

**A Methodological Trajectory
to Investigate Cultural Models:
Blending Two Approaches.**

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Abstract.

In the research about cultural models, Bennardo and De Munck (2014) have recently proposed a blend of the two most popular methodological approaches—linguistic and experimental tasks. In order to assess the validity of that proposal, we used the newly suggested methodology to investigate the American cultural model of nature. This cultural model had already been investigated by Kempton, Boster and Hartley (1995). While these latter authors focused on a stratified sample of the American population, we restricted our investigation to a particular area of the US, Northern Illinois. Our results provide supporting evidence for the validity of the new methodology used insofar as it replicates the results of the previous investigation, while at the same it adds nuances to the cultural model elicited. We believe that the blended methodological approach we used could become a new standard for the research on cultural models.

Introduction.

Cultural model theory represents one of the major advances in contemporary cognitive anthropology (D'Andrade, 1995; Kronenfeld et al., 2011; Bennardo and De Munck, 2014).

While most researchers agree on the basic theoretical tenets of such an approach to culture and mind, scholars differ substantially in the methodology they employ to pursue their research goals. For ease of treatment, we can divide the various approaches into two main camps: the linguistic approach, based on the analyses of linguistic data collected by means of interviews: open-ended and/or semi-structured (see Quinn, 2005a); and the consensus analysis approach, based on the quantitative analyses of data collected by means of free listing tasks followed by sorting tasks and/or questionnaires (Romney, 1999; Weller, 2007).

A blend of the two approaches has been recently proposed by Bennardo and De Munck (2014). In order to assess the validity of this new methodological trajectory, we conducted data collection activities and used a number of analyses on the data that corroborate the soundness of that suggestion. The American Cultural Model (CM from now on) of Nature on which we focused our attention had already been investigated only quantitatively by Kempton, Boster and Hartley (1995). We restricted our investigation to a particular area of the US and added a good number of linguistic analyses to their methodological approach. Finally, we closed our investigation with a consensus analysis to further verify our findings.

Our results provide supporting evidence for the validity of the methodology used insofar as it replicates the results of the previous investigation, while at the same it adds nuances to the CM elicited. We believe that the blended methodological approach we used should become a new standard for the research on CMs. It represents a clear enrichment of the possibilities that this research offers to scholars interested in the cultural organization of mental knowledge.

Blending Two Methodological Approaches.

Scholars favoring the linguistic approach to investigate CMs clearly admit the limited insights that language by itself can provide into the shared mental organization of knowledge in communities. However, they accept this limitation and suggest that their findings represent a necessary initial step towards the sought understanding (see Holland and Quinn, 1987: 5).

Different types of interviews are conducted and then carefully transcribed. The texts obtained represent the material on which analyses are conducted. Examples are: key words analysis, gist analysis, metaphor analysis, and reasoning (including causation) analysis. This latter is typically used as a 'verification' stage for the discovered models.

Scholars favoring the consensus analysis approach rely mostly on the quantitative analysis (frequency, MDS, and consensus) of data obtained by means of tasks such as free-listing and sorting tasks. Structured questionnaires containing statements with agreement scales are also administered and the results analyzed to highlight consensus among the respondents as well as specific groupings of agreement (Romney, 1999; Borgatti and Halgin, 2011; De Munck, 2011). Both approaches are rooted in previously obtained extensive ethnographic knowledge of the community to be investigated (see Gatewood, 2012). However, often this stage is left out because of the extensive familiarity of the scholar/s with the community.

In 2014, two of the authors of this work (Bennardo and De Munck) suggested that an ideal methodological trajectory intended to discover CMs should include a number of strategies for data acquisition and data analysis that represent a necessary blend of the linguistic and quantitative approaches just outlined. The proposal started with the statement that any research on CMs needs to start with the acquisition of ethnographic data about the community

investigated (Bennardo and De Munck, 2014: 100). The insights obtained from these data guide and mold the subsequent research stages.

The second step of the trajectory includes the acquisition of linguistic data obtained by the administration of semi-structured interviews. Questions should be chosen about a related topic that would require the interviewees to activate the CM targeted and not be asked directly about the CM investigated—this is because the interviewees hold the CM partially or completely out-of-awareness (see D’Andrade, 1987: 114). The data obtained can then be transcribed and analyzed.

