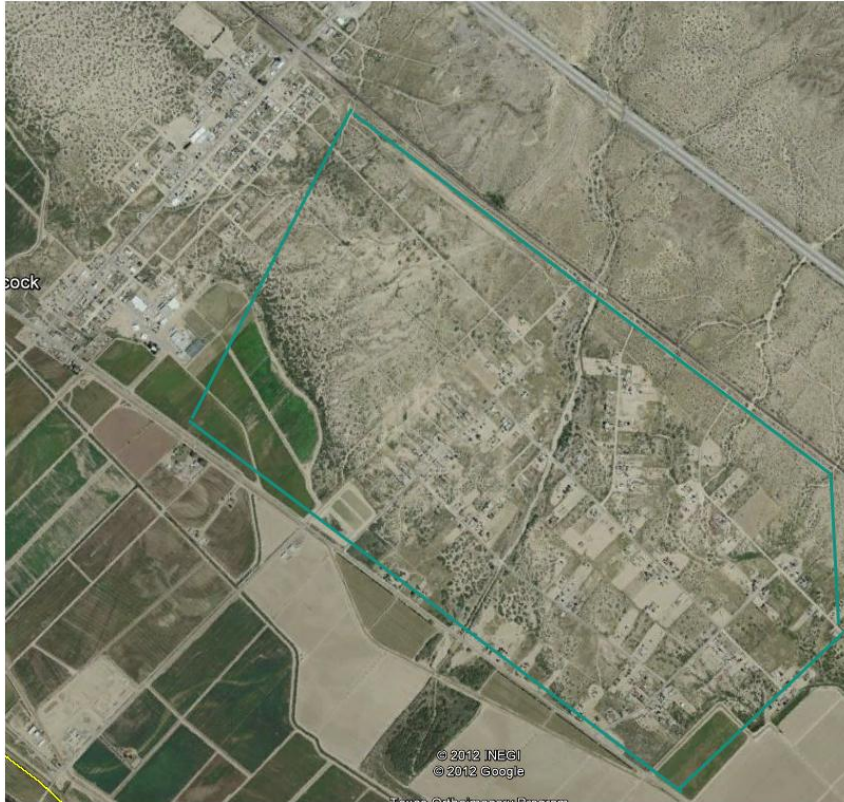


Figure 4. Colonia Esperanza.

The following is a selection of pictures in Colonia Esperanza, which generally indicate typical colonia characteristics in West Texas. Photographs were taken by Kallie Malcom, an MA photography student from NMSU who accompanied members of the project team on the research trips as a way to document the colonia.





Research and development activities

Planning initial needs assessment

The project team originally planned to carry out the work in two colonias: Colonia Revolución in East El Paso County and Villa Alegre, which is part of Fort Hancock. The team contracted a local health promoter, Enrique Cervantes (pseudonym) who lives in East El Paso County, next to the grouping of colonias shown earlier. Cervantes is bilingual and a student at El Paso Community College. We also contracted with Patricia Gonzalez (pseudonym), a long-time resident of Fort Hancock East. Cervantes first went to Colonia Revolución and quickly discovered that this colonia had received training in septic systems and even had rudimentary training materials. Thus, the project team re-focused their attention on Fort Hancock. Upon discussing the project further with Patricia Gonzalez, the project team discovered that all of Fort Hancock East, a total of about 150 residents, had no central sewer systems and problematic water systems. Gonzalez lives in this area and knows firsthand the issues of septic and water. Originally, we had contracted Gonzalez to carry out the work in Fort Hancock and Cervantes, the work in east El Paso County. Meanwhile, Gonzalez obtained full time

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employment but volunteered to help the project team carry out the work there. Cervantes, with the careful guidance of Gonzalez, then carried out the initial needs assessment there in Fort Hancock.

Enrique Cervantes was carefully trained in septic systems and general health and social indicators. He then began his work in Fort Hancock East, going door to door talking to the residents about their quality of life as connected to water, sewer, and health. Cervantes visited 100+ households in six different trips to Fort Hancock, carefully documenting what he saw and what the residents told him about their water, sewer, and health conditions.

Results of needs assessment in Fort Hancock East

First, the residents of Fort Hancock East are almost completely unaware of their septic systems, how they functioned, and how they are to maintain them. About 1/4 of the residents surveyed were born in the United States and 3/4 in Mexico, although all of them are residents of this border area—either on the U.S. or Mexican side. As a group, there is little common knowledge of septic systems as anticipated.

A major problem discovered in this comprehensive needs assessment is the water rate for this colonia, which averages almost 18 dollars per 1000 gallons, nearly nine times the average rate of around two dollars per 1000 gallons. Patricia Gonzalez, for example, showed us her monthly water bill of 90 dollars for just over 4,000 gallons, a very, very small usage of water. She has no plants to water, has one person living in her house, and watches her water carefully.

