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"The dog and the carrot are both useful to me": Functional, Self-Referent Categorization in Rural Contexts of Scarcity in the Dominican Republic

Jill Brown, Colin A. McDonald, and Fabiola Roman
Creighton University

Categorization by individuals living in different settings within a culture or nation has received little attention. The current study was designed to reveal the categorization styles and reasoning of 2 groups of participants living in the Dominican Republic. One group of 32 participants was from an urban setting with abundant resources; the second group of 44 participants lived in a rural setting with scarce resources. Rural participants were significantly more likely than their urban counterparts to categorize objects in a functional, self-referent way, for example, "The dog and the carrot are both useful to me." Regression analysis showed that the interaction between education and setting predicted functional categorization. In the urban abundance setting more education was associated with fewer functional categorizations. The functional style of categorization may be a unique extension of holistic thinking that is adaptive in certain ecological niches.

Keywords: culture, poverty, Dominican Republic, functional categorization, holistic categorization

People from Eastern (collectivist) and Western (individualist) cultures show differences in numerous cognitive processes, including the processing of visual illusions, linguistics, and causal attribution (Nisbett & Masuda, 2003). For example, when looking at moving fish on a computer screen, persons from the United States are more likely to remark on the central object (the moving fish) while Japanese participants often report information about the field (i.e., the background, water, inert objects; Nisbett & Masuda, 2003). Western individuals tend to make more dispositional attributions, believing that other's behavior is more likely owing to their personality than the situation or the day's events. Eastern cultures are more likely to give a situational attribution for an individual's behavior (Norenzayan, Choi, & Nisbett, 1999).

An area of cognitive ability that has recently been the focus of research is that of categorization, or the organizing and processing of the world (Ji, Zhang, & Nisbett, 2004; Norenzayan, Smith, Kim, & Nisbett, 2002). Two types of categorization have been described in the literature. In taxonomical (analytic) categorization, a person focuses on the central object and its attributes and then reasons about it using categories and rules. In contrast, holistic (thematic) categorization emphasizes the relationships and similarities among objects and events in the broad perceptual and conceptual field. Chiu (1972) first tested categorization by presenting triads of pictures to Chinese and American children and asking them which belong together. He found that, for example, if given a triad of dog, carrot, rabbit, a taxonomic categorization would be dog and rabbit, because both are animals. A holistic categorization would be the rabbit and carrot, because the rabbit eats the carrot and is thus in relationship with it.

These differences have been tested in both US and Asian samples. Although we know that collectivism characterizes the cultures of Central America and the Caribbean (e.g., Jamaica, Trinidad, and El Salvador fall under the collec-

Jill Brown, Colin A. McDonald, and Fabiola Roman, Department of Psychology, Creighton University.

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Correspondence concerning this article should be addressed to Jill Brown, Department of Psychology, Creighton University, 2500 California Avenue, Omaha, NE 68178. E-mail: jillbrown@creighton.edu

tivist label in Hofstede's national cultural dimensions; Hofstede, 2002), no studies on categorization have been conducted in these contexts. Because of its collectivist culture, we predict that higher rates of holistic than taxonomical categorization will be reported in the Dominican Republic (DR), a Caribbean nation where the dominant language is Spanish.

While the broad cultural orientations of individualism and collectivism correlate with categorization, more nuanced factors have also been linked to categorization. For example, in the United States, high power, high socioeconomic status (SES), and less religious affiliation predict taxonomical categorization over holistic (Miyamoto & Ji, 2011). There is also evidence that ecological environments contribute to different cognitive styles and ultimately categorization (Knight & Nisbett, 2007). However, only limited research has looked within cultures for these ecological niches. Regional studies in Italy revealed that southern Italians used more holistic reasoning and northern Italians used more taxonomical reasoning, but SES did not significantly predict reasoning style (Knight & Nisbett, 2007). Similarly, people who migrated within interdependent cultures to regions of growing economic affluence used more independent cognitive strategies than their nonmigrating counterparts who used more interdependent cognitive strategies. (Kitayama, Ishii, Imada, Takemura, & Ramaswamy, 2006).