The results of the analyses on the ethnographic and linguistic data provide enough information to arrive at the delineation of a CM. This preliminary finding is used to design, prepare, and administer experimental tasks. The results of these analyses also provide the language out of which to construct the questionnaire to be used for the final consensus analysis. In addition, the experimental data contribute data onto which consensus analysis can already be conducted. Finally, one would compare the results of the two consensus analyses to verify the CM already obtained by the previous analyses and explore its relative distribution within the population.

We thought that this new methodological trajectory deserved to be used to see if it could yield any improvement in investigating a CM already discovered by previously limited methodological choices. The focus of our attention fell on the American CM of Nature² investigated and presented by Kempton, Boster, and Hartley (1995, Chapter 3) (from now on KBH). They conducted interviews with a number of focus groups and then constructed a

² We capitalize Nature when the word appears as defining a CM. We also want to draw attention to the fact that capital letter ‘Nature’ and small letter ‘nature’ have two distinct meanings. The latter is typically intended to mean a specific part and type of the environment (e.g., woods, trees, rivers, etc.) or some biological given aspect of existence (i.e., instinct), while the former may include all that exists.

questionnaire requiring the expression of agreement about statements about nature, environmental values, and policy making. These statements were chosen from an analysis of the interviews (details of the linguistic analysis are not disclosed). The results of the questionnaire were carefully analyzed quantitatively in a thorough search for overall and local (i.e., subgroups) consensus. A comprehensive CM of Nature was discovered even though the research goal was mainly about environmental values.

The CM of Nature presented by KBH consists of three parts with these characteristics:

1. Nature as a Limited Resource upon which Humans Rely:

Nature as a closed system, so our effluents return to us; Nature as home; Protecting environment is for our benefit.

2. Nature as a Balanced and Interdependent System:

The interdependency and chain reactions in nature; Interdependencies are complex and unpredictable; Humans should not interfere.

3. Nature as separated from society and its subsequent devaluation:

Materialism and the market system devalue nature; Alienation and a loss of contact with nature; Idealization of primitive cultures as environmentally friendly and sustainable.

Our investigation was conducted in North Eastern Illinois, the area where Northern Illinois University (NIU)—the Institution to which all the students authors and the first author belong—is located. Similarly to KBH, we did not conduct an ethnographic data collection. In our case the choice was dictated by the fact that we felt we had enough cultural understanding of the area chosen.³ We varied the sample for our interviews in terms of age, gender, profession, religious

³ We do not recommend such a procedure to be used in a community that might be even slightly different from (or in some cases, much larger than) that of the investigator/s.

affiliation, and locality (rural vs. urban) in an attempt to make it as much as possible representative of the typical population of the area/community chosen. We also want to point out that our community was much smaller than the previous research by KBH that attempted to study the whole of the US.

Our methodological trajectory ended up being not as thorough as the one suggested by Bennardo and De Munck, but it was certainly closer to that model than the one by KBH. We added extensive linguistic analyses to the texts we obtained by semi-structured interviews and we constructed the questionnaire for the final consensus analysis by using the results of those analyses. Therefore, while we did not conduct the ethnographic data collection as suggested and did not use any free listing tasks or sorting tasks (or other experimental tasks), we are convinced that our methodology was close to the model we wanted to assess.

An American Cultural Model of Nature Revisited: Interviews about Climate Change.

We started our investigation by conducting semi-structured interviews with eight male and seven female subjects ranging in age from 21 to 56 (av. 36.5). All subjects reside in North Eastern Illinois, including DeKalb County (NIU main campus is in this county) and the metropolitan area of Chicago. The topic of the interviews was climate change and a keen attention was devoted to causal explanation and ideas about constitutive characteristics of Nature. All the interviews were later transcribed.

The second stage was that of analyzing the texts obtained. We conducted a key word analysis followed by a semantic role analysis, in which the most frequent key word found, i.e., human/s, was checked as being either an agent or a patient in the utterances where it appeared. Then, we conducted a gist and a metaphor analysis and obtained a preliminary sketch of a CM of Nature. As a first verification stage of the findings, we conducted a reasoning analysis.