Enrique Cervantes also assessed the residents' knowledge of septic systems and, not surprisingly, concluded that we need a basic training on fotonovelas that is contextualized in Fort Hancock. Pati Gonzalez suggested using a grandmother and grandchildren as a frame for the fotonovela, based on the makeup of many residents in Fort Hancock East.

Table of contents and objectives for training

Based on the project proposal submitted to the Texas state agency, the project team developed the following content for the fotonovela:

- Understanding and identifying the specific location and design of septic systems in the property.
- Understanding local septic system regulations.
- Contracting with installers to correct problems or improve systems.
- Understanding what wastes can be safely disposed into the septic systems.
- How to properly treat and have septic systems pumped.
- How to identify failures in systems.
- How to facilitate communication between appropriate government authorities and colonias residents on septic issues.

The project team then created a story board about a grandmother who is worried about her septic systems because of the health problems of a grandchild. Thus, the team combined the fotonovela or soap opera frame for the planned content.

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Pati Gonzalez, the Fort Hancock health promoter then secured an agreement with her neighbor to take pictures for the fotonovela on hers and Pati's property. As shown by the final version of the fotonovela shown in the appendix, this person played the grandmother, Enrique Cervantes played the son, and a local friend played the grandchild. We received informed consent from all the people to take these pictures. The project team then took pictures on two occasions to form the foundation of the fotonovela.

Creating the fotonovela

The project leader, Thatcher, then drafted a manual with the story board, created the manual design, uploaded and edited the pictures for use in the fotonovela, and created the first draft of the fotonovela. Thatcher used an EPA manual, translated into Spanish (shown in Appendix B), as a general guide for the fotonovela technical content and Spanish terms; but he worked carefully with Cervantes and Gonzalez to use language and forms of expression that are common for the colonias in this area.

Thatcher distributed the fotonovela to the health promoters, Cervantes and Gonzalez, to the Border Colonias Workgroup, and to other bilingual stakeholders. All provided feedback, helping Thatcher refine some word choices. Thatcher thus produced what the team calls the research or test version of the fotonovela.

Collaboration with the Border Colonias Workgroup

The project team, organized under the non-profit Border Environmental Health Coalition (BEHC) carried out this work in close cooperation with members of the Border Colonias Workgroup, a group that recently has focused significant resources on border Colonias. Members include: Dr. Marcelo Korc, Pan American Health Organization; Gina Posada and Victor Valenzuela, Texas Commission on Environmental Quality; Kathryn Hairston, Ombudsperson, Texas Secretary of State; Yuri Orozco, Public Health Improvement, Texas Department of State Health Services; and Adriana Corona Luevanos, Office of Border Texas Health, Department of State Health Services. The objective of the workgroup is to prepare, coordinate the implementation, and assess annual inter-institutional action plans to reduce the health risks in the most threatened and vulnerable Colonias of El Paso and Hudspeth counties following the mission and roles of each participating institution.

BEHC carried out the research and development of the project, but the Border Colonias Workgroup provided supervision, technical expertise, and agency and institutional support.

Community-based approaches

The research and development of the fotonovela and community meeting followed the well-developed processes of participant-based research and community development. The Colonias Work Group had already developed important relations with the two colonias and had already held community meetings. The two colonias had already identified water and sewer as their most pressing social, economic, and health issues. Thus, the project team met with the colonias leaders in coordination with the Colonias Work Group. The project team proposed tentative table of contents, based on existing research, but the team asked the community leaders to critically discuss the table of contents and the development of the fotonovela.

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Further, it was decided, based on community input, that a community meeting, instead of a teatro would be best suited, for two reasons: First, the fotonovela itself mirrors or mimics the teatro, so in effect, we carried out a teatro during the oral presentation. Second, the participants felt that the topic of the project—septic systems— would be difficult to present in a teatro and not many people would show up. The following Table 4 summarizes how this reciprocal relation worked; the three communities are listed in across the top row and the stages and intervention processes are listed in first column.

Table 4
Summary of integrate project approach.

