

SCALE ANALYSIS AND THE ELABORATION OF MENSTRUAL TABOOS

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This study was originally undertaken to test some of William N. Stephens' psychosexual hypotheses on a continuous geographic area. In his 1962 book, THE OEDIPUS COMPLEX, Stephens sought to explain the Oedipus Complex as the result of the length of the post-partum sex taboo which resulted in castration anxiety and extensive menstrual taboos, among other things. Although many of Stephens' correlations were interesting for his world-wide data, when the data were sub-classified into individual geographic regions, the correlations tended to fluctuate. In order to test his hypotheses, we chose the Great Basin and Northern and Central California solely because the data seemed most complete.

We used the Culture Element Distribution lists gathered by Kroeber and his students from 1934 to 1938. (Some of the data for the Ute came from personal communication from Joseph G. Jorgenson.) Altogether data were collected for 100 tribes (or bands) on 22 variables, and after the first scales had been constructed an additional 41 tribes were scaled for the available data and mapped.

First a brief summary of the assumptions of scale analysis: According to most authors, the Guttman scale is designed to primarily show the relationship of attitudes and traits to an underlying variable. To quote Guttman:

Scaling analysis is a formal analysis and hence applies to any universe of qualitative data of any science, obtained by any matter of observation. (Guttman, 1944:142)

What is important to note in scaling, is that scaling is either inherent in the data or it is not there at all. Scaling is not an artificial manipulation of the data to obtain the desired results. In a perfect Guttman scale of ten traits, each

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trait will exhibit a systematic relationship with all of the other traits. If the traits are ordered from most prevalent to the least prevalent, and a number assigned to these traits from the most prevalent to the least prevalent (one through ten), then whenever trait #10 is recorded as being present in the scale, the nine other traits are also present; and when trait #9 is recorded as present in the scale, all of the other traits are present, except for #10. This is the familiar "step-like" appearance of this particular kind of scale.² This can also be described in terms of set theory in which the set of succeeding traits are contained in the previous ones. Scale errors occur when these assumptions do not hold for all of these relationships. There are two tests of the degree of scaling, the coefficient of reproducibility and the coefficient of scalability. We have used the latter in our study.

Stephens' original menstrual scale was subsequently revised by Young and Bacdayan in 1965. We initially utilized Young and Bacdayan's scale with some minor modifications of our own and later in the investigation we completely revised the Young and Bacdayan scale. Stephens had hypothesized that the length of the post-partum taboo was related to the extensiveness of menstrual taboos in its relation to the Oedipus Complex Syndrome: that is, the longer the post-partum taboo, the more extensive the menstrual taboos in terms of scale progression.

We were able to code for the length of the post-partum taboo for 62 tribes in our area: most of the data came from the Culture Element Distribution Series although a few were obtained from Murdock's ETHNOGRAPHIC ATLAS (1967). We tested the length of the post-partum taboo with the revised Young and Bacdayan scale for our area and a ϕ of 22.4 was obtained in the direction predicted by Stephens, that is, the longer the post-partum taboo, the more extensive the menstrual taboos. The ϕ association was then tested with the matched-pair history-function test originally devised by D'Andrade (Naroll and D'Andrade, 1963) and subsequently expanded by Driver (unpublished m.s., n.d.)

2. This relationship can also be expressed in terms of necessary and sufficient conditions. Any trait preceding another trait is a necessary condition for the latter and any trait succeeding is a sufficient condition.

The rationale for the history-function test is simply a comparison of the presence or absence of traits for matched pairs of tribes. With a correlation of two traits, there are 16 possible ways in which any two possible tribes can be paired: of these 16 possible ways, four discriminate between historical (or diffusional) relationships and functional relationships. As an example, if a tribe with both traits present is paired with a tribe with both traits absent, intra-tribe relationships give the hits for function and inter-tribe relationships give the hits for history. In this case, there would be two hits for function: that is a plusplus and a minusminus, and no wins for history because the inter-relationships are different: that is a plus with a minus and a plus with a minus. It is then possible to calculate the expected and observed pairs for history and function.

In testing Young and Bacdayan's revised five-item menstrual taboo scale and the duration of the post-partum taboo we utilized the 62 available tribes from our area. The tribes were divided into two culture areas (following Driver, 1961), The Great Basin and California (28 and 34 tribes respectively). The pairing was done on a probalistic basis. The expecteds were calculated first on the basis of the entire N (62) and then the correlations were sub-classified into the two culture areas. The sub-categories (28 and 34) were normed to a same N and the observed scores calculated on a probabalistic basis, without actually having to go through the difficulty of pairing them up. Given just two culture areas, this method proves to be the more exact one.