Finally, as a second and final verification of the CM found, we conducted a consensus analysis by constructing a questionnaire from the results of the previous linguistic analyses. We did not use any free listing tasks or sorting tasks to collect data and run consensus analyses on their results. We thought that the interviews had provided enough insights to make those two other data collection activities not necessary. The results of all the analyses confirmed the major characteristics of the American CM of Nature suggested by KBH. However, important nuanced differences emerged. Thus, the protocol implemented found supporting evidence towards its validity.

In Search of a Cultural Model of Nature: Analyzing the Interviews.

The semi-structured interviews were about climate change because the subjects would be using their knowledge of what they thought Nature is in order to answer the questions. All the interviews (around 12 hours) were digitally recorded and later transferred to a computer. The transcriptions of the interviews followed, thus, making their content available for analysis.

The Key Words Analysis.

The first analysis conducted on the texts of the interviews was a key word analysis. All the words used regarding climate change and nature were counted. The frequency of the top 20 key words was as follows: Human/s 98; Earth 74; Natural/Unnatural 72; Effect/Affect 67; Climate Change/Changing Climate 50; Good/Bad 38; Cause/s 38; Pollution/Pollutants 37; Plants/s/Greenery 32; Animal/s 31; Planet/ary 29; Atmosphere/Air 29; Im/balance 27; Climate (stand alone) 27; Life 25; Carbon/Dioxide/CO2 25; Warmer/Cooler 22; Species 22/ Fish 22; Amount 22.

After a close examination at the list obtained, we decided to look at the top 5 key words in more details. In fact, there appear to be a clear break in the frequency of these top 5 key words as compared to the frequencies of the following words. First and foremost, ‘humans’ is the word most frequently mentioned (98 times). At some distance, ‘earth’ follows as second (74), then ‘natural’ (72), ‘causal’ relationships (see the frequency of ‘effect/affect’) between humans and ‘earth/nature’ (67), and finally ‘climate change’ (50) which was the actual topic of the interview, thus expected to be highly frequent—notice, however, how the topic of the interview appears almost half as frequent as ‘humans’ in the texts.

While it is still too early to construct a narrative about a CM of Nature out of the sheer frequency of these few key words, it is clear that ‘humans’ stand out as the dominant actor (mentioned more often) in the interactions with ‘earth/nature.’ In addition, these relationships are conceived as ‘causal’ in either direction, humans to earth/nature or earth/nature to humans.

Semantic Roles (Agent vs. Patient) Analysis.

The high frequency of the key word ‘humans’ cued us toward an investigation of its semantic role in the utterances in which it appeared. That is, while it is already important to know that humans is the most frequent word, it is also relevant to know if it is being used as ‘agent’ or ‘patient’ in the events described. The answer to this question can also clarify the directionality of the causality relationship between humans and earth/nature.

The results of the analysis clearly indicate that ‘humans’ occur predominantly as ‘agent’ (83.80%) in the utterances in which it is used. Humans are then conceived—and linguistically encoded as such—as the primary agent in the relationship between them and nature. It can also be deduced that causal relationships are originated in humans and directed at nature. This

preliminary finding was implicit in the KBH’s CM of Nature. However, our analysis made it very explicit and it also highlighted its salient status for the population investigated.

The Gist analysis.

One analysis suggested and used by D’Andrade (2005) in order to arrive at cultural models held by the interviewees is that of reducing the texts of the interviews into gist sentences. This procedure yields a good indication about the cultural model/s that the population in focus holds about a specific domain of knowledge. The success of this procedure in his and other research projects convinced us to conduct this type of analysis. Consequently, the texts of the interviews were analyzed a third time and reduced to a number of gist sentences. We stayed as close as possible to the words and phrases used by the interviewees. A number of types of gist sentences were found and we recorded their frequency.