Integrated Community-Based Research Logic			
	Colonias Residents in West Texas	Border Colonias Workgroup	Project Team/BEHC
Problem Identification	Identify health problems related to water sanitation and sewer	Connect colonias health problems to SDOHs and policies and infrastructures	Connect colonias health problems to environmental health literacy
Needs Analysis	Identify community knowledge of water and sewer problems in light of economic, infrastructure, and cultural realities	Prioritize knowledge and procedural gaps to form most addressable and urgent needs	Assess community base of knowledge and how to raise base knowledge to achieve desired procedural outcomes
Methods Development and Instrument Validation	Identify community methods of education and literacy, emphasizing cultural roles of mothers, fathers, and children	Connect community methods to WHO's "Core questions on drinking-water and sanitation for household surveys" and other valid methods.	Create valid research approaches and instruments that are integrated into community methods and culture
Data Gathering	Partner in gathering data and speaking for communities	Oversee data gathering in light of research and policy	Partner in gathering data and speaking for communities.
Data Analy/ Results	Partner in analyzing data and reporting results	Oversee data analysis/results in light of research and policy	Partner in analyzing data and reporting results
Training Design and Implementation	Identify and make visible community methods of training, emphasizing cultural roles of mothers, fathers, and children	Connect community methods to research results and validated training approaches and processes	Create training approaches that are connected to research results and integrated into community methods
Training Evaluation	<ul style="list-style-type: none"> ▪ How well does the training meet their everyday needs? ▪ How much do the new behaviors improve their health? 	<ul style="list-style-type: none"> ▪ How well does training meeting address the SDOHs? ▪ How can the training be replicated in similar contexts? 	<ul style="list-style-type: none"> ▪ How effective was training in meeting cultural and linguistic expectations and needs of population (CLAS)?
Action Plans	<ul style="list-style-type: none"> ▪ What concrete changes are needed in everyday behavior? ▪ What long-term infrastructure needs need to be addressed? ▪ How are health literacy skills to be further developed? 	<ul style="list-style-type: none"> ▪ How do changes in behavior lead to improved SDOHs? ▪ What infrastructure needs need to be addressed? ▪ How are health literacy skills connected to SDOHs? 	<ul style="list-style-type: none"> ▪ How can results be replicated in other similar health literacy contexts? ▪ How are health literacy skills to be further developed in this population?
Critical integration of experience	<ul style="list-style-type: none"> ▪ How does this literacy training improve their overall literacy capacity? ▪ How does this training influence residents' training abilities for water, sewer, and other literacy areas? 	<ul style="list-style-type: none"> ▪ How effectively are the new knowledge and procedures integrated into an overall health plan? ▪ How does this knowledge influence state and federal policy regarding SDOHs? 	<ul style="list-style-type: none"> ▪ How does this research reveal new insights and strategies into health literacy theory and practice for U.S.-Mexico border populations?

This equitable and strategic partnership shared the power, resources, knowledge, and results and fosters a mutual but critical understanding and appreciation of each partner's knowledge and skills at each stage of the project. This approach naturally facilitates a cyclical process of research, action, and critical integration for all three communities.

Preference research of fotonovela versus EPA manual

Following a long line of well developed research in organizational behavior (Hofstede, 2010; Hampden-Turner & Trompenaars, 2000) and intercultural technical communication (Thatcher, 2012), the project team decided to test the preference of the colonia residents, having them decide if they liked the fotonovela format better than the traditional linear, written, and topic-based format of an EPA manual. As shown in Appendix B, the EPA manual follows all of the cultural and communicative patterns that are predominant in the United States, while the fotonovela—at least theoretically—follows the cultural and communicative patterns common in Mexico and Latin America. In other words, the fotonovela is assessed as more collective, ascriptive, particular, diffuse, inner-directed, polychronic, high context, and unequal power distance, while the EPA pamphlet exhibits the contrastive values. I hypothesized that the five border groups would then connect to each manual based on their eight distinct cultural orientations.

Cross-cultural learning design

Grounded in these appropriate communication strategies, the project team also used a four-stage instructional approach for the colonias residents:

Narratives and scenarios grounding. Based on a long history of organizational culture, civil law legal institutions, and educational practices (Albert, 1996; Kras, 1993), a predominant Mexican approach to learning a new task or issue is by first thinking through all relevant scenarios surrounding the task. This is especially true of low-literate or oral learners, a critical part of the border population. This scenario grounding needs not be exhaustive, but it must be representative and rich in detail, much like the case study approach. This has proven beneficial in many training scenarios for Mexican factory workers working in U.S. maquilas (Thatcher, 2006).

Theory building from scenarios. After sufficient involvement and discussion of scenarios, the learners need to build working theories of the proposed learning objective (Thatcher, 2006). Theory building of this sort is best accomplished by comparing the relevant details of each scenario and subsequently building theories from these comparisons. This kind of theory building critically links the topic to the current context of use. This is especially useful for comparing water and sewer systems.

Analysis and exceptional thinking. One of the weaknesses of using scenarios to develop theories is that a scenario does not usually adapt well to cause-and-effect analysis and to a judicious sense of when exceptions to the rule are important (Thatcher, 2000). Thus, participants in this septic system instruction training will need to move their scenario theories into applicable

cause and effect analysis, looking at which causes are linked to which effects. For example, it is critical to link the condition of the water and sewer systems to corresponding health issues and outcomes. This analysis also must look at weighing the significance of exceptions to the rules, understanding when an exception is ok (see Thatcher, 2000).