Miyamoto and Ji (2011) tested how SES, defined in terms of educational achievement and income, was related to categorization. Random samples of 1,223 graduates of Wisconsin high schools in 1957 of varying income and education were surveyed. Each participant completed the categorization task but was not asked to explain the reason behind their categorization. Participants with a higher income and educational achievement categorized more taxonomically than those who had a lower income or educational achievement.

Differences in categorization have also been observed in pilot work in the DR. The impetus for this study came from a class in Cross-Cultural Psychology offered by the first author in the DR. One assignment the students were given in three separate semesters was to take Chiu's (1972) stimuli and test them with two Dominican participants. Each semester students would bring back the responses and try to fit them into either taxonomical or holistic categories. Consistently, the answers did not fit but began to paint a small picture of a unique category of answers, using the self as referent and reasoning only with utility to self or family. This study explores this type of categorization, functional categorization, which has elements of holistic reasoning but also uses first person self in relationship to the broader context, consistently pulling self into explanations of what "goes together." Thus, when participants chose dog and carrot in the triad choice of dog, carrot, and rabbit and their reasoning included some variation of "The dog and the carrot are both useful to me," a third style became apparent, the functional, self-referent style of categorization.

Contextual factors that vary greatly in the DR include access to formal education and material resources. Education is a marked predictor of a range of cognitive processes. Formal education provides explicit knowledge of techniques of learning (identifying sentence structure, or dividing by 10's) and the content that we learn (the number of African countries, memorizing Shakespeare's "To Be or Not to Be" soliloquy). Schooling, and particularly formal schooling, leads people to think in ways that are different from those who do not attend school. Luria (1976) examined taxonomical categorization among farmers in Uzbekistan who had never attended school. He asked participants which of the four did not belong: a hammer, a saw, a log, and a hatchet. To solve the problem, the participants are required to conceptualize the underlying commonality, using the objects to form a category—tools in this example. Luria found that few participants identified the attributes that the objects shared. Wassmann and Dasen (1994) report that when Yupno peoples of New Guinea were given a sorting task, illiterate women used their socially sanctioned field of experience when sorting objects, while literate Yupno used the taxonomy of "color" when sorting objects. Formal schooling appears to facilitate abstract reasoning, applying a rule based on logic rather than on personal experience (Keller, 2011).

Living with limited material resources may also affect categorization. Scholars argue that individuals living with few resources have a unique everyday context in which they use pragmatism and resourcefulness to promote survival. This "culture of everyday life" is marked with inventiveness and struggle (Kumar, 2010), which may be repre-

sented in how participants organize and categorize their world. Therefore, our second hypothesis is that functional categorization, based on usefulness to the individual, will be found more in rural areas that have limited material resources than in urban areas with more resources.

Cultural Context of the Study: DR

The DR is located in the Caribbean Sea and shares the island with the neighboring country of Haiti. Extended family and compound households are predominant in the DR, both in rural and urban settings; Dominicans characterize themselves as traditional and conservative in part as a reflection of family and religious values, such as clear-cut gender norms, respeto (respect), and machismo (Vazquez, 2005). Families living in both urban and rural locales depend on each other for economic stability. While urban life has shifted the intensity of economic interdependence because women have more access to jobs and education, a shared cultural meaning system exists in the DR, with values that still connect rural and urban, rich and poor, men and women (Vazquez, 2005). The official language of the country is Spanish, but the nation is heavily influenced by the United States owing to the large number of Dominican immigrants to the United States who maintain financial and other ties with their relatives in the DR. The gross domestic product of the country per capita in 2012 was US$5,746.00 (World Vision, 2013), and the main sources of revenue are tourism, coffee, tobacco, sugar, and ferronickel and gold mining. Today, a quarter of the population lives below the poverty line and 17% are unemployed (CIA Factbook, 2010). A laborer wage in the DR is between 3,000 and 6,000 pesos/month (US$70.00–US$140.00).