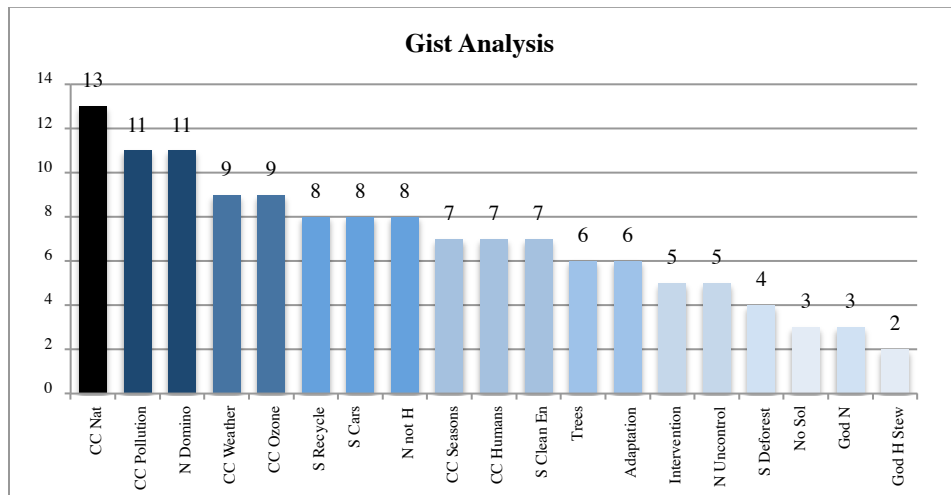


Figure 1: Gist Analysis.⁴

In Figure 1, we present the first results of this analysis. The gist sentences span a number of themes, from statements about climate change—e.g., climate change is caused by pollution;

⁴ Key to abbreviations in Figure 2: CC = Climate Change; Nat = Natural; N = Nature; S = Solution; H = Human; En = Environment; Deforest = Deforestation; Sol = Solution; Stew = Steward

climate change is fluctuating seasonal changes—to what could be done about it—e.g., more clean energy; stop deforestation—and to what are the constitutive characteristics of nature—e.g., domino-effect, uncontrollable. Then, after this careful reading of the results, we decided to divide the various gist sentences into three thematically arranged groups: one about the causes of climate change (56 statements), one about suggestions towards a resolution of problems caused by climate change (47 statements), and one about characteristics of Nature (29 statements).

The results about the suggested causes of climate change are the following: The majority of explanations (29/56) attribute climate change to ‘natural’ causes, that is, ice ages (13/56), weather (9/56), and seasons (7/56); the remaining explanations attribute it to pollution (11/56), the ozone layer (9/56), and finally and explicitly to human actions (7/56). The same poor understanding of climate change⁵ and erroneous attribution of the processes that causes it were found two decades ago by KBH (p. 214) in a stratified sample of the American population.

The types of solutions suggested reflect the explicitly mentioned or implicitly assumed causes of climate change. The suggestions are divided between measures advocating ‘intervention’ (18/47,⁶ or 38%), e.g., the investing in clean energy (7/47) or stop cutting trees (6/47), and measures advocating ‘adaptation’ (22/47, or 46%), e.g., recycling (8/47) and the redesigning of cars (8/47). Advocating adaptation has a significant higher frequency (46% vs. 38%).

The CM of Nature that the subjects seem to entertain while thinking about climate change is made of five major elements:

⁵ For a comparison between the causes of ‘ozone depletion’ and those of ‘global warming/climate change’ see KBH, pp. 28-38.

⁶ 3 responses did not fit any of the two categories indicated, that is, they stated that there was ‘no solution.’

- The constitutive parts of nature are all related such that if you change one part, a domino effect ensues that changes other parts (11/29);
- Nature was not made by humans (8/29);
- Nature cannot be controlled by humans and it is unpredictable (5/29);
- Nature was made by God (3/29);
- God created nature for humans and they can use it as they please but must also take care of it (2/29).

