

APPLYING DISCRIMINANT ANALYSIS TECHNIQUE TO THE STUDY OF SELECTED NIGERIAN SOCIAL VALUE ORIENTATIONS

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The study was aimed at identifying Nigerian ethnic characteristics which are associated with specific social-value orientations. The subjects comprised 196 persons chosen randomly from a pool of 396 respondents who participated in a study on the relationship between socio-cultural systems, value orientations and career aspirations. The number represented 72 Igbo, 61 Yoruba, and 63 Hausa (N= 196). The 18 discriminating social-values items were selected from 25 original items. Discriminant Analysis was employed as a classificatory technique to the data on social value orientations. Two statistically significant discriminant functions were produced: one accounting for 62.4 percent of total variance with Wilk's $\lambda = .499$, χ^2 (df 40) = 128.356, $p < .001$ and the other had Wilk's $\lambda = .760$, χ^2 (df 19) = 50.611, $p < .001$. The items were also used as predictors for the groups in terms of 'actual' group and 'predicted' group membership. All differences in 'actual' group and 'predicted' group membership were statistically significant. Results were interpreted as meaning that the major ethnic groups show significant value differentiation and that these differences lie at the base of their cultural patterns and influence their behaviours towards each other. An understanding of the pattern of these value differentiations may improve the dynamics of group management in Nigeria thus reducing those conflicts which usually arise as the goal - directed activities of one group are interfered with the activities of the other. The need for further psychological studies in value differentiation is recommended.

There is theoretical evidence to show that the three dominant Nigerian ethnic groups under study differ not only on structural terms (e.g., the social structural systems), but also in their behavioural characteristics (e.g., social values) as exemplified in the studies of Coleman, 1958; Smith, 1965; Meek, 1937; Afigbo, 1972; Lloyd, 1955 and Biobaku, 1957.

Coleman (1958) examined critically the ethnic divergencies in Nigeria in his comprehensive socio-political history of colonial Nigeria. It is recognised that he moved towards a psychological question when he attempted to understand the factors accounting for the particular pattern of economic and political development of Nigeria. He observed that these cultural differences have been determined in part by the traditional social values, the attitudes towards property and wealth acquired individually and the relationship between wealth and political power.

Smith (1965) wrote about the Hausa of Zaria, especially on the role of clientage in the competition for office. Smith's studies have been criticised by Ibrahim (1967) who pointed out that nobody enters into clientage to remain subservient. However, Smith maintains that status description remains primarily ascriptive in the Hausa system.

Other studies about the other groups like the Igbo as exemplified in the studies of Afigbo (1972), Isichei (1976) and Ottenberg (1955) outline contrasts with Hausa and Yoruba value system. The Igbo, according to these studies had segmentary and non-hierarchical status systems which encouraged competition and individual acquisition of wealth which is translated into political power. The Yoruba culture according to Biobaku (1957), Bascom (1942) and Lloyd (1955) provide an environment rewarding to both the independent occupational achievement of the Igbo and loyal clientage of the Hausa ideal.

An understanding of a peoples value system is important in the characterisation of their personality and their economic motivation. Holland (1973) argues that people search for abilities, express their attitudes and values and take on agreeable problems and roles. King (1971) had found that 50 percent of Kipsigis pupils of East Africa wanted to become teachers while only 3 percent aspired for technical jobs; while only 20 percent of Kikuyu pupils had interest in teaching and greater percentage favoured technical jobs. Butcher (1960) noted the unwillingness of the Fulbe to be employed in the Marampa Mine of Sierra-Leone. Fulbe, like the Pakot and Masai, have dominant cattle values and are not keen to take

Western employment. All these make the study of value orientations intriguing and important.

METHODOLOGY

Subjects

The group members comprised 72 Igbo; 61 Yoruba; and 63 Hausa- a total of 196 subjects with mean age of 27.2 years. These were randomly selected from a pool of 396 respondents who participated in a wider study on the relationship between socio-cultural systems, value orientations and career aspirations.

Objective

The primary aim of this exercise is to use Discriminant Analysis as a form of classificatory technique to show how many of the actual number of respondents from each of the ethnic groups do statistically exhibit the characteristics associated with their sub-cultural areas. For instance, in a preliminary study, it was found that out of 50 Igbo, about 30 exhibited social values attributed to the Igbo in their behaviour, the rest (20) showed differential patterns related to either Hausa or Yoruba orientations.

