

## Computing Reincarnation Beliefs Across Cultures

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### Abstract

Although cultural data has been collected for as long as 130 years, the use of that data for *cross-cultural* investigation was limited and lacked methodological credibility. The data were not collected with the idea of being used in strictly comparable ways, trends and theories changed over time, and data elements were often missing. The computational methods developed by [Dow and Eff](#), along with a new standardized ethnographic atlas now allow for comparison of data gathered over time and across cultures with a reasonable expectation of comparability. We chose to use the cultural variable of reincarnation beliefs to put the methods to the test. Despite having a smaller than recommended set of cultures showing this belief (58 in the original data set of 186), there was significant clustering. This led us to expand the data set with supplemental coding of cases and to identify variables that co-occur significantly with reincarnation beliefs.

### Introduction

New methods of computation allow us to make cross-cultural comparisons that previously eluded credible analysis for several reasons:

- Missing data
- Different coding systems
- Changes in fields of inquiry over time

*Missing data.* Because anthropology is the study of cultures normally conducted on site, in depth and for extended periods, not every field study gathers the same data. Although there are somewhat standard field methods, not everything will appear salient to every researcher in the context of what they experience in the setting. In addition there is so much environmental variation that the naturally occurring differences make it easy to avoid a checklist approach.

*Different coding systems.* Although anthropology is a field science like biology, it lacks the unifying base of phylogenetic taxonomies to structure the patterns of coded data. Different schools and theories may emphasize different kinds of variables, and the approach is more social ecology driven than classification driven, on the whole.

*Changes in field inquiry.* Early anthropologists came out of enlightenment philosophy with its cataloguing of material characteristics, out of colonial rule and its needs, and out of default Christian societies. Although early anthropologists had to be both highly rational and highly adaptive to last in the field, these basic frameworks affected what they took seriously about the cultures they studied. Studies consisted of lengthy immersion in cultures, and the ability to survive for periods of a year or more as guests of the studied culture in situ. Under the circumstances, it is natural that they would credit their own observations. While it is hard to overlook aspects of material culture that are there for all to see, it

is possible to neglect or dismiss aspects of belief in favor of more material variables or family-oriented systems. So, for instance, Amerindian cultures were not reported early on to have reincarnation beliefs, whereas later studies revealed them to be widespread, even after centuries of Christianization.

Dow and Eff have developed a methodology that allows calculation in spite of these gaps in data, and that doesn't rely on broad characterizations we find in popular work like Hofstede's psycho-cultural typologies. These new methods of computation allow us to study cross-cultural variables that previously eluded credible analysis due to missing data, different coding schemes and changes in field inquiry over time. Earlier ethnographers, although they may have argued among themselves on theories of social organization, tended to credit certain default methods and **theoretical** perspectives in the discipline.

### **The problem of cross-cultural intersubjectivity**

Beginning in the 60s, the combination of some highly public disputes (Redfield-Lewis' time-separated studies of Tepoztlan, and the Mead-Freeman debate, where subsequent observers questioned the sunnier view of the earlier anthropologist) and the introduction of phenomenological and Marxist theories resulted in less certainty about the "accuracy" of field methods. While it is possible to document with certainty aspects of material culture like crops, hunting, tools, building materials, migration, ecology and even kinship structures, other domains are murkier. Once the investigation ventures into the world of beliefs, the filter of the ethnographer's own culture along with how informants filter their own culture for the ethnographer can leave some topics uncovered or misrepresented. Intersubjectivity between cultures and individuals creates safe grounds for dialogue but not necessarily complete ones. Reported supernatural incidents (e.g., rebirths) or beliefs may be treated as metaphor, for instance. And some things are just off the chart of possibility. The Andean/Quechua *pishtaco*, a tall white bearded blue-eyed man who haunts the lonely trails to capture people and take oil from their liver to lubricate his machinery might be seen as a valid metaphor for colonialism, while the reports of a cave in the Andes where aliens have landed is seen as pure fabrication. These things just aren't possible in a Western worldview, so can't be treated as "fact". This affects how they are studied.