None of these characteristics of Nature lead to a consideration of humans and nature as being one, i.e., a holistic approach. They all presuppose a strict division between humans and nature while at the same time considering nature's fundamental characteristics as highly unknowable and basically of divine origin. Here again, parts of the suggested CM of Nature found in KBH is replicated in large strokes. In particular, some of the content of part 1 (Nature as a Limited Resource: Stewardship) and part 2 (Nature as Balanced and Interdependent: Domino effect; Unpredictability) of KBH's suggested CM is made explicit. However, what is highlighted by our analysis is the relevance of the separation between humans and nature as well as the essential role played by God in the creation of the latter.

The Metaphor Analysis.

Quinn (1987, 1997 [with C. Strauss], 2005b) has convincingly shown how an analysis of the metaphors used by subjects during interviews can provide relevant insights into the content and structure of their CMs. We decided then to conduct a metaphor analysis on the texts of the interviews. We expected from the analysis that the type/s of metaphors used would help us understand further how Nature and the environment are conceptualized.

The types of metaphors we looked for are those contained in the typology suggested by Lackoff and Johnson (1980): *Structural*; *Ontological*; *Container*; *Orientalional*; *Personification*. We found 161 metaphors. However, many were repeated, thus, the total for types of metaphor is 37, with each type occurring as follows: Structural, 7 types out of 22; Ontological, 11 types out of 32; Container, 5 types out of 17; Orientalional, 6 types out of 55; Personification, 8 types out of 35.

We provide below examples of the metaphors we found and group them under each of those types:

- *Structural Metaphors*:
Nature is a Theatrical Play; Nature is a Game; Nature is a Chain; Nature is a Karmic Cycle; Nature is a Sliding Scale; The Modern Era is a Hunt; Earth is a Greenhouse.
- *Ontological Metaphors*:
Earth is a Stage; Time is a Place (a Locus on a Line); Pollution is a Vehicle; The Ideal Balance (between nature and humanity) is a Place; The Man-Made World is a Machine; Nature is a Machine; Green is Purity; Earth is Glass; Climate Change is a Pendulum; Climate Change is a Space; Industry is Money.
- *Container Metaphors*:
Nature is a Space Separate from Humanity; Americans Occupy a Space Different from other Humans; Earth is not a Whole; Nature is Divided into Discrete Parts; Nature is a Circular Container; Time is a Container.
- *Orientalional Metaphors*:
Up, On, In and Forward indicate Desirable Outcomes; Down, Off, Outside and Backward indicate Undesirable Outcomes; Climate Change and Pollution Reverse the Established Directions (as stated above); Individuals Interviewed Perceived themselves as Separate from the Inside/Outside Framework (as stated above); Humanity is Inside the Inside/Outside Framework; Nature is a Container and is also Inside the Inside/Outside Framework.
- *Personification*:
Earth is a Person; Nature is a Person; Factories are People; Industries are People; The Atmosphere is a Person; Crops are People; Fields are People.

The results of this analysis indicate that our subjects view humans and the environment/nature in the following ways:

Humans are active agents.

E.g., Factories are People; Industries are People; Pollution is a Vehicle Driven by Humans.

The environment/nature is made up of interdependent and balanced units.

E.g., Earth is not a Whole (it is divided into discrete parts); Nature is a Circular Container;

Nature is a Space separate from Humanity.

Humanity is a discrete segment, but linked to the environment/nature.

E.g., Nature is a Theatrical Play; Nature is a Game; Nature is a Chain.

The First Sketch of the CM of Nature Obtained. From the results of the four analyses (key words, semantic role, gist, and metaphor) conducted on the interviews we can evince the following content for the CM of Nature that Northern Illinois subjects hold:

- They think/talk about nature with their primary focus on humans—and consequently ego;
- They think of humans as separate from nature;
- They think of nature as divine, discretely subdivided, and difficult to know.

Checking the American CM of Nature: The Verification Stage.

While the content of this American CM of Nature is sketchy and still provisional, we thought it appropriate to use further strategies to verify the appropriateness of its existence and the correctness of its temporary content (see Bennardo and DeMunck, 2014: 68; D’Andrade, 2005: 87; Quinn, 2005: 60).

The Reasoning Analysis.

The first type of verification we conducted is a “reasoning analysis” in line with Quinn’s experiences and suggestion (2005b: 61). This analysis consists of looking for reasoning passages in the texts of the interviews, either complete reasoning examples or just fragments. The intent

being that of verifying that the reasoning examples found/produced implied the use of the content of the CM of Nature hypothesized.