Problem solving and application. Finally, the cause-and effect-analysis and exceptions thinking need to move to concrete scenarios of problem solving and application (Thatcher, 2000). This step is crucial because the highly abstract or completely hands-on oral training, which is common in Mexico, especially on low literature populations, works against effective problem solving (Thatcher, 2006). Thus, an important component of the materials will focus on problem solving and application as the final assessment of instructional objectives or outcomes. This is the reason for the developing the teatros and modeling the testing of sewer and water systems.

Understanding these cultural and communicative differences is critical for developing effective instruction in septic system use and water sanitation in border populations. Instructional materials developed in the United States will most likely exemplify U.S. communication and instructional traditions, including what the materials are used for, how one learns from them, and what they empower the reader to do in a specific context. Those not familiar with these U.S. traditions will probably not understand, learn from, or be capable of doing what the U.S. authors intend.

In short, these two pamphlets exemplify how culture and communication patterns are related for either Latino or U.S. generic or Anglo audiences. And thus, they provide a guide for designing health materials based on the cultural characteristics of the target audience. But how well does this process work? Can we anticipate the cultural expectations of a target audience based on our best assessment of that audience's cultural characteristics? What are the preferences for Latino or Hispanic audiences on the border? Do they follow the hypothesized values that the fotonovela contains? If so, why?

Preference research activities

To answer these questions, the project team conducted a simple but powerful preference test of 50 households in Fort Hancock East, asking the residents to carefully read both the fotonovela and EPA pamphlet, and then Enrique Cervantes guided them through an oral preference survey where they indicated their choices. The survey is found in Appendix C. The survey contains demographic information such as birthplace, education, gender, and age; and it asks 10 LIKERT preference questions and 5 open-ended questions. All the questions were designed to assess the preferences and needs of this border audience for the septic training materials.

Enrique Cervantes conducted the research at 50 households in Fort Hancock East (Colonia Esperanza). We provided 20 dollar gift cards for those households who agreed to participate in the research. The research protocol was approved by the Institutional Review Board at New Mexico State University. Cervantes went from house to house; he explained the research purpose and gift card and asked the residents if they wanted to participate. All of the participants

spoke Spanish as a first language, although a few were bilingual. Occasionally, Cervantes had to skip residents who were not capable of reading.

Cervantes entered the household, explained carefully the study, had the participants read and sign the IRB informed consent, and then he asked them to read carefully both the fotonovela and EPA manual. He alternated which manual the residents read first, and according to Cervantes, the reading order had no effect on the results. After carefully reading the manuals, the residents then were asked orally the questions shown on the survey. Cervantes took careful notes. As explained next, the participants were all adults over 21 and ranged in age and education; precisely ½ were born in the United States, and the other half in Mexico. All were from the general Texas-Chihuahua area.

Research results (from 50 surveys)

Demographics

Birthplace and Education: Most were born in Mexico (38) with 35 of these in Chihuahua—the state bordering Texas and New Mexico. 12 were born in USA (all in Texas). All birthplaces corresponded to places of Education—nobody was born in one country and educated in the other.

Gender: 17 men and 33 women.

Average age: 50 with many Mexican-born as older and young U.S.-born.

Languages: All reported having Spanish as first language. 35 reported having levels of either 1 or 0 in English (low or nothing); six reported having 8-10 levels of English. Except for the six bilingual participants, participants exhibited a very low level of English.

Results for preference survey questions

The results for the questions are reported below in Table 5.

Table 5
Results of preferences survey (50 total respondents).

Questions	Results	Initial analysis
1. Fotonovela is easier to understand.	47 totally agree 1 agree 2 totally disagree	Overwhelming preference for fotonovela in terms of ease of understanding.
2. Fotonovela explains more clearly the techniques for inspection and maintenance.	31 totally agree 10 agree 5 disagree 4 totally disagree	Of the 9 who disagreed, 6 were from Texas. All 9 had at least 5 on English level. Good correspondence among language, preference, and English level.
3. The instructions of the fotonovela are easier to follow.	41 totally agree 6 agree 3 disagree 0 totally disagree	Clearly, the fotonovela is easier to follow.