Given this kind of ontological preference, it is easy to see how early ethnographers, many being de facto Christians, might not inquire thoroughly into reincarnation beliefs, or for the same reason, informants might not want to report them. They would be sidelined into folklore or not even collected. So it turned out to be the case with reincarnation beliefs, which were rarely reported, but then in subsequent ethnographies and database reports, turn out to be widespread (between 22% and 30% of cultures have some form of this belief). Early codings of reincarnation beliefs (Rosenblatt, Walsh and Jackson 1976) showed a single digit percentage of societies having them. These are spread over the globe, but there turns out to be an interesting distribution that suggests early proto-reincarnation beliefs in Northern Asia, possibly the Siberian area, that predate the Vedas () and are shared incidentally in the areas settled by the migrators across the Bering Strait in their various waves. The fact that they predate the Vedas, where they then grew into codified beliefs with an ethical component (karma), explains the more animistic, natural recycling and ethically unfreighted beliefs of Amerindians in the sub Arctic and Pacific Northwest. Not to belabor, but by the time this belief reached the Andes, it was not a recycling of souls

but the persistence of a soul or consciousness in the mummified remains of rulers. (Assuming it really did travel down the coast as we envision.)

Once investigators became both more phenomenological, *i.e.* more truly relativistic and less committed to the primacy of their own worldviews, and were also themselves from non-Western cultures (e.g., Obeyesekere and many others), the scope of inquiry into such beliefs gained both breadth and depth. So, more cultures were discovered to have reincarnation beliefs. Revisited cultures turned out to have them where previously there was no record, and the description became deeper. Paradoxically, since there is a tension between phenomenology and science as we know it, the mathematical methods also allow deeper inquiry, since these provided the ability to compare variable clusters associated with reincarnation beliefs.

In this paper we begin to outline what we have learned so far in choosing reincarnation beliefs as a variable to calculate as to its predictors in the cross-cultural data sets. To revisit the motivation, the combination of a new encyclopedic compilation of cross-cultural data sets (the Standard Cross-Cultural Sample, and Ethnographic Atlas for example), along with much stronger methods of analysis that can deal with the forenamed problems of this kind of data (missing data, different coding systems and changes over time in field inquiry) lead to new possibilities for analysis. White was chartered by Wiley to edit a book by diverse authors (the Wiley-Blackwell Companion to Cross-Cultural Research) invited to use these methods on a series of questions. We chose reincarnation beliefs as a variable to explore partly because it seemed the most exotic and the least computable. At the beginning, there were 58 cases in the Encyclopedia, technically too thinly and unevenly scattered to yield meaningful results. But a first run turned up non-random correlations. White then found other cases, adding up to a total of over 70. We also reviewed literature revisiting specifically Amerindian beliefs and the origins of reincarnation beliefs in Vedic and Buddhist sources.

### **Previous Literature**

Obeyesekere (2002) has written a detailed treatise analyzing types of reincarnation beliefs; we will try to work with these types in a future paper. Among the key distinctions are whether rebirths are merit-based or just part of a natural cycle, whether the person is born within a lineage as many Amerindian beliefs hold, whether always born as humans or also into animals and whether there is a direction to the rebirths (if born as an animal can one come back as human, how difficult, etc?) In the Vedic and Buddhist philosophies, now codified religious beliefs, reincarnation as an animal is seen as unfortunate and earned through bad deeds, whereas Amerindian beliefs don't make a distinction in the merit of being born as an animal or as a human. There is much fascinating detail to the variety of beliefs, needless to say.

Sociologist Guy Swanson (1960:109-120) did an early cross-cultural study, anticipating from Durkheim's theory of projection from primordial social order that "reincarnation is likely to appear where the pattern of settlement is by small hamlets, compounds of extended families, small nomadic bands, scattered rural neighborhoods, or other units smaller than a village" (p113-114). Twelve of his

ethnographic cases had transmigration to animals while only one society in his fully-coded sample of 50 (2%) had reincarnation to human form.