Number of Value Orientations

Twenty-Five (25) value orientation items were subjected to Discriminant Analysis using the Statistical Package for Social Sciences (SPSS) sub-programme Discriminant, in order to identify ethnic characteristics associated with social values. Often the researcher is faced with the situation where there are more discriminating variables (25) than necessary or desirable to achieve satisfactory discrimination. The most important discriminating variables were thus selected by a stepwise procedure in the SPSS sub-programme. The eighteen (18) most important variables turned out to be; Luck, Destiny, Money, Family, Traditional Life, Respect for leader, Male dominance, Belief in people, Wealth and happiness, Religion, Female

adultery, Independence, Old customs, Respect for elders, Belief in wealth, Male adultery, Fatalism, and Respect for employer.

Table 1

Standardised Discrimination Function Coefficient on 18 Value Statements Variables for the Two Significant Discriminant Functions for Three Ethnic Groups

Items keyed to original Numbers	Variable Name	Discriminant Functions	
		I	II
1.	Luck	-.08	-.19
2.	Destiny	-.49	-.50
3.	Money	-.09	.03
4.	Family Authority	.25	-.35
5.	Traditional life	-.15	.01
6.	Respect for Leader	.04	.28
7.	Male Dominance	.20	.21
8.	Belief in People	.21	.28
9.	Wealth and Happiness	-.65	-.23
10.	Religion	.08	.48
11.	Female Adultery	.03	-.47
12.	Independence	.31	-.01
13.	Old customs	-.28	.26
14.	Respect for Elders	-.15	-.29
15.	Belief in Wealth	-.25	-.44
16.	Male adultery	.18	-.30
17.	Fatalism	-.25	.50
18.	Respect for Employer	-.34	.05

RESULTS

The analyses were performed in two stages. In the first stage the classification of three groups was done, i.e., Hausa, Igbo, and Yoruba. In the second stage the groups were examined pair-wise in order to establish differences between them.

In the test of overall group/ethnic differentiation (i.e., first stage analysis) the 18 value orientation items significantly differentiated among the three ethnic groups. Two discriminant functions resulted: one, accounting for 62.4 percent of total variance, Wilk's $\lambda = .499$; χ^2 (df 40) = 128.356, $p < .001$; and the other accounting for 37.6 percent variance, Wilk's $\lambda = .760$; χ^2 (df 19) = 50.611, $p < .001$.

The nature of the discriminant functions can be determined by examining the coefficients of each of the 18 value statements with discriminant functions (table 1).

The first function is most notably characterised by high negative coefficients for item 9: wealth and happiness (-.65); item 2: destiny (-.49); item 18: respect for employer (-.34) and positive coefficients for item 12: independence (.31). The second function had highest positive coefficients for item 17: fatalism (.50); item 10: religion (.48) and highest negative coefficients for item 2: destiny (-.50); item 11: female adultery (-.47); item 15: belief in wealth (-.44) and item 4: family authority (-.35).

As a check on the adequacy of the discriminant functions, the 18 items served as predictors for the groups. The 'actual' groups comprised 72 Igbo, 61 Yoruba and 63 Hausa (total 196). The classification of the groups is given in table 2. The chi-square which is significant at $p .01$ indicates that the samples signify genuine population differences.

It is immediately evident from the diagonal in table 2 that nearly 69 percent of the group was correctly classified (adding up the diagonal percentages); this percentage being made up of Hausa, 27.6; Igbo, 22.4 and Yoruba, 18.9. This indicates that better predictions could be made for Hausa followed by Igbo and Yoruba. The percentage differences should be interpreted as percentage of 196 cases and not the total for each ethnic group sample. For example, the Hausa, 27.6 correct predictions (table 2), is calculated on the total of 196 cases and not on 63 Hausa cases. If, in fact, the actual percentages on individual group cases are calculated then 54 correctly classified cases of Hausa are nearly 86 percent of 63 cases.