The results of the reasoning analysis pointed to the following features of the CM of Nature used during the interviews (we provide an illustrative example⁷ after the indicated feature):

- 1) Humans are separate from nature

“Reason that we are a distinctly different from the ‘natural world’ is- is because we’ve had a history.” (From AH transcript, p. 3)

- 2) Nature is a gift from God to humans

“But the word natural is associated with nature and, therefore, climate is of nature, and the author of nature, being a religious person, is Go:d, so there is there is a natural movement to the Earth as our Author created it.” (From MN transcript, p. 1)

- 3) If nature is a gift from God to humans, then humans can:

- a) Utilize nature to meet their needs;

“Uhm, but eventually, I mean, if they keep cutting down forests and stuff like that, I mean, we’re not going to have what we need.” (From SO transcript, p. 4)

- b) Be stewards of nature; or

“We do have to be good stewards of the Earth, and, you know, I mean, to me, pumping chemicals all over the place are not helpful.” (From MN transcript, p. 2)

- c) Not interfere with nature.

“When you have a- a healthy species that we: do destroy: for, you know, these sorts of ends, like whales being hunted down for oil, in that case, and- and in that- in that situation, then yes, that- that’s unfortunate.” (From AH transcript, p. 3)

These features of the CM of Nature used by the interviewees and highlighted by the reasoning analysis support the hypothesis advanced about the content of the American CM of Nature as evinced from the first linguistic analyses. In fact, the features point to an egocentric (focus on

⁷ As conventional in linguistics, in the transcriptions, the elongated pronunciation of some sounds (vowels or consonants) is indicated by a following semicolon.

humans/ego) CM of Nature in which humans are separated from, but related to nature. At the same time, nature is of divine origin and can be used to satisfy humans' needs or be stewarded. Often, nature is thought of not completely knowable, thus being unpredictable. All of these features had been indicated as the major content of the American CM of Nature hypothesized.

The Consensus Analysis.

Not satisfied with the results of the first verification analysis, we asked if the content of the CM of Nature we had indicated would be shared within the community investigated. Thus, we planned and executed a second type of verification that consists of a 'consensus analysis' (Romney et al. 1986; Weller, 2007; Borgatti and Halgin, 2011). The most relevant idea behind it is that if the content of the proposed CM were correct, the community would share that content in a significant way, thus we expected to find high consensus.

One of the standard methods in conducting a consensus analysis (see Bennardo and DeMunck, 2014) includes administering a questionnaire to a sample of the targeted community. We constructed our questionnaire by using the content of the suggested CM of Nature discovered. We were able to prepare 26 statements that reflected the content of the CM and about which we expected positive answers. However, the total amount of statements contained in the questionnaire is 52. In fact, we also added 26 more statements that negated the content of the CM (see Appendix) (Weller, 2007; Gatewood, 2012).

The statements were then scrambled randomly to ensure that each one of them was answered in isolation, rather than in relation to the preceding statement. Interviewees were asked to state their agreement with the statements according to five levels: Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree.

A survey sample of 52 people was constructed, based on the following parameters:

- Age (13/20s-10/30s-12/40s-12/50s-3/60s-2/70s)
- Gender (27 male and 25 female)
- Level of education (23 high school, 22 college, and 7 advanced degree).
- Location of residence (20 urban, 16 suburban, and 16 rural)
- Religion (24 present, 28 absent)

The results of the administration of the questionnaire were analyzed by using the Consensus Module of ANTHROPAC (Borgatti, 1992). Each questionnaire was transformed into ANTHROPAC format (example: 1F30PsR-HS = Respondent #1, Female, Age: 30, Place: suburban, Religions: none, Education: High school) and then fed to the application.