Rosenblatt, Walsh and Jackson (1976) coded reincarnation (their variable 85) as a matter of degree for 78 societies on a scale of 0 (none) to 4 (strong) without further distinctions, with the following frequencies: 4 n=9; 3 n=4; 2 n=8; 1 n=3; 0 n=37; missing data n=17; with 11/61 or 18% coded 3 or 4, significantly higher than Swanton's 2%. Levinson (1994) indexed the topic of reincarnation (encompassing transmigration) in his tenth Encyclopedia volume of roughly 1500 World Cultures, listing 98 societies (perhaps 30% given missing data). His summaries of Death and Afterlife for those entries, and the data of Rosenblatt et al., suggest that 25% of these cases involved reincarnation. Ten of the 98 were North American Indian. Obeyesekere (1994, 2004) and Mills and Slobodin (1994) made a comprehensive world survey of 203 societies with beliefs in reincarnation as humans and/or animals with circa 180 as humans, out of a set of circa 600 societies worldwide (circa 30% reincarnation as humans) judging from 55 pages of ethnographic bibliography (Matlock and Mills 1994). Of these, circa 150 were Amerindians North of the Mexican border, perhaps 25% of the world sample. Of the world sample indexed in Mills and Slobodin (1994:see Culture Index), 25 or 13% were in the 186-society Standard Cross-Cultural Sample. Many SCCS societies (Murdock and White 1969, 2008; White 2007) with reincarnation as humans were not indexed, however. Rosenblatt et al.'s codes include 53 SCCS societies, of which 12 or 23% attest reincarnation as humans (3,4). Adding these to the those indexed by Levinson (1994), or reported by Obeyesekere (1994) and other chapter authors in Mills and Slobodin (1994) and also Obeyesekere (2002), the number of societies coded as reincarnation (3,4) is 41/79=52%, a good number of which are "reports" mentioned in one of the 16 multi-authored chapters of Mills and Slobodin (1994). Some of the latter are based on a single informant (e.g., Thompson 1916), bringing an SCCS world distribution closer to 33%. The correlation between Rosenblatt's and other reincarnation codes for 52 societies is  $R^2 = .50$  with a significance value=0.000000004. The conclusion of our survey of coded cross-cultural data on worldwide ethnographic descriptions of beliefs in reincarnation as humans (codes 3,4) is an approximate 30% or less, with considerably higher density among Northern Amerindians. From the Gilyak/Yukaghir/Chukchee societies 119-121 in SCCS proximity order in Eurasia to Natchez (SCCS 146) in Southeastern North America, 71% of the societies are classified as "4" for beliefs in reincarnation as humans. Mills and Slobodin's (1994) Trait Index to North American Indian and Inuit Reincarnation has a clearly documented exposition of how all three major migrations – Amerindian, Na-Dene, and Eskimo-Aleut – from the Bering Straits into the Americas were richly endowed with beliefs in reincarnation of reborn souls into the bodies of their descendants.

table(sccsA\$reincarnation) #no additional cases other than Rosenblatt et al. (1976)

|  | 0  | 1 | 2 | 3 | 4 |      |
|--|----|---|---|---|---|------|
|  | 33 | 2 | 6 | 3 | 9 | n=53 |

table(sccsA\$reincarnation) #extra cases from Levinson (1994), Mills-Slobodin

|  | 0  | 1 | 2  | 3  | 4  |   |
|--|----|---|----|----|----|---|
|  | 26 | 2 | 11 | 11 | 30 | n=79 there are 27 additional cases beyond those of Rosenblatt |

These cultural patterns comport with Swanson's assertion that reincarnation follows within families or lineages (although his cases showed a 12:1 ratio of transmigration:reincarnation), as was argued by

Durkheim's student, Mauss (Slobodin 1994). "Among Indologists it is generally accepted that the doctrine of rebirth goes back in India 'to prehistoric times; it was then taken up in Brahmanic religion and appears as a new doctrine in the Upanishads' .... However, in Brahmanic and then in Buddhist and Jain belief it had undergone a crucial change. The succession of rebirths is no longer a desideratum. Rather, it represents a fate from which the individual identity must strive to escape" (p293). "[T]o Native North Americans, reincarnation is an expansion of continuity, of survival, and of what Edith Turner calls 'connectedness.' "... the goal of life is not getting out of the cycle of rebirths ... or gaining entrance to heaven and hell.... Rather, groups [such as Gitksan ... and Beaver] expect people to be reborn, bringing back traits they manifested in previous lives or occasionally manifesting traits ... desired to embody in subsequent life."

### **Dow-Eff functions as an approach to Cross-Cultural Research**

Editors of the Wiley Companion to Cross-Cultural Research recently invited researchers to use a statistical methodology newly created by Eff and Dow (2009) and enhanced by the Wiley CCCR editors for dealing with missing data and Galton's problem of the nonindependence of cases. Like any other culturally observed (e.g., ethnographically described) variable, beliefs in rebirth (reincarnation and transmigration of souls) sampled in a regional or world survey, if these phenomena are to be studied statistically, it will require analysis with the inferential statistical power **of** the Dow-Eff functions (DEf: Dow and Eff 2009, 2013; Eff and Dow 2009). The lack of valid inferential methods has plagued anthropology for the last 130 years and has only advanced very narrowly for problems of analyzing samples of observational data in other social and natural science disciplines. The Dow-Eff functions are similar to other R packages for regression in some respects but include controls for autocorrelation using a fast, efficient, and statistically well-tuned two-stage least squares (2sls) approach. It includes a standard R package for multiple imputation or MI (based on Rubin 1987) of missing data: *mice* by van Buuren and Groothuis-Oudshoorn (2009). MI via *mice* requires a sizeable set of completely coded variables available and analyzed into principal components that measure different systemic aspects of multivariate structure in the dataset from which MI is done probabilistically.