Thatcher: Fotonovelas and Anglo designs in health communications for
Spanish-speaking residents along the U.S.-Mexico border

<i>Questions</i>	<i>Results</i>	<i>Initial analysis</i>
4. The fotonovela presents information in a form more applicable to my situation	32 totally agree 11 agree 4 disagree 3 totally disagree	Clearly, the fotonovela is easier to apply to residents' contexts.
5. The EPA manual better motivates me to maintain my septic system.	24 totally agree 11 agree 11 disagree 4 totally disagree	Seriousness of the tone of the EPA manual seems to motivate residents more.
6. The EPA manual contains better information.	37 totally agree 11 agree 1 Undecided 2 disagree 0 totally disagree	Clear agreement that the EPA manual has better information.
7. The EPA manual is better designed.	28 totally agree 15 agree 2 Undecided 5 disagree 0 totally disagree	Strong agreement that the EPA manual is better designed.
8. The EPA manual takes into account better my needs as a septic system owner.	19 totally agree 18 agree 12 disagree 3 totally disagree	Mixed results on what meets their expectations though slight favoring of EPA manual.
9. The EPA manual is more professionally created.	34 totally agree 7 agree 2 Undecided 6 disagree 2 totally disagree	Good agreement that the EPA manual is more professional.
10. I prefer the design of the EPA manual as a form of written training.	24 totally agree 2 agree 19 disagree 5 totally disagree	11 of 12 who preferred the EPA manual are from Texas. Only one U.S-born participant preferred the EPA manual. 6 who preferred the EPA manual like its information; 5 mentioned the need for more pictures in EPA manual but still preferred it. Some correlation between less education and preference for the fotonovela; more men than women preferred the fotonovela—correlated to higher levels of education in women.
Advantages of the two forms of training.	Fotonovela needs more information; is an inferior or less serious form of instruction. EPA manual needs more pictures.	
Hybrid manual.	A combination of the pictures and story from the fotonovela and information from the EPA is what is generally wanted.	

Discussion of results

Bias control

The first discovery is that despite the training and urging I gave to Enrique Cervantes to make sure the residents simply did not agree with whatever question, we believe that at times some residents favored the strongly agree or agree answers regardless of the questions. I did mix the

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questions, using the agree questions for the fotonovela in the first four and agree questions for the EPA manual in questions 5-10. But there is some tendency to agree, especially with this face-saving population.

Ease of understanding and following

The results showed a very, very strong preference for the format of the fotonovela in terms of ease of understanding and following the instructions. This is especially true for those born in Mexico.

Applicability and inspection techniques

Another clear preference was for residents agreeing that the fotonovela was more easily applied to their situation, and the inspection techniques are easier to follow. Further, we see that all but one Mexican-born and educated participant preferred the fotonovela in these categories. On the other hand, 11 of the 12 U.S.-born and educated participants preferred the EPA manual. Clearly birthplace and education strongly correlate with this preference.

Professionalism and information

There was a clear preference for the EPA manual in these categories, with some residents talking about the “inferior” or “less serious” approach of the EPA manual. There might also be some gender issues with a few men discussing the “old lady” in the fotonovela. Clearly, the EPA manual had more verbal information, and the residents like the security that this information brought them. However, it is interesting to note that a lot of the information that is expressed in writing in the EPA manual is implicit in the context of the fotonovela manual. Thus, this preference might have more to do with the more official-looking written approach, something linked to the writing traditions of Mexico (Thatcher, 2006), which are more clearly linked to law and business. Health and other “less serious” topics are often connected to women’s duties in the home. More research is needed here.

Preferred format for written training

The results showed a clearly mixed response on this topic. 26 preferred the EPA manual, and 24 preferred the fotonovela as the best form of written training. However, it is important to point out that 11 of the 12 U.S.-born residents preferred the EPA manual, and all who preferred the EPA manual had higher levels of English. Thus, there is a strong correlation among birthplace, education, knowledge of English and preference for which manual. The Mexican-born residents with lower levels of English strongly preferred the fotonovela approach.

Takeaways and hybrid approaches

On the open ended questions, it was clear that the EPA manual needed more pictures and the Fotonovela needed more information. Thus, for the final version, I integrated more written information into the fotonovela. I also feel that perhaps involving a man in the fotonovela would give it a more “serious” tone to some participants as well. Finally, being educated in the United States strongly correlates with more written forms of literacy.

Final fotonovela, community meeting and community presentation

After finishing the preference research, the project team carefully compared the two manuals and integrated all information from the EPA manual that was not apparent in the test version of the

fotonovela. This created a more hybrid approach but still used the fotonovela organizational design (see Appendix A).

With the final fotonovela in hand and 500 produced at NMSU's Print Shop, we first organized a meeting at Colonia Revolución for a trial run of the presentation. Alicia Saenz (pseudonym), a graduate student in public health and intern with the Pan American Health Organization, assisted in the work. Ana Mendez (pseudonym), a local promotora or health worker met with four residents and piloted her presentation. After receiving feedback from these residents and Alicia, she prepared her final presentation. Ana is originally from Mexico and just finished her Texas promotora certification. This was her first official project.