Table 2

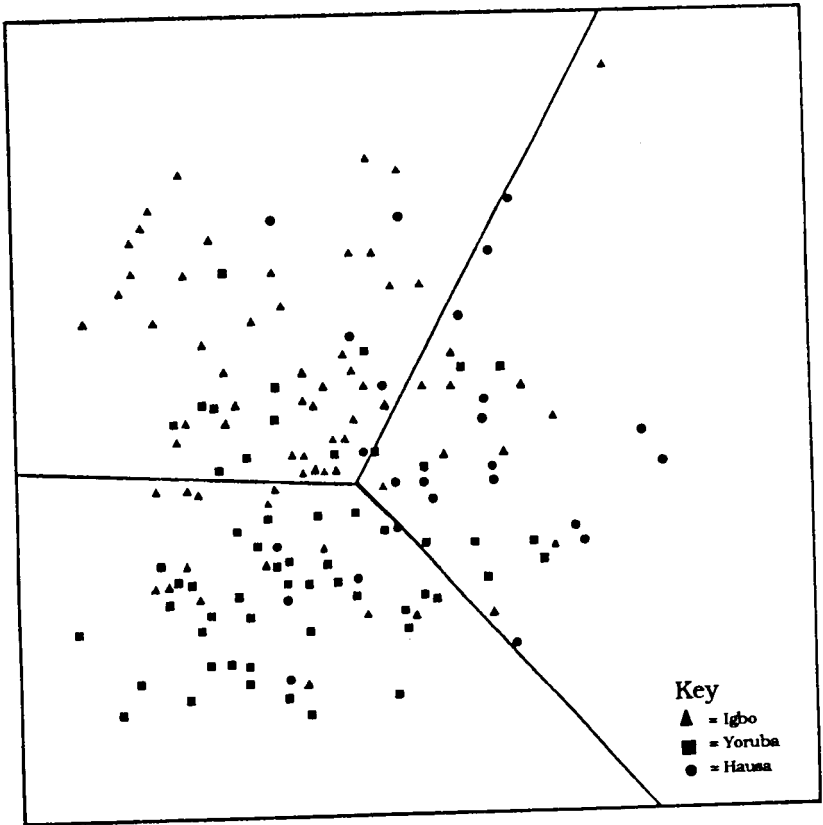
Numbers and Percentages (in parentheses) of Predicted Group Membership

Actual Group Membership	Number of Cases	Predicted group membership			
		Hausa	Igbo	Yoruba	Total
Hausa	63	54 (28)	5 (3)	4 (2)	63 (33)
Igbo	72	12 (6)	44 (22)	16 (8)	72 (36)
Yoruba	61	11 (6)	13 (6)	37 (19)	61 (31)
Total	196	77 (40)	62 (31)	57 (29)	196 (100)

$$\chi^2 = 111.431 \text{ (df= 4), } p < .01$$

The Hausa 28 percent and the Igbo 22 percent correct classifications represent the highest percentages of correctly classified group members. The whole group percentage classification (table 2) may be misleading. In reality, 86 percent Hausa, 61 percent Igbo and 60 percent Yoruba were correctly classified.

It is apparent that better predictions could be made for Hausa than for Igbo and Yoruba. What this seems to suggest is the polarisation of the Hausa on one hand, and Igbo-Yoruba on the other.



Statistical Classification of Igbo, Yoruba, Hausa on Value Orientations: A Discriminant Analysis

Figure 1

A graphic representation of the group classification is shown in figure 1. The figure shows both correctly and incorrectly classified cases. By measuring the distances between the group centroids, and finding the mean for each distance, it was possible to define a point which was equidistant to the 3 points. A line is drawn from this point through the mid point of the distances connecting the centroids. The three groups are then separated and possible misclassifications are easily identified. It is important to note that a point could represent more than one individual in a group. This is possible because the computer system does not show two individuals whose scores fall on the same point. It is

possible, therefore, to have a lower number of individuals than is the case in the original absolute number.

It is easily seen from figure 1 that this symbol (\blacktriangle = Igbo) dominates the upper left hand corner, while this (\blacksquare = Yoruba), dominates the lower left hand corner and this (\bullet = Hausa) dominates the right hand corner. The number of misclassifications of each group is reflected in the total number of that group found in different zones. Ideally, these misclassified numbers when counted from figure 1 should equal the misclassifications in table 2. Referring to table 2, therefore, we expect to find 13 misclassified Yoruba in Igbo (21 percent), 11 misclassified Yoruba in Hausa (22 percent) and 12 misclassified in Hausa (about 17 percent). For the Hausa, it is expected to find 5 misclassified in Igbo (8 percent) and 4 misclassified in Yoruba (6 percent).