Subjecting the data to the history-function tests, the matched pairs of distant tribes showed that history was considerably below the expected in scores, indicating that function was predominant. This would appear to be a partial confirmation of Stephens' original hypothesis, namely that the duration of the post-partum taboo is associated directly with the extensiveness of menstrual taboos.

Unfortunately, Young and Bacdayan's modified five-item scale as applied to our geographical area doesn't give a very good coefficient of scalability. Its coefficient is .61, with the recommended minimum being between .60 and .65. (For their world-wide

data, however, they obtained a coefficient of scalability of .79. A perfect scale would have a coefficient of scalability of 1.00.) Because of this low coefficient of scalability for our particular area, we decided to look for a different scale. We eventually devised a ten-item scale which we believe to be unique, in that the last four items in the scale (numbers, or items 7,8,9, and 10) those which are the least prevalent, apply to restrictions on men during the menstrual period, a fact hitherto no mentioned in any of the literature which we have seen on the scaling of menstrual taboos. The actual ten-item scale which we devised is as follows:³

1 - meat taboo to menstruant	(0)	[0]	
2 - fish taboo to menstruant	(1)	[1]	
3 - menstruant avoids hunters	(2)	[2]	
4 - menstruant avoids sick	(12)	[12]	
5 - intercourse taboo	(15)	[15]	
6 - cooking meat for man, family, husband taboo	(13)	[22]	
7 - restrictions extended to husband	(5)	[8]	
8 - man cannot gamble	(15)	[15]	
9 - man cannot hunt	(12)	[24]	
10 - man cannot fish	(25)	[25]	

For the 100 tribes coded and scaled on ten traits, the coefficient of scalability was .78 with the unreported instances not included. (The unreported items for 1000 possible traits turned out to be 189 or 18.9%.)

D'Andrade and Driver's history-function test was then applied to our new ten-item scale and the duration of the post-partum taboo for the 62 coded available tribes. When a post-partum taboo of a year or longer is compared with a scale type of 9 and/or 8 (Items: man cannot hunt and/or gamble) the ϕ obtained was 34.1 and function again wins over history for the probabalistically matched pairs for the two culture areas, California and the Great Basin. However, when the most extensive scale item, #10 (the fishing taboo applied to men) was compared with the duration of a post-partum taboo of 2.5 months or less, a ϕ of 20.6 was obtained. (For this particular relationship on the probabalistic history-function test, function was again the winner over history.) Since, according to Stephens in 1962, the duration of the post-partum taboo is the triggering factor in the causal chain, culminating in the Oedipus Complex Syndrome, the last relationship obtained (the ϕ of 20.6) casts some

3. The following list contains the 100 tribes in () and the additional 41 added to the scale in / /.

additional doubts on his Oedipus Complex hypotheses, since the most extensive menstrual taboo on the scale is associated with the shortest recorded post-partum taboo. At present we are not able to explain this result.⁴

Turning back to Young and Bacdayan's five-item scale for their world-wide sample, we soon discovered that our own ten-item scale for a selected geographical area was germane to the problem that they were interested in: namely sociogenic versus psychogenic explanations of menstrual taboos. From a sociogenic perspective Young and Bacdayan hypothesized that menstrual taboos were actually an aspect of social rigidity and male dominance, and that menstrual taboos were probably a reflection of institutionalized discrimination against women in the society. In both Stephens' scale and Young and Bacdayan's scale, the variables pertained only to women, yet for our scale, it begins with taboos on the menstruant and is elaborated upon until restrictions of various sorts applicable to men dominate the top part of the scale.

Though we are only dealing with a limited geographic area and Young and Bacdayan were dealing with a world-wide sample, it is quite possible that some of the items that we found to be scalable might also be scalable on a world-wide basis, were the data available. Although we have yet to proceed to a world-wide sample, we did try and expand our ten-item scale outside of this area to the Northwest Coast and the Plateau area and we found that the scale was not applicable there. Although dealing with a limited geographic area, our investigations indicate that there may be some difficulties with scaling and scale analysis in general, particularly the problems of scales within scales and the data which is chosen to fit into a scale itself.