The project team then organized a community meeting at the Health Clinic Juan Diego in the colonia Agua Dulce in East El Paso County. Another promotora, Cecilia H., a long time resident, of this colonia, aided in gathering the people.

At this community meeting were in attendance 100 heads of households, plus 20+ children. All were native Spanish speakers and of Mexican ancestry. The presentation was given in Spanish. Ana Mendez presented the final fotonovela on an overhead projector, taking the residents through each page and explaining each concept and step carefully. Then Ana prompted the residents for questions. After the presentation, Alicia distributed a short assessment for the residents, and Ana distributed the 10 dollar Wal-Mart gift cards to the participants.

Participatory assessment of final fotonovela and accompanying presentation

As part of her internship at PAHO, Alicia created a short assessment, following the original project proposal objectives stated earlier.

Summary of findings

The results from the assessment demonstrate that the fotonovela approach, combined with a good question and answer session, are very effective for this target population. In almost every question, the residents were able to answer correctly.

The major findings are that:

- The highest percentage of people answered that maintaining/cleaning/pumping their septic tank was important. [Table 6]
- Most people understand that it's the responsibility of those living in the household to maintain their septic tank. [Table 8]
- The biggest concern that people have regarding septic tanks is the risk of exposure to diseases and infections. [Table 9]
- The top three things people learned were how to maintain the septic system, to be careful of what they flush down the toilet, and to make sure cars and trees are far away from septic tank. [Table 13]
- It seems that most people liked the explanation that was given followed by everything about the fotonovela/presentation. [Table 14]

- About 29% of people answered that pumping the septic tank every 3-5 years was how they planned on maintaining their septic tank. [Table 12]
- More than half of those who responded to the question of whether anything could be done to better the fotonovela, said that nothing needed to be improved. [Table 15]

Positive aspects

- A larger than expected substantial sample was recruited, approximately 100 individuals.
- Participants appeared representative of the community with respect to age, sex, and socioeconomic status.
- A total of 53 surveys were turned in by participants.
- The large majority of participants arrived on time and appeared motivated.
- Participants seemed to like the \$10 Wal-Mart gift card compensation.

Limitations

- Participants had nothing to write on other than their fotonovelas which made it difficult and uncomfortable for them to fill out their questionnaires especially since many were older.
- We are not sure that all of the participants followed the directions given to them on how to fill out the questionnaire.

Evaluation questions for water/Sanitation health education presentation

¿Qué es lo que usted piensa sobre el uso y mantenimiento de su sistema séptico?
[What do you think about the use and maintenance of your septic system?]

Table 6

Response	Percent	No. responses
Important to maintain/clean/drain	37%	20
Important for the family's health and hygiene	19%	10
Necessary	9%	5
Important not to contaminate environment	7%	4
Other	20%	11
No Response/ Nonresponsive	7%	4

¿Qué es lo que usted piensa sobre el pago por el mantenimiento de su sistema séptico como por ejemplo el servicio de bombeo?

[What do you think about paying for the maintenance of your septic system like for example with the pumping service?]

Table 7

Response	Percent	No. of responses
Willing to pay	47%	24
It is expensive/Unwilling to pay	18%	9
Need to have more accessible prices	4%	2
Other	8%	4
No response/ Nonresponsive	23%	12

¿De quién es la responsabilidad de mantener su sistema séptico?
[*Who's responsibility is it maintain the septic system?*]

Table 8

Response	Percent	No. of responses
Mine/ those living in the household	92%	47
No response/ Nonresponsive	8%	4

¿Cuáles son sus preocupaciones sobre el impacto ambiental y en la salud de su sistema séptico?
[*What are your worries regarding the environmental and health impact of your septic system?*]

Table 9

Response	Percent	No. of responses
Sickness/infections	60%	32
Solucionarlos (solving them)	6%	3
Contamination of the environment	4%	2
No den buen servicio (not good service)	4%	2
Other	9%	5

¿Cuáles son dos cosas que usted aprendió gracias a la fotonovela/el Teatro?
[*What are two things that you learned thanks to the fotonovela/ the presentation?*]

Table 10

Response	Percent	No. of responses
How to maintain the septic system	40%	24
Careful when throwing things into the toilet	20%	12
Watch for trees and cars near the septic tank	13%	8
How to evade diseases/ watch the families health	5%	3
To be careful with the environment	5%	3
Other	5%	3
No response/ Nonresponsive	12%	7

¿Qué le gustó más sobre la fotonovela/el Teatro?

[*What did you like most about the fotonovela/ the presentation?*]

Table 11

Response	Percent	No. of Responses
The explanation	25%	13
Everything	21%	11
Information regarding not throwing toxins or certain substances into the toilet	8%	4
The real photographs and story line.	8%	4
Other	20%	10
No response/ Nonresponsive	18%	9

¿Cómo va a incorporar los conceptos y técnicas para el uso y mantenimiento del sistema séptico en su hogar?