On the whole, there were 28 misclassifications from the Igbo; 24 from the Yoruba and 9 from the Hausa.

In the second stage, using Discriminant Analysis again, each ethnic group was classified against the other as follows: Igbo against Hausa; Igbo against Yoruba; Yoruba against Hausa. This was done to determine the degree of accurate prediction, and the degree of differentiation of group versus group and *not* group versus whole sample as in stage 1. The classification for Igbo versus Hausa is summarised in table 3. The chi-square test was significant ($p > .001$), again suggesting that the two groups came from different populations.

From table 3 it is apparent that when Hausa is compared with Igbo, the correctly predicted percentage of Hausa cases improves from 28 percent to nearly 42 percent or from 85 percent to nearly 89 percent (56 out of 63). Igbo percentage also improves from 22 percent to 44 percent or from 61 percent to 83 percent (60 out of 72). This indicates that when Igbo is compared with Hausa, both improve their predictive classificatory quality but the Hausa becomes even more distinct than when it was submerged in the total population. The total number of correctly classified cases was 116 out of 135 (85.9 percent). This total percentage of correct classification also improved significantly which was 68.9 percent previously.

Table 3

Numbers and Percentages (in parentheses) of Ethnic Group Members Classified by their Discriminant Scores on 18 Value Statements (Igbo Versus Hausa)

Actual Group	Number of Cases	Predicted group membership		
		Igbo	Hausa	Total
Igbo	72	60	12	72
		(44)	(9)	(53)
Hausa	63	7	56	63
		(5)	(42)	(47)
Total	135	67	68	135
		(49)	(51)	(100)

$$\chi^2 = 69.696 \text{ (df= 1), } p < .001$$

The next step is to compare Igbo against Yoruba. The classification is summarised in table 4. The chi-square shows that the Igbo and Yoruba belong to different populations. The difference is significant at $p < .001$ level.

The table shows that when Igbo is compared against Yoruba, there is a slight drop in correct Igbo classification, relative to Hausa (41 percent against 44 percent) or 76 percent against 83 percent if individual sample percentage was calculated, i.e., 55 out of 72. The Yoruba, however, improves from the population sample classification, that is, from 31 percent to 35 percent, or 75.4 against population percentage of 60.6 (if based on 61 cases only).

Table 4

Numbers and Percentages (in parentheses) of Ethnic Group Members Classified by their Discriminant Scores on Eighteen Value Statements (Igbo versus Yoruba)

Actual Group	Number of Cases	Predicted group membership		
		Igbo	Yoruba	Total
Igbo	72	55 (41)	17 (13)	72 (54)
Yoruba	61	15 (11)	46 (35)	61 (46)
Total	133	70 (52)	63 (48)	133 (100)

$$\chi^2 = 35.77 (df = 1), p < .001$$

The overall classification estimate for Igbo-Yoruba is 75.9 which is the percentage of accurate classification for both groups. The Igbo versus Yoruba data indicate that Igbo as a group have better predictions of membership when classified against Hausa than with Yoruba. In other words, the Igbo are probably more polarised with Hausa than Yoruba.

The classification between Yoruba and Hausa summarised in table 5 shows that the Hausa are equally polarised with Yoruba as the Igbo - Hausa. The differences are statistically significant at .001 level. This suggests that both Hausa and Yoruba do show similar variability as was the case between Igbo and Hausa; but perhaps not as marked as Igbo-Hausa. The total percentage of correct classification between Yoruba and Hausa is nearly 88 percent, which is a little higher

than the total percentage of correct classification between Igbo and Yoruba (76 percent).