Method

Participants

Seventy-six participants were recruited through convenience sampling of two different ecological settings within the DR. Forty-four of the participants resided in rural communities with limited access to high school education, electricity, and running water. Fifteen of these participants were from the mountain village of Ceboruco and the other 30 lived in the village, Las Lajas. Ceboruco has a population of nearly 120, is agriculturally based in the northern mountainous region of the country. Las Lajas is a slightly larger community of around 150, located in the center of the country, where the primary economic activities are raising livestock and selling local art. In both communities, convenience snowball sampling was used to recruit participants. Once a participant had been identified through a contact in the community, he or she was asked to recommend others for participation. Participants in the second ecological context were recruited from middle to upper class neighborhoods in Santiago, the second largest city in the DR. Seventeen of the participants were recruited at La Plaza Internacional, a shopping mall with high-end shops, and the other 15 were recruited from a different outlet mall, Bella Terra. Researchers approached every fifth person who walked into each shopping center.

Participants in both settings were reimbursed for their time with 100 pesos (equivalent to US$3). Although it was assumed that the rural families would be living with fewer resources and the urban participants would be living with more resources, measures of income, education, and number of people in the household were also collected.

Materials

Notecards with the name and an image of the objects in the triads (i.e., dog) were created through pilot testing both contexts in the DR in spring 2012. Each triad needed to have an analytic (taxonomical) pair, a thematic pair (holistic) pair, and a pair that could potentially be useful (functional) to people in the DR. The process took 4 months and went through several iterations of triads. To begin, lists of useful objects for both rural and urban communities were generated. Triads were created and tested, and discrepancies were resolved through discussion with research assistants in the DR and the United States. The photos accompanied the words to accommodate participants who were not literate (Appendix A). A recorder was also used to capture the verbal responses in the rural setting. Transcription and coding of the categorization (i.e., taxonomical, holistic, or functional) reasoning were done by the authors. A paper and pencil demographic information sheet that inquired about education, income, travel outside the DR, and other variables was also administered.

Procedure

To collect the data, the second and third author traveled to the DR for a 2-week period. After obtaining informed consent in line with APA ethical guidelines and ensuring that the participants understood confidentiality, each participant was asked a set of demographic questions (Table 1) and then presented with eight sets of triad (three word) categorization tasks. For each categorization task, the participant examined three cards with the name and an image of the object on each card; then participants were asked to select two cards out of the three that go together. Three triads were used as filler items, where no significant relationships were present among the three objects on the cards. After selecting the two that went together, participants were asked to explain their choice. The order of the triads was varied to reduce order effects. Responses were written and/or audiotaped for the rural/scarcity group and then transcribed. This was done to ensure that literacy was not a prerequisite for participation in the scarcity condition. For the abundance group, participants wrote out their explanation only. Verbal responses were used in only seven occasions in the rural/scarcity data analysis. All interviews were conducted in Spanish, and responses were then translated into English for coding.

In the first round of coding, all three authors and an independent fourth coder categorized participants' choices into taxonomical, holistic, or functional, based both on the pair they chose, and the reason they gave for why they went together. Next, categories were compared, and discrepancies were discussed by the four coders. When the pair chosen was discordant with the reason given, we favored the reason over the choice of the pair. Finally, all three authors independently recoded until consensus was reached. To directly test the hypothesis, scores for functional, holistic, and taxonomical categories were created. The number of functional responses was the count of functional choices out of a possible 5. As there were five triads, a functional score of 4 indicated that the participant answered with 4 out of 5 functional reasoning for all triad pairings. The holistic and

Table 1
Demographic Characteristics of the Participants

	M	*SD*	*N*	*d*
Rural/Scarcity				
Age	36.5	16.8	44	0.32
Education*	6.6	4.9	44	−1.8
Income (pesos)[a,*]	403.8	697.5	44	−1.1
Individuals in household	3.7	1.5	44	−0.5
Wage earners*	1.1	0.99	44	−0.6
Number of family members that live outside the DR*	0.6	0.5	44	−0.9
Left DR*	0 (0%)			
Functional	4.45	1.04	44	3.9
Taxonomical	0.57	1.2	44	0.46
Holistic	0.02	0.15	44	−5.4
Urban/Abundance				
Age	31.5	13.8	31	
Education*	14.4	3.3	29	
Income (pesos)[a,*]	9,889.4	12,642.4	19	
Individuals in household	4.16	1.18	31	
Wage earners*	1.7	0.9	30	
Number of family members* who live outside the DR	0.94	0.25	31	
Left DR*	16 (51%)			
Functional	0.38	1.0	32	
Taxonomical	0.16	0.36	32	
Holistic	4.3	1.1	32	