DEf also provides a network lag solution to "Galton's problem" of variables that are nonindependent due to network interactions between the observations, i.e., nonindependence among cases. Network lag solutions to estimating autocorrelation effects require appropriate network data: geographic, linguistic, transport, political or religious contiguity. Because in the "2sls" approach the iid assumption is essential to interpreting regression results, and Hausman significance tests for the exogeneity are used for each independent variable, models can be discovered that have reliable predictions that are not confounded by nonindependence of cases. Nonindependence does not necessarily bias the magnitude of correlations or regression results but may massively alter the variance of estimates. Regression models are meaningless without controls for nonindependence of cases in samples of observations.

For the time being, we present below the clustering we derived.

*For all cases.* Here almost all the variables are three star (significant at  $pvalue < 0.001$ ): predictors of classical reincarnation at probability 1/1000. The predictors are wet climate, matrilineality combined

with husbands assist wives with infants, high degree of political integration, low rainfall, cultivation not intense, and low frequency of domesticated animals.

**Table 1:** Predictors of Preclassical and Classical Reincarnation-the total sample

| .DepVar_v1998 for Reincarnation                   | - Classical Desc               | Coef R <sup>2</sup> =.45              | stdcoef | pvalue | star   | Hausman test exogenous |
|---|--------------------------------|---------------------------------------|---------|--------|--------|------------------------|
| (Intercept)                                       | NA                             | -0.759                                | NA      | 0.237  |        |                        |
| Wy R <sup>2</sup> =.96                            | NA                             | 1.441                                 | 0.485   | 0.000  | ***    | 0.240                  |
| bio.13= <b>Precipitation</b>                      | - of Wettest Month             | 0.003                                 | 0.244   | 0.000  | ***    | 0.733                  |
| matriR51sq  | <b>matriR51sq</b>              | 0.128                                 | 0.188   | 0.031  | **     | 0.578                  |
| v1253   | Leishmanias                    | 0.781                                 | 0.354   | 0.000  | ***    | 0.776                  |
| v1260=Total                                       | Pathogen Stress                | -0.153                                | -0.374  | 0.000  | ***    | 0.479                  |
| v157=Scale 9                                      | - <b>Political Integration</b> | 0.327                                 | 0.242   | 0.000  | ***    | 0.195                  |
| v1915= Lowest <b>Yearly Rainfall</b>              | cm in Years Sampled            | -0.006                                | -0.271  | 0.000  | ***    | 0.834                  |
| v232  | Intensity of Cultivation       | -0.165                                | -0.179  | 0.006  | ***    | 0.669                  |
| v815- Imptnc                                      | Domes. Anim                    | -0.022                                | -0.153  | 0.000  | ***    | 0.910                  |
| No VIFs > 2.8                                     |                                |                                       |         |        |        |                        |
| INSTRUMENT (1)                                    | <b>Matrilineal</b>             |                                       |         |        |        |                        |
| INSTRUMENT (2)                                    | (Evil Eye)                     | Slightly negative but not significant |         |        |        |                        |
| @ Dv1998.7#Results_1                              |                                |                                       | Fstat   | Df     | pvalue | Star                   |
| RESET test. H0: model has correct functional form |                                |                                       | 1.491   | 2111   | 0.222  |                        |
| Wald test. H0: appropriate variables dropped      |                                |                                       | 6.558   | 47     | 0.014  | ** (3)                 |
| Breusch-Pagan test. H0: residuals homoskedastic   |                                |                                       | 0.425   | 4492   | 0.515  |                        |
| Shapiro-Wilkes test. H0: residuals normal         |                                |                                       | 0.458   | 98     | 0.500  |                        |

(1) MatriR51sq combines matrilineality with decline in female care for infants that indexes father as a helper of mother with husband-wife equality (see Wiley Companion Ch. 5). There is no first-order correlation of Reincarnation with matrilineality (pvalue=0.682).

(2) Evil Eye v1188 is somewhat negatively correlated Reincarnation but not significantly, in contrast to results in Table 2.

(3) Variables dropped were synonymous with others included.

*For Classical Reincarnation.* (e.g., Hinduism, Buddhism – again mostly nonrandom at 1/1000 chance of randomness) are wet climate, road transport, high political integration, importance of the father (either patrilineal or bilateral descent). All societies in this subsample are coded “4” and all others “0” distinguish *classical reincarnation* (Buddhism, Hinduism and their synthesis) against all others as a maximum contrast.