4. Even before our research began we had some doubts about Stephens' hypotheses. When his contingency coefficients were converted to ϕ s and put into a stochastic matrix for his world-wide sample, another variable could easily be hypothesized to be the triggering point of the Oedipus Complex Syndrome. In fact, another variable, "sex anxiety" was found to be the initiator (according to Stephens' own data) with post-partum taboo coming later. Needless to say, we do not believe this sex anxiety trigger to be necessarily a real one since the sex anxiety variable was actually a composite of several variables at once. (For the conversion of the coefficient of contingency C to ϕ :

$$\text{since } X^2 = N\phi^2 \quad \text{and } C = \sqrt{\frac{X^2}{N+X^2}} \quad \text{then } \phi = \sqrt{\frac{C^2}{1-C^2}}$$

where X^2 is "chi-square")

Aginsky, who worked on the Culture Element Distribution lists, pointed out in a 1956 paper that although the CED's were the best methodological advance to come along at the time, there were certain limitations inherent in quantification of raw cultural traits: simply, what traits do you count? He pointed out, that the traits were essentially chosen on a random sample basis and to his own mind, did not include enough items. Though approximately 3000 items (on the average) were obtained for each of the tribes in the CED's, Aginsky estimated that there were approximately 100,000 traits present in each of the units and apparently he would have liked to have had them included. 5

Scales may be able to give us a tentative picture of the relative ordering of traits, but when meaning is imputed to the correlations of scales with variables or or scales with scales, the problem becomes difficult. At present there seems no way to know if a scale is completely inclusive. Even assuming that an exhaustive scale is constructed, there are the problems of regional variation which have been discussed with the correlations of individual variables. A world-wide scale may in some cases be the intersecting set of all regional scales with the regional scales differing considerably. This may have been the case when we attempted to expand our own scale to the Northwest Coast and Plateau area.

We were also interested in investigating certain aspects of Guttman scaling that would be applicable to other scales. Several authors have seen scale analysis as a method of establishing diachronic sequences and functional relationships of variables from synchronic data. (See for example Carneiro, 1962 and Carneiro and Tobias, 1963.) As Tugby (1964) has pointed out, scale analysis is actually a more specific aspect of the inter-correlation matrix. Brainin and Robinson (1951), and Driver (1956) use the inter-correlation of ϕ to indicate temporal ordering from synchronic data. In converting our ten-item scale and Young and Bacdayan's revised five-item scale into inter-correlation matrices, we confirm the fact that the most general traits are

5. In his 1952 comment (pp. 263-65) to "Salt, Dogs, Tobacco" written in 1941, Kroeber pointed out how poorly the Culture Element Distribution Series were received by anthropologists.

followed by the others in the ordering reflected in the scale. Because a scale is a more specific aspect of the stochastic process, it does appear that the scale can be used to establish temporal ordering of traits yet there are still problems involved.

Because of the hypothesized functional relation of traits in a scale, we decided to apply the D'Andrade and Driver method to all the inter-relationships in our scale. Because we were dealing with a small number of tribes we could not use Driver's proportion of total variance, but merely indicated the predominance of history or function in matrices for both adjacent and distant matched pairs. As would be expected, history is more important for adjacent pairs although function does win in several cases where the ϕ 's are strong.

Before it is possible to discuss the implications of these results, it is necessary to introduce certain concepts applicable only to ideal scales. Given a perfect scale it can be demonstrated logically that with any type of matched pairs, the observed hits for function exhibit the same relationship as do the ϕ 's that is to say there is a decrease in the number leaving the line of self-relationship and also vertically and horizontally from any cell. Again on a logical basis, the strength and degree of independence of the correlations follow this pattern. However, in any scale with errors these conditions do not hold and all of the difficulties of the Tylor-Galton problem re-enter in a magnified form because of the number of inter-relationships. In this case, unlike the ideal model, it is not self-evident that a stronger ϕ necessarily represents a stronger relationship of variables. Initially we considered using Driver's proportion of total variance on a scale where the N's are large and comparable; but this cannot show the over-all strength and degree of independence of a correlation. Here we reach an impasse, although we still think it necessary to emphasize that the Tylor-Galton problem is inherent in scale analysis.

We have recently decided to look at the problem of independence of variables and scale analysis from a different perspective, although at this point the analysis is not yet completed and we will merely sketch out the procedure. The difficulty with the various Naroll solutions to the problem of independence is that Naroll's diffusion areas

are treated as closed systems. However, by serializing a geographical region using either distance or contact intervals between tribes, a two-dimensional area can be converted into a uni-dimensional run and Maroll's interval sift applied. (Maroll and D'Andrade, 1963)

In summary: (1) the elaboration of menstrual taboos to men has not been taken into consideration by previous researchers--our scale indicates that restrictions on men can also be present; (2) the problem of scales within scales and regional variations makes it difficult to interpret the meaning of correlations with scales; and finally, (3) the Tyler-Galton problem is in fact inherent in scaling.

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