[a] 1 USD is equal to 42.8 Dominican pesos.
* Denotes significant difference of $p < .05$ between groups.

taxonomical responses were counted in the same manner. Codes were then compared, and again discrepancies were discussed (Appendix B). Interrater reliability was calculated for three coders using the intraclass correlation coefficient. Using a two-way mixed, absolute agreement model, the average coefficient was .92, with a 95% confidence interval of .81–.97.

Results

Demographic characteristics of the sample are displayed in Table 1. Table 2 shows the raw data by triad and context. A paired sample *t* test was used to test the first hypothesis that across contexts, holistic categorizations would be more frequent than taxonomical. In support of the hypothesis, participants used holistic reasoning ($M = 2.17$, $SD = 2.19$) significantly more than taxonomical categorization ($M = 0.08$, $SD = 0.27$), $t(75) = 8.39$, $p < .001$. The effect size was $d = .89$. Next, independent *t* tests were conducted between the two ecological contexts with the three categorization styles (taxonomical, holistic, and functional) as the dependent variables. Participants in the urban/abundance setting had significantly more taxonomical responses ($M = .16$, $SD = .37$) than the rural/scarcity sample ($M = 0.02$, $SD = 0.15$), $t(73) = -2.1$, $p = .03$. Holistic responses were also significantly more frequent in the urban/abundance setting ($M = 4.3$, $SD = 1.1$) than in the rural/scarcity setting ($M = 0.57$, $SD = 1.2$), $t(73) = -13.7$, $p < .001$. Participants living in the rural/scarcity condition had a mean score of functional responses of 4.45 ($SD = 1.045$), whereas participants living in an urban location had a mean of 0.23 ($SD = 0.560$). As hypothesized, rural participants had significantly higher mean functional scores than urban participants, $t(73) = 20.63$, $p \leq .001$. See Figure 1.

Correlations and a multiple regression analysis were computed to examine the relationships between functional reasoning and various demographic and ecological predictors. A multiple regression was conducted to evaluate whether independent ecological predictor variables (i.e., education, income, and exposure outside the DR) and their interactions added to the predictor variable of context in predicting functional categorization. The correlations among all the variables included in the regression analyses are presented in Table 3. Table 4 presents the standardized and unstandardized regression coefficients, the standard error, and R^2 for the regression model.

In the regression model, ecological setting (rural/scarcity vs. urban/abundance) variables intended to capture participants' demographic characteristics of education, income, and exposure outside the DR (which included whether the participant had ever left the DR and the number of family members who had left the DR) and the interaction effect between the key demographic variables and the ecological context variable of rural/scarcity and urban/abundance were entered into a regression. The interaction between ecological context and education on functional responses was significant, $F(1, 61) = 128.9$, $p < .001$, and the model accounted for a total of 68% of the variance. For rural participants, education did not significantly predict whether they used functional categorization (as it was the preferred style); however, in the urban/abundance, education did predict categorization style, with more education associated with lower numbers of functional categorizations (Figure 2).

We did not run an analysis on taxonomical categorization, as only 19 responses in the entire dataset were coded as taxonomical. Further, we did not run an analysis on the holistic responses,

Table 2
Numbers of Participants Using Each Type of Categorization (Percentage) by Triad and Context

	Urban/Abundance			Rural/Scarcity		
Triad	Functional	Holistic	Taxonomical	Functional	Holistic	Taxonomical
1	0 (0)	32 (100)	0 (0)	26 (51)	16 (36.4)	2 (4.5)
2	5 (15)	25 (66)	2 (6)	40 (91)	4 (9)	0 (0)
3	2 (6)	30 (94)	0 (0)	26 (59)	8 (18)	10 (22)
4	1 (3)	31 (97)	0 (0)	22 (50)	19 (43)	3 (7)
5	1 (3)	26 (78)	5 (18)	36 (82)	4 (9)	4 (9)
Total	9	139	7	150	51	19