Consensus analysis is a form of factor analysis using the minimal residuals method without rotation in order to find inter-correlations among the cases (or informants) rather than the variables. An eigenvalue is a measure of that inter-correlation. The higher the eigenvalue, the greater it serves as a substitute for the underlying factor that accounts for the responses across informants. The idea behind consensus analysis is to find the degree to which a sample shares the same responses (a marker for “understanding”) regarding questions about a cultural domain such as, in this instance, a CM of Nature. Romney, Batchelder and Weller (1986), theorized that high agreement or inter-correlation among informants on an array of questions entails that they share the same cultural knowledge regarding the cultural domain.

By convention, high agreement or culture can be claimed for the sample when the eigenvalue ratio of the first factor (a measure of the factors power to explain variation across all cases or variables) is a minimum of three times greater than the eigenvalue of the second largest

factor. In this sense the eigenvalue ratio of 3:1 functions in the same way as .05 does to determine significance.

The first run of the software yielded results suggesting the possibility of what Caulkins (2004) has referred to as two “proto-cultures.” That is, factor one (or one pattern of responses by a subsample) accounts for 58% of the responses and factor two accounts for 34.1%, with an eigenvalue ratio of 1.7: 1 between the first (11.273) and second (6.581) factor. The ratio is significantly lower than the 3:1 ratio required to claim that the informants share a common culture.

With regard to using consensus analysis Caulkins writes that, “Typically in cases of proto-culture, variance explained by the first factor ranges between 50% and 59%” (2004: p. 320). By proto-culture he means that there is “weak agreement among informants suggestive of either the decline or rise of a stronger cultural agreement” (ib.: p. 326). However, we thought the difference might well be a matter of emphasis, so that those who indicated “strongly agree” and “agree” basically agree and contrast with the “disagree” and “strongly disagree” respondents. In fact, measuring on such gradient difference within agreement or disagreement might have masked a basic underlying agreement on people’s understanding and beliefs about nature. Hence we decided to collapse categories one and two (“strongly agree” and “agree”) as well as categories four and five (“strongly disagree” and “disagree”) and see what the results would yield.

The second consensus analysis showed a remarkably higher degree of consensus among the survey respondents. The eigenvalue ratio of the first (24.417) to second (2.303) factor was roughly 10:1, and factor 1 accounted for 85.4% of the variance among informants in their responses. This indicates a single CM of Nature being present in Northern Illinois, but with some

variation in the strength of either their agreement or disagreement on the various features of the CM. Thus, we can state with confidence that there is high agreement among our informants about the way the various components of Nature are related to each other, in other words, that they share the CM of Nature yielded by the analyses of the linguistic data.

Conclusion.

The results of this study in North Eastern Illinois fundamentally confirmed the two decades old findings of the research conducted by KBH in a larger sample of the American population.

Critical features of the CM of Nature held by Americans were all found again in the sample of the smaller North Eastern Illinois population. Humans are the focus of most of their thinking and reasoning about nature. In addition, humans are essentially separate from nature. This latter is divine in nature and with uncontrollable characteristics many of which are still unknown and maybe unknowable to humans.

We don't want to speculate about the reasons that are contributing to the major finding of this study, i.e., lack of change in knowledge about the causes of climate change, limited knowledge about the impact of climate change, and heavy participation of the divine in the conceptualization of nature. We want to point out though, how the overall results of the study add an important novel possibility to the research about CMs, that is, an innovative blended methodological trajectory as suggested by Bennardo and De Munck (2014).

The methodology implemented in this study has successfully tested that proposal. The results are highly comparable to another longer and more ambitious study (KBH's), and we consider the results a direct consequence of the methodology employed. It is this latter that makes the results sounder and more reliable. Our blend of linguistic analyses and quantitative analyses, including consensus analysis, adds a transparency to the various analytical stages that

was not present in KBH. In fact, while KBH also used open and semi-structured interviews to start their project, they soon proceeded to transform selected parts of those interviews into questionnaires for consensus analysis. They did not provide any explicit procedure that guided their linguistic selection.

We instead relied heavily—during the first phases of the project—on accurate and clearly specified linguistic analyses—well-established procedures in the available literature—to construct a likely hypothesis about a CM. The content of this latter gave us later the opportunity to construct a balanced questionnaire for consensus analysis. We also considered the two stages, linguistic analyses and quantitative analyses, as complementary to each other. The first as a discovery stage, the second as a validation stage, thus, putting us in line with another D’Andrade’s suggestion (2005: 85). Neither provides a ‘better’ insight, but the use of both elevates the chances of getting closer to what is the mental phenomenon we call a CM in the mind of the members of our targeted community.