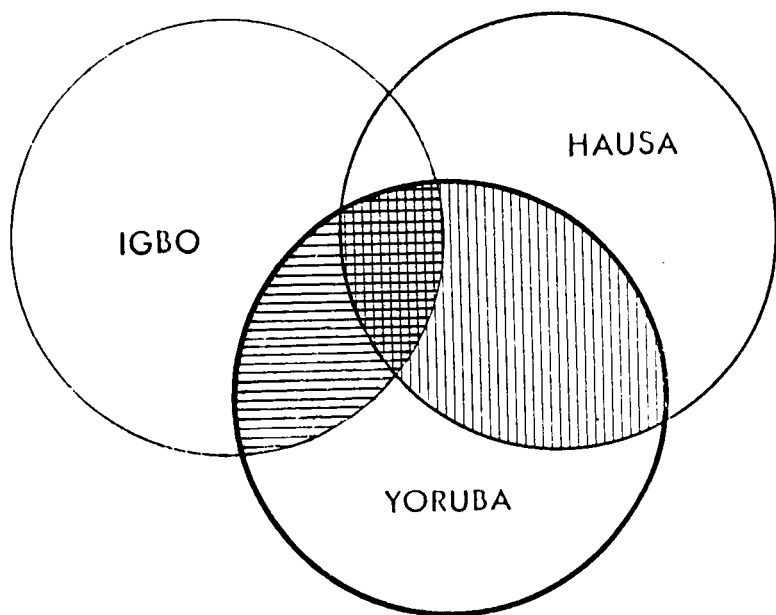
Table 5

Numbers and Percentages (in parentheses) of Ethnic Group members Classified by their Discriminant Scores of Eighteen Value Statements (Yoruba Versus Hausa)

Actual Group	Number of Cases	Predicted group membership		
		Yoruba	Hausa	Total
Yoruba	61	50 (40)	11 (9)	61 (49)
Hausa	63	4 (3)	59 (48)	63 (51)
Total	124	54 (43)	70 (57)	124 (100)

$$\chi^2 = 71.258 (df = 1), p < .001$$

This suggests that although the Hausa and Yoruba may appear to be polarised, the greatest polarisation as indicated in these tables is between Igbo and Hausa. Since the Igbo are more polarised with both Hausa and Yoruba, and Yoruba is less polarised with Hausa, it is plausible to conclude that the Yoruba falls between Igbo and Hausa but much nearer to Hausa than Igbo. This hypothetical spatial representation of three groups has been shown in figure 2.



Area assumed to be common to Hausa, Igbo & Yoruba



Intuitive space representation of the sociocultural relationships between Hausa, Igbo and Yoruba

Figure 2

The position of Yoruba may be explained by their mixed religious affiliations. Therefore, another discriminant analysis was done between Igbo and Yoruba, controlling for religion in Yoruba, i.e., all Moslems were excluded. The result (table 6) shows that 12 individuals or 29 percent of the cases were still misclassified. This suggests that although religion contributes to the variations in values, it is not sufficient to explain the differences in the misclassified Yoruba cases.

The circles (figure 2) indicate that the Yoruba shares more social values with both Igbo and Hausa than the Igbo shares with the Hausa. The central core indicates what they all share in common.

Table 6

Numbers and Percentages (in parentheses) of Ethnic Group Members Classified by their Discriminant Scores on Eighteen Value Questions (Igbo Versus Yoruba – without Moslems)

Actual Group	Number of Cases	Predicted group membership		
		Igbo	Yoruba	Total
Igbo	72	56	16	72
		(49)	(14)	(63)
Yoruba	41	12	29	41
		(11)	(26)	(37)
Total	113	68	45	113
		(60)	(40)	(100)

$$\chi^2 = 28.75 (df = 1), p < .001$$

Table 7

Standardised Discriminant Function Coefficients for Igbo-Hausa Comparison

Item	Name of Variable	Function Coefficients
1.	Luck	-.32
2.	Destiny	-.28
3.	Money	.19
4.	Family Authority	.20
5.	Traditional Life	-.29
6.	Respect for Leader	.07
7.	Male Dominance	.32
8.	Belief in People	.23
9.	Wealth and Happiness	-.73
10.	Religion	-.22
11.	Female Adultery	.25
12.	Independence	.34
13.	Old Customs	-.36
14.	Respect for Elders	-.43
15.	Belief in Wealth	-.63
16.	Male Adultery	.22
17.	Fatalism	-.63
18.	Respect for Employer	-.41

It may be possible to identify these communalities of values by examining the degree to which certain items discriminate between all the groups, or pairs of groups. The items which discriminate significantly among these groups were, therefore, examined. The standardised discriminant function coefficients of 18 items for the Igbo-Hausa analysis is given in table 7.