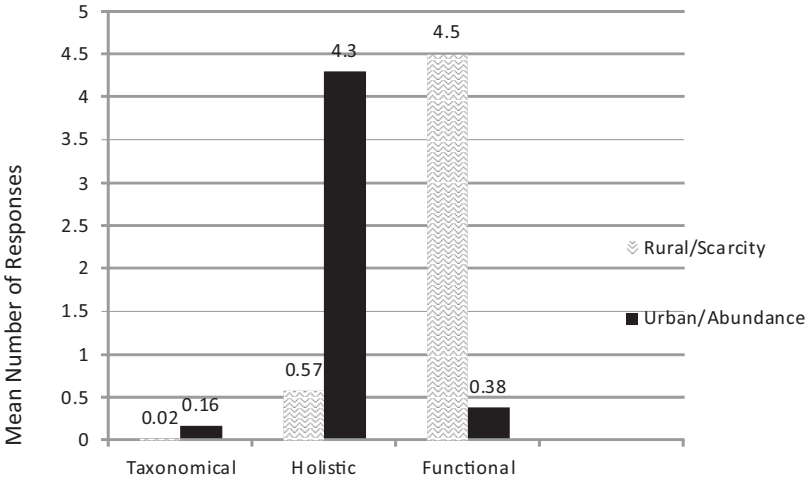

Figure 1. Mean cognitive categorization patterns for the Rural/Scarcity and Urban/Abundance settings.

as they were highly negatively correlated (−.95) with functional responses.

Discussion

In this study, we investigated cognitive categorization in two ecological contexts in the DR. Data supported our initial hypothesis that holistic categorization is favored over taxonomical across both contexts. This finding supports previous research that persons in collectivist societies are likely to use holistic categorization styles (Chiu, 1972; Ji, Zhang, & Nisbett, 2004). Very little taxonomical categorization was found in either context in the DR. Further, functional categorization was evident and was the preferred style in a rural, resource scarce setting. In the rural/scarcity context, participants' reasons for why the objects belonged together included the objects' utility and relation to the self. Within the DR, different ecological niches are associated with dramatic differences in cognitive categorization style.

To our knowledge no other researchers have identified functional categorization as a third style of categorization or as subtype of holistic categorization. We consider this response style to be a unique extension of holistic thinking that is common in a particular ecological environment of rural/scarcity. Let us first revisit the definition of interdependent self-concept, one of the defining

Table 3
Correlations Among and Descriptive Statistics for Key Study Variables

	Education	Income	Left DR	Number of family left	Scarcity/ Abundance	Functional	Holistic	Taxonomical
Education	1.00	0.449***	0.457***	0.294**	0.616***	−0.574***	0.582**	0.079
Income		1.00	0.635***	0.215	0.520***	−0.434***	0.380**	0.276*
Left DR			1.00	0.224*	0.606***	−0.584***	0.565***	0.088
Number of family left				1.00	0.369***	−0.283**	0.268**	0.169
Scarcity/Abundance					1.00	−0.898***	0.848***	.244***
Functional						1.00	−0.949***	−0.269*
Holistic							1.00	0.156
Taxonomical								1.00

Note. *n*'s range from 63–76 due to occasional missing data. The variable Left DR, was coded 0 = no, 1 = yes. The variable Scarcity/Abundance was coded 0 = scarcity (rural), 1 = abundance (urban).
* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4
Summary of Regression Analysis for Factors Predicting Functional Categorization

Variable	B	SEB	β
Scarcity/Abundance	−1.9	1.3	−.416
Education	.035	0.034	.09
Income	.01	0.01	−.36
Left DR	.17	0.61	.02
Number of family left	.26	0.33	.05
Scarcity/Abundance × education	−.22**	0.074	−.79
Scarcity/Abundance × income	.01	0.00	.401
Scarcity/Abundance × family left	.91	1.2	.19
R^2 values	.68*		

* $p < .05$. ** $p < .01$. *** $p < .001$.