**Table 2:** Classical Reincarnation-India-Khmer-Siam-Java-Bali-Korea vs. Others

| .DepVar_v1998 for Reincarnation   | - Classical Desc   | coef R <sup>2</sup> =.63 | stdcoef | pvalue | star | Hausman test exogenous |
|-----------------------------------|--------------------|--------------------------|---------|--------|------|------------------------|
| (Intercept)                       | NA                 | -2.098                   | NA      | 0.000  | ***  | NA                     |
| Wy R <sup>2</sup> =.99            | NA                 | 0.247                    | 0.181   | 0.013  | **   | 0.822                  |
| bio.13 = Min <b>Precipitation</b> | - of Wettest Month | 0.002                    | 0.261   | 0.000  | ***  | 0.812                  |
| v154 Scale 6                      | - Land Transport   | 0.443                    | 0.475   | 0.000  | ***  | 0.831                  |

|   |                                |        |        |         |        |         |
|---|--------------------------------|--------|--------|---------|--------|---------|
| v157 Scale 9  | <b>- Political Integration</b> | 0.300  | 0.309  | 0.000   | ***    | 0.626   |
| v991 <b>Fathers Important</b> for Both Boys & Girls | without Regard to Gender       | 0.139  | 0.201  | 0.035   | **     | 0.703   |
| No VIFs > 1.6                                       |                                |        |        |         |        |         |
| INSTRUMENT v1188 (1)                                | Evil Eye Score                 | -0.084 | -0.147 | 0.003   | ***    | 0.666   |
| INSTRUMENTS (2)                                     | <b>Patrilineal</b> Bilateral   |        |        |         |        |         |
| <b>@ Dv1998.4#Script_4_CLASSICAL</b>                |                                |        | Fstat  | Df      | pvalue | Star    |
| RESET test. H0: model has correct functional form   |                                |        | 12.84  | 143.09  | <.001  | *** (3) |
| Wald test. H0: appropriate variables dropped        |                                |        | -0.14  | 20.15   | 1      |         |
| Breusch-Pagan test. H0: residuals homoskedastic     |                                |        | 11.96  | 5691.56 | 0.001  | *** (4) |
| Shapiro-Wilkes test. H0: residuals normal           |                                |        | 0.33   | 2626.72 | 0.564  |         |

(1) Although belief in “evil eye” is antithetical to beliefs in rebirth, its absence neither causes or predicts the presence of beliefs in rebirth. The two are simply antithetical in meaning.

(2) All six SCCS societies with “classical” beliefs in reincarnation, i.e., the “great Traditions” such as Buddhism and Hinduism that originated in the Axial age and spread or syncretized more globally (the six named above) are either patrilineal or bilateral; three in number in both cases. These cases contrasted with others are highly correlated with beliefs in reincarnation with a p-value = 0.002456. They are non-significant in the model because, constituting 77% of SCCS societies, these features are so generic that they fail to compete with more narrowly defined features.

(3) The significance of this test indicates that a better model would involve a nonlinear transformation of one or more of the predictive variables, e.g., the square of v154, v157, etc.

(4) The significance of this test indicates heteroscedasticity, i.e., greater bunching or spreading of error terms than expected at random. The Def functions apply the Heteroscedasticity-consistent standard errors (HCSE) correction of the significance tests but do not affect the regression coefficients.

### **Dow-Eff Predictors: Comparing Models Controlling for Autocorrelation and Imputing Missing Data**

The predictors of Classical Reincarnation SCCS societies in Table 2 (India-Khmer-Siam-Java-Bali-Korea vs. Others) and those in Table 1 (all cases, including those of Table 2) are easy to interpret. There are four predictors, among which Political Integration (v157) and Precipitation occur as *shared* predictors in both Tables 1 and 2. The two striking *contrasts* are that the Table 2 societies have colder climates and Patrilineal/Bilateral kinship along with Fathers important in contrast to Matrilineality along with Husband-wife equality in Table 1 results. Bold elements show the contrastive elements in Tables 1 and 2 while Bold elements colored green highlight shared elements.

### **Conclusions**

The statistical study using Dow-Eff functions (Def1 for use in an R GUI) shows that the 53 SCCS societies coded in Rosenblatt’s study (1976) for the reincarnation variable could provide a valid basis for a cross-cultural study if it were demonstrated that the six world regions (cor = -0.1399743, p-value = 0.3175)

were well represented, which they are not. Combining datasets from different sources we have a higher number of SCCS societies in the sample, which provided more accurate results, including findings of the North America/Siberian connections as diffusion gradients. In general we were satisfied that **the** preliminary results in the Eff-Dow tables 1 and 2 allowed us to identify a few features that they had in common as well as the differences of the Vedic evolution of reincarnation beliefs in a statistically reliable way. This allows further investigation into the cultural origins of reincarnation beliefs.

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