[*How are you going to incorporate the concepts and techniques for the use and maintenance of the septic system in your home?*]

Table 12

Response	Percent	No. of responses
Drain the septic tank every 3-5 years	29%	15
Be careful with the maintenance	13%	7
Solucionarlos/ lo que debo hacer (solve what I must do)	8%	4
To be careful with the use of water	6%	3
Other	15%	8
No response/ Nonresponsive	29%	15

Cómo podría ser mejorada la fotonovela/el Teatro?

[*How can the fotonovela/presentation be improved?*]

Table 13

Response	Percent	No. of responses
It's good	61%	31
More detailed explanation	2%	1
Other	4%	2
No response/ Nonresponsive	33%	17

Table 14

Summary of LIKERT results for fotonovela presentation.

Questions	Strongly Agree	Agree	Disagree	Strongly Disagree
Mi conocimiento sobre el uso y mantenimiento del tanque séptico es adecuado. [My knowledge of the use and maintenance of the septic tank is adequate]. No Response: 1 (2%)	30 (59%)	17 (33%)	3 (6%)	
Yo sé cómo usar y hacer el mantenimiento de mi tanque séptico. [I know how to use and maintain my septic tank].	23 (45%)	18 (35%)	10 (20%)	
Conozco técnicas prácticas de cómo usar y mantener mi tanque séptico. [I am familiar with the techniques for using and maintaining my septic tank].	24 (47%)	17 (33%)	8 (16%)	2 (4%)
Mi entendimiento sobre el uso y mantenimiento de los tanques sépticos aumentó como resultado de la fotonovela/el Teatro. [My understanding about the use and maintenance of septic tanks increased because of the fotonovela presentation]. No Response: 2 (4%)	34 (67%)	14 (27%)	1 (2%)	
Yo sé cómo usar y mantener mi sistema séptico como resultado de la fotonovela/el Teatro. [I know how to use and maintain my septic system as a result of the fotonovela presentation]. No Response: 3 (6%)	32 (63%)	14 (27%)	2 (4%)	
Yo aprendí técnicas prácticas para usar y mantener mi tanque séptico como resultado de la fotonovela/el Teatro. [I learned practical techniques for using and maintaining my septic tank as a result of the fotonovela presentation] No Response: 2 (4%)	33 (65%)	14 (27%)	2 (4%)	
Yo recomendaría la fotonovela a mis vecinos. [I would recommend the fotonovela to my neighbors]. No Response: 2 (4%)	36 (71%)	12 (23%)	1 (2%)	

Table 15

Summary of results about perceptions of fotonovela and presentation.

Questions	Excellent	Good	Acceptable	Poor
La calidad de la fotonovela/Teatro. [The quality of the fotonovela and presentation]. No Response: 4 (8%)	37 (72%)	8 (16%)	2 (4%)	
El contenido de la fotonovela/el Teatro. [The content of the fotonovela and presentation]. No Response: 2(4%)	36 (71%)	12 (23%)	1 (2%)	
La utilidad de la fotonovela/el Teatro para mi hogar. [The usefulness of the fotonovela and presentation]. No Response: 2 (4%)	36 (71%)	9 (17%)	4 (8%)	

Discussion of results and implications

Although exploratory, this research indicates some strong connections between cultural values and literacy/communication patterns. First, when presented with the test version of the fotonovela versus the EPA manual, 47 respondents totally agreed and one agreed that the fotonovela was easier to read. Only two totally disagreed that the fotonovela was easier to read, and these two respondents were born in the United States and had higher levels of English. One of the two also commented about the “old lady” as the actress and the other about “inferior” designs of the fotonovela. It is quite common on the U.S. border for some residents to view what is perceived as *Mexican* as inferior; instead, opting for the “superior” U.S. design (Vila, 2003). Further, when I presented these results to a group of stakeholders, three of whom were born in New Mexican colonias (a few miles west of these colonias), they also reiterated the tendency for some in the area to perceive something “as Mexican” as being inferior for some residents. Thus, it seems quite clear that the initial perceptions about attractiveness or ease of reading resides with the fotonovela design for this population.

This perception of the EPA manual as having better information as compared to the test version of the fotonovela also is interesting. A careful analysis of both manuals show that the EPA manual has more concrete information about a few specific areas, but most of this information could be inferred from the drama of the fotonovela. It is also important to point out that with the final version of the fotonovela, which included verbal information in checklists from the EPA manual, the participants at the community meeting found great value in the fotonovela design, not only as a manual, but also as a way to present information on the overhead projector. 76% percent of the respondents at the community meeting thought the quality of the fotonovela was excellent, and 12% thought it was good, meaning that 88% perceived it as a quality approach. The responses for the content and usefulness of the final fotonovela were very similar. The responses about the practice of maintenance and upkeep of septic systems were slightly lower but still showed an overwhelming positive approach. In this way, the fotonovela becomes a *print* theater or teatro, which is a very popular method of imparting health information for this population along the U.S.-Mexico border.