features of collectivism. It is defined as "viewing the self as one in relation to the whole" (Nisbett et al., 2001). Participants in the rural/scarcity context pull themselves into the task and reason within a framework of the function and usefulness of the objects to themselves, their families, or communities. If their context is thought of as the "whole" then participants appear to be answering by including themselves in relation to the objects, in line with an interdependent self-construal (Markus & Kitayama, 1991). In the literature, holistic reasoning has been defined as "an orientation to the context or field as a whole, including attention to relationships between a focal object and the field and a preference for explaining and predicting events on the basis of such relationships" (Masuda & Nisbett, 2001, p. 923). In our rural/scarcity condition, the focal object is the self. So, although this might be an extension of holistic thought, it varies greatly from other holistic thinking that excludes the self as referent. In the first question, we presented participants with a dog, carrot, and rabbit and then asked then "which two belong together?" In the rural/scarcity setting, participants' responses ranged from the very straightforward "The dog and the carrot because they're both useful to me" to "I like carrots because I can make salads, and the dog protects us." Even when participants chose the typically taxonomical response of the dog and the rabbit, in the rural/scarcity context it was never reasoned "because they are animals," which is the taxonomical response. On the contrary, participants reported their utility and function, "the dog is a good friend and takes care of the house and rabbits are easy to raise and keep." Similarly, when participants in the rural/scarcity condition chose the typically holistic response of the rabbit and the carrot, their reasoning again was functional; "rabbits you can eat and carrots are plants that give nutrition to my people."

Those reflections on personal experience and usefulness were also observed in early studies by Luria (1976). He asked uneducated people in Uzbekistan to consider the following syllogism: In the far north all bears are white. Novaya Zemyla is in the far north. What color are the bears in Novaya Zemyla? The most common response was "why don't you ask the people who have been there?" Participants in the scarcity condition also showed a reluctance to generalize or use abstract logical reasoning beyond practical experience and usefulness to themselves.

There is a rich literature on using the self as a referent in cognitive research (Symons & Johnson, 1997). Processing information in a self-relevant way may be the "usual" method of processing (Catrambone & Markus, 1987), as people have more expertise about themselves than any other structure in memory (Markus, 1977). Self-referent memory also aids in general memory. Cunningham, Turk, Macdonald, and Macrae (2008) in two separate experiments found a significant memory advantage for objects that were owned by self. Later, Cunningham, Brady-Van den Bos, Gill, and Turk (2013) designed a study to link the self-referent effect in memory to survival-based encoding. In conditions where participants were made aware of their survival versus a semantic condition, a memory advantage was found. Although these effects have been found with memory in general, they might generalize to categorization.

To live day-to-day with limited resources may sharpen one's focus on ways to promote survival (Cunningham et al., 2013). This might be a cognitive difference expressing what Kumar (2010) refers to as a culture of resourcefulness and pragmatism. In the rural/scarcity condition, participants' cognitive reasoning had undeniable elements of self, and used self and context in a reasonable and logical way that did not appear to use abstract ideas and theories. Perhaps both are the product of living with limited resources.

The broader ecological setting of rural/scarcity and urban/abundance captured a large portion of the variance in the model. Participants in the urban