Finally, and looking back at the content of the suggested methodological trajectory by Bennardo and De Munck (2014) that we introduced in the “Blending Two Methodological Approaches” Section above, we did not use all the data collection and data analyses procedures they recommend. However, we feel entitled to state that we have implemented a methodological spirit that is very close to their suggestion. In addition, we feel that our project and its results establish a first supportive experience that answers their plea.

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Appendix

Consensus Survey

Key:

5: Strongly agree 4: Agree 3: No opinion 2: Disagree 1: Strongly disagree

1. Humans are separate from nature	5	4	3	2	1
2. Humans affect Nature	5	4	3	2	1
3. Humans are unaffected by natural phenomena	5	4	3	2	1
4. Nature is a gift from God to humans	5	4	3	2	1
5. It is not the responsibility of humans to take care of nature	5	4	3	2	1
6. Humans are not responsible for climate change	5	4	3	2	1
7. Nature consists of unrelated parts that do not affect each other	5	4	3	2	1
8. Humans know very well how nature works	5	4	3	2	1
9. Nature consists of animals, plants, weather, and the physical environment	5	4	3	2	1
10. Nature affects humans	5	4	3	2	1
11. Some human activities have no effect on Nature	5	4	3	2	1
12. Natural phenomena are a manifestation of God	5	4	3	2	1
13. Humans do not have a right to use nature for their sustainment	5	4	3	2	1
14. Climate change does not exist	5	4	3	2	1
15. Nature is completely known	5	4	3	2	1
16. Humans can improve natural processes	5	4	3	2	1
17. Natural phenomena are not the result of human activity	5	4	3	2	1
18. Human activities can hurt nature	5	4	3	2	1
19. Humans should leave natural environments unchanged	5	4	3	2	1
20. Humans have to take care of nature	5	4	3	2	1
21. Humans can use nature while preserving it responsibly	5	4	3	2	1
22. Nature is complex	5	4	3	2	1
23. Nature is easily knowable	5	4	3	2	1
24. Humans can fully predict the consequences of interfering with nature	5	4	3	2	1
25. Nature can hurt humans	5	4	3	2	1
26. Humans should preserve nature for future generations	5	4	3	2	1
27. Humans are entitled to use nature for their sustainment	5	4	3	2	1
28. Human activity has had an effect on the climate	5	4	3	2	1
29. Nature is made up of connected systems and parts	5	4	3	2	1
30. Humans cannot understand fully how nature works	5	4	3	2	1
31. Natural processes are always positive for humans	5	4	3	2	1
32. Humans and nature are one	5	4	3	2	1
33. Nature and humans are separate	5	4	3	2	1
34. Some activities good for humans may interfere with nature	5	4	3	2	1
35. Humans can use nature for their needs	5	4	3	2	1
36. Climate change exists	5	4	3	2	1
37. Nature is not completely known	5	4	3	2	1
38. Humans should not interfere with natural processes	5	4	3	2	1
39. God, humans, and nature are all part of the same whole	5	4	3	2	1
40. Human and nature do not interact	5	4	3	2	1
41. It is not possible for humans to exist without affecting nature	5	4	3	2	1

42. Nature is not a gift from God to humans	5	4	3	2	1
43. Climate change's effects exist	5	4	3	2	1
44. Nature is not completely knowable	5	4	3	2	1
45. Changing parts of nature may have unexpected consequences	5	4	3	2	1
46. Some natural phenomena are the result of human activity	5	4	3	2	1
47. Natural phenomena are unaffected by human activity	5	4	3	2	1
48. Some human activities will change nature for ever	5	4	3	2	1
49. God is not manifested in nature	5	4	3	2	1
50. Climate change is a natural/cyclical phenomenon	5	4	3	2	1
51. Nature is simple	5	4	3	2	1
52. Nature may create negative circumstances for humans	5	4	3	2	1