Thus, I suggest that the perceived preference for the information in the EPA manual might have something to do with its overall verbal design: It is crammed with lists and verbal information, showing an overt *fullness* of information that is implicit in the fotonovela. In other words, if fully tested through an experiment, it would be really interesting to see if the EPA design does provide more information as compared to the test version; it seems obvious that the final version, which has more verbal information, seemed entirely adequate for the 100 residents of the community meeting.

Consequently, it seems that for this population of native Spanish speakers, mostly born and educated in Mexico, a hybrid design of manuals might be the most appropriate. The overall design could follow the fotonovela approach, including its connection to the eight value sets and four instructional design approaches for this population; however, this fotonovela approach could be supplemented with key verbal information, not only to make the fotonovela design look *full* of information, but also to combat some of the perceptions of inferiority from some participants.

The second major result is the strong correlation between birthplace (and education) and preference for instructional design. Only one of the 12 U.S.-born residents preferred the fotonovela, while the other 11 preferred the EPA manual. Twenty four of the 38 Mexican-born preferred the fotonovela, but those 15 Mexican-born residents who preferred the EPA manual had, generally, higher levels of English. Thus, exposure to English and U.S. approaches to pamphlets, exemplified in the EPA manual, strongly correlates to preference. This preference is also compounded by the implicit feeling of *inferiority* among some of Mexican values, discussed earlier. Consequently, when assessing the cultural and communicative expectations of the five Hispanic/Latino/Mexican-American groups discussed earlier, it is critical to assess the experience with English and U.S. literacy approaches, a finding that is not counterintuitive but nonetheless, demonstrated in this study. This finding greatly complicates using demographics as the guide, for four of the five Latino groups discussed earlier speak Spanish, but a very specific subset, perhaps the recent immigrants and some Mexican nationals, preferred the fotonovela approach.

Further, the positive results point to the potential of the fotonovela design in both print and oral presentation as a way to use some of the best strengths of the promotora or community health worker but in a more cost-effective basis. As is commonly known on the border, using a local community health educator or health worker, known in Spanish as a *promotora*, is the best way to reach the community. However, the general operating procedures of promotoras is going door to door, visiting the families and residences in their homes. Although ideal and effective, this approach is time consuming and costly. Using the fotonovela approach delivers a similar kind of interpersonal training, drawing on the appropriate cultural values but in much less time. For example, the community training took less than an hour, but the results, based on the assessment, were likely as high as if the hour-long training took place in a home. This suggests a good role for fotonovela-designed research for this community, not as a replacement for the door to door promotora approach, but as a cost-effective way to reach more with less, which might be appropriate in many contexts.

Finally, the theoretical frame, using the eight variables and connecting those variables to concrete features of manual design, seems well founded. Thus, the intercultural data provided by an enormous body of work from intercultural researchers (Trompenaars; Hofstede; House, et al.) is probably a good starting point for assessing the cultural and communicative expectations for health literacy. This connection moves well beyond translation, ethnicity, or demographics and into critical features of culture, as represented by the onion model; these include the sense of self, thinking patterns, and social behaviors. As operationalized in the eight validated variables, these features of culture are a powerful and productive way to assess the cultural profiles of populations and design communications to meet these populations. As a result, we might consider revising the 14 standards of culturally and linguistically appropriate services to include some elements of these eight value sets. Thus, instead of arguing that services need to be appropriate, we can include language to help health care stakeholders understand why and how their services can be appropriate.

Limitations and further research

Of course one of the limitations of this study is based on the preference approach: we could not test actual working knowledge of septic maintenance or whether the fotonovela approach actually works better than the EPA approach. However, it seems clear that the perceived ease of use and strong favorability for this approach are critical dimensions of health literacy. That is, these residents seemed likely to find the fotonovela approach comfortable with their perceived health literacy needs.

Although this intercultural literacy model provides a clear perspective on the connections between culture and communication patterns, we are very limited by the amount of data we have on populations. In other words, census data does not account at all for these variables and the demographics gives us a very unclear view of what we could expect. In other words, the data from the 2010 U.S. Census would lump all five Latino/Hispanic groups into one, which does not account for the cultural and communicative orientations of the different groups based on the more accurate set of eight variables. However, these eight variables were developed and validated at national levels in organizational behavior; thus, it is also difficult to expect these national profiles to provide useful data for different cultural groups.

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