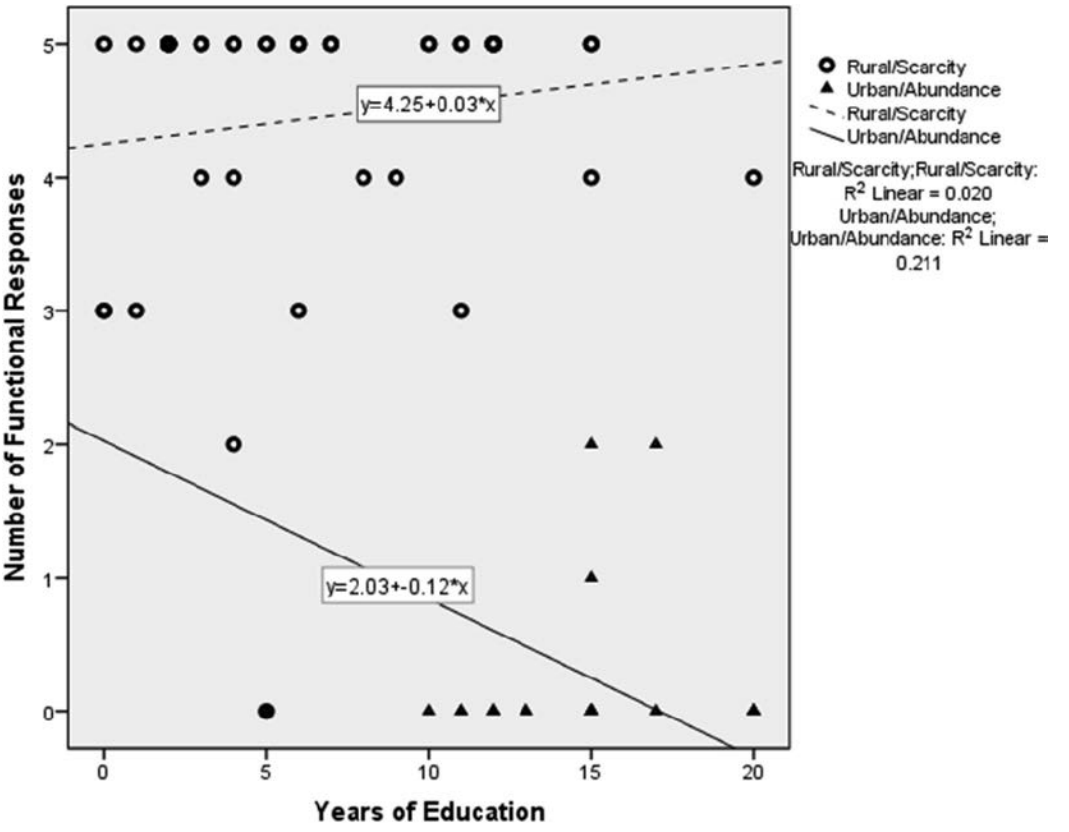

Figure 2. Interaction of rural/scarcity, urban/abundance, and years of education on functional categorization responses.

sample who had more education used functional categorization less, but there was no relation in the rural sample. Perhaps there is a threshold of education that promotes more holistic and less functional reasoning, and because education levels were so low in the rural sample, few or no participants reached that threshold. More research regarding the contexts needs to be conducted. For example, the day-to-day economic activities (subsistence agriculture vs. commerce and trading) that prevail in the two settings may contribute to differences in categorization. In addition, the types of conversations that transpire in rural/scarcity settings versus urban/abundance settings may encourage and direct categorization as well as limited resources and survival based needs. More needs to be known about what actually constitutes these two ecological contexts.

Results from the urban/abundance participants were overwhelmingly holistic in nature (Table 2) and, while education, income, and our proxy for acculturation (exposure outside the DR) all predicted fewer functional and more holistic responses, these factors were not associated with increased taxonomical, but rather holistic categorization. This implies that the prevalent reasoning style in the DR is an interdependent cultural reasoning style that varies by context in terms of functionality and relation to self.

A pressing debate in the literature is whether there are cultural differences in general cognitive capacities that can be measured by specific tasks. Cole (1996) approaches this question within the perspective of a cultural–historical framework. If cognitive differences in any realm do exist, research must examine those performances in the contexts where cognition is actually enacted. For example, among Kpelle formers in Liberia, estimates of amounts of rice are more accurate than among white Americans. This finding holds in the

face of Kpelle farmers' failure to sort patterned cards following a relatively simple rule. Similar to Cole's line of research, the current study set out to examine cognitive categorization in two everyday contexts within the DR where cognition is carried out and striking differences between two ecological contexts were revealed.

Limitations

A significant limitation to our study was that participants in the rural/scarcity setting answered verbally if they were unable to write their responses while the participants in the urban/abundance setting wrote all responses. This leaves some unanswered questions. For example, does speaking promote functional and self-referential reasoning in a way that writing does not? A better method would have been to have all participants answer verbally. Another limitation of the study was that although a great deal of attention was paid to making the triads relevant to a resource scarce context (life in the countryside), the same attention was not given to the resource abundant setting. If the task had involved objects that were particularly useful or functional in an urban abundant setting (bus ticket, IPad), would urban participants also have reasoned functionally. Further, we did not have a well-defined measure of abundance and scarcity. Rather, we used rural/urban living, income, and education as proxies for abundance and scarcity. The two communities are markedly different, and represent distinct ecological niches, one being traditional agriculturalist, the other urban wage earners. A more thorough description of the contexts might have allowed us to relate the styles to particular features of the environment. For example, additional samples from urban scarcity populations and rural wage earners could have been used as controls to compare cognitive thought patterns.