The discriminating items include item 9 (wealth and happiness), item 15 (belief in wealth), item 17 (fatalism), item 14 (respect for elders) and item 18 (respect for employer). Other loadings include item 13 (old customs), item 7 (male dominance), item 12 (independence) and item 1 (luck).

The Igbo-Yoruba comparison given in table 8 shows that only few items load highly. This suggests that most of the items do not discriminate strongly between Igbo and Yoruba. For instance, item 9 (wealth and happiness) which discriminate between Igbo and Hausa fails to discriminate between Igbo and

Yoruba. Among the variables which discriminate between Igbo-Hausa and Igbo-Yoruba include item 17 (fatalism) and item 15 (belief in wealth). In addition, items 2, 10 and 11 also discriminate between Igbo-Yoruba.

The items that discriminate between Yoruba and Hausa include item 2 (destiny), item 9 (wealth & happiness), item 15 (belief in wealth), item 8 (belief in people) and item 19 (religion). Among these, only items 9 and 15 are common to Igbo and Yoruba, suggesting, perhaps, a sense of communality between Igbo and Yoruba (excluding Hausa) regarding these values.

Table 8

Standardised Discriminant Function Coefficients for Igbo-Yoruba Comparison

Item	Name of Variable	Function Coefficients
1.	Luck	-.11
2.	Destiny	.50
3.	Money	.19
4.	Family Authority	.34
5.	Traditional Life	-.08
6.	Respect for Leader	-.34
7.	Male Dominance	.14
8.	Belief in People	-.16
9.	Wealth and happiness	.32
10.	Religion	-.53
11.	Female Adultery	.40
12.	Independence	-.21
13.	Old Customs	-.23
14.	Respect for Elders	.09
15.	Belief in Wealth	.39
16.	Male Adultery	.19
17.	Fatalism	-.45
18.	Respect for Employer	.02

Table 9 shows comparison of Yoruba against Hausa.

Table 9

Standardised Discriminant Function Coefficients for Yoruba-Hausa Comparison

Item	Name of Variable	Function Coefficients
1.	Luck	.04
2.	Destiny	.79
3.	Money	-.25
4.	Family Authority	-.18
5.	Traditional Life	.37
6.	Respect for Leader	-.06
7.	Male Dominance	.11
8.	Belief in People	-.41
9.	Wealth and Happiness	.76
10.	Religion	-.43
11.	Female Adultery	.26
12.	Independence	-.26
13.	Old Customs	.17
14.	Respect for Elders	.23
15.	Belief in Wealth	.56
16.	Male Adultery	-.14
17.	Fatalism	-.12
18.	Respect for Employer	.26

In other words, the Igbo and Yoruba are nearer to each other in these values than are both of them to Hausa. But again one finds that destiny (item 2) discriminates between Yoruba and Hausa, on the one hand, and Yoruba and Igbo on the other, suggesting that the Yoruba is more polarised in this variable from both Igbo and Hausa.

When the relationships of these variables are taken together they suggest that the Igbo and Hausa polarity may have some empirical validity and be worth examining in more detail in other cultural and psychological areas. The position of the Yoruba is understandably somewhere between the two.

Such ordering appears to have ethnographic and structural reality. The findings of these differences suggest the possibility of explaining the relation of values to aspirations, both educationally and occupationally, in the ethnic groups of Nigeria.

DISCUSSION

The values which appear to discriminate between Igbo and Yoruba are Destiny (belief in luck/destiny), Religion and Female adultery.

Value items that discriminate between Igbo and Hausa include Wealth and happiness, Respect for elders, Belief in wealth, Fatalism and Respect for employer.

Items that discriminate between Yoruba versus Hausa include Destiny, Belief in people, Wealth and happiness, Religion and Belief in wealth.

It is clear that a group can be under stress or conflict with another group when its goal-directed activities are interfered with by the goal-seeking activities of another group. Incongruity in value systems can generate frustrations and conflicts amongst groups. Such conflicts can assume not only sectional but also ideological flavour. It is important, therefore, to understand what values are internalized and ascribed to by some ethnic groups in our society and how these may be at variance with those of other groups in order to understand differential behaviours. Values often reinforce certain qualities and do not encourage the development of others. Careful analysis of the effects of their cultural contingencies would allow a reshaping of the culture to support the unfolding of human qualities that are more highly valued.

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