Implications for Research, Practice, and Consultation

Adams, Bruckmiller, and Decker (2012) charge that to decolonize research is to de-naturalize patterns that are characteristically found in Western settings. Overwhelmingly, taxonomical categorization is privileged as the natural standard of cognitive reasoning. However, the participants in this study used almost no taxonomical categorization. The implication of these results for both research and practice is that context matters deeply. The ramifications of the importance of context for cognitive processes could be of consequence in education and health care in the DR.

Educationally, the DR requires primary compulsory education (one year preschool, nine years primary, with the last 3 years being noncompulsory; Zakha, 2006). Rather than adopt a curriculum based mostly on analytical, abstract thought, these results highlight the value of adapting lesson plans to the student ecological niche. Students living without resources are using functional reasoning; therefore, concepts primarily taught from a perspective that engenders taxonomical categorization only, may be more challenging for them to understand and outside their usual field of social experience and preferred categorization style. Instead, an increased focus could be placed on incorporating functional concepts in assignments and exercises, with gradual introduction of other forms of reasoning, such as taxonomical categorization. Similarly, health care policy may benefit from these findings, as they reveal potential means of improving care by modifying prevention messages and treatment explanations to incorporate functional reasoning.

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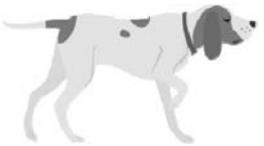
Appendix A

Triads for categorization task

Perro



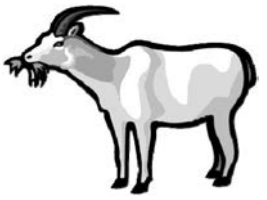
Zanahoria

Conejo

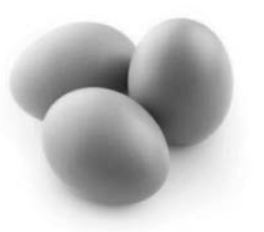
T = dog, rabbit; H = rabbit, carrot; F = dog, carrot

Serpiente

Chivo



Huevos



T = snake, goat; H = snake, eggs; F = goat, eggs

Abeja

Miel

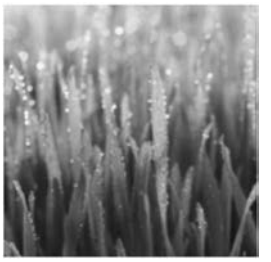
Vaca

T = bee, cow; H = bee, honey; F = honey, cow

(*Appendices continue*)

Vaca

Hierba



Grano de Café

T = grass, coffee bean; H = cow, grass; F = cow, coffee bean

Caballo

Gato

Leche

T = horse, cat; H = cat, milk; F = horse, milk

T = Taxonomical response, H = Holistic response, F = Functional response.

(*Appendices continue*)

Appendix B

Examples of Functional, Holistic, and Taxonomical Explanations

Cognitive pattern	Pairing	Response
Functional	Dog–Carrot	The dog helps people in protecting; the carrot is used as my food.
Functional	Carrot–Rabbit	Rabbit you can eat; carrot is a plant and gives nutrition to people.
Functional	Eggs–Goat	Eggs can be eaten and the goat produces milk for my children.
Functional	Horse–Milk	I can ride the horse, and I can drink the milk.
Holistic	Rabbit–Carrot	The rabbit eats the carrot.
Holistic	Bee–Cow	The bee produces honey, and the cow produces milk.
Holistic	Cow–Grass	The cow uses the grass for nutrition.
Holistic	Cat–Milk	The cat is nourished by the milk.
Taxonomic	Goat–Snake	They live in the same habitat.
Taxonomic	Horse–Cat	Both belong to the Animal kingdom, are mammals, and are four-legged.
Taxonomic	Goat–Snake	Because both are animals.

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