2003

Measuring Culture and Cultural Change

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Measuring Culture and Cultural Change

Grid/Group analysis, which has formed the base of culture theory in political science, was first established by Mary Douglas in Cultural Bias (1978). Since Cultural Bias, Grid/Group analysis has been applied throughout all the fields of the social sciences and has been used to explain ideas in political science like social

policy decisions (Douglas and Ney 1998), risk aversion (Douglas and Wildavsky 1983), and environmental activism (Ellis and Thompson 1997). However, when Mary Douglas first formulated grid/group analysis, she believed its greatest strength was that it allowed for an interaction between the individual and the group and this interaction gave the individual a choice in determining his culture. It was this interaction that set grid/group analysis apart from previous culture theories, because it was neither deterministic nor saw culture as autonomous (Douglas 1978). In addition, this interaction makes Douglas's theory excellent for measuring cultural change, because it allows a degree of agency in the cultural decision. Unfortunately, there has been little work done in this regard. There has been some theorizing about a process for cultural change using grid/group analysis, for example Lockhart (1999) and Thompson, Ellis, and Wildavsky (1990). However, there has been virtually no empirical work done in an effort to demonstrate and possibly predict cultural change using grid/group analysis. This leads to my original research question: how does culture change over time?

Before finding a theory of culture that can explain cultural change, it is imperative to find a theory that allows culture be operationalized to see if change is occurring. This is where Douglas's theory runs into problems. It is clear Douglas's theory can be operationalized, as shown in Jonathan Gross and Steve Rayner's book entitled Measuring Culture (1985). They explain exactly how they would operationalize grid and group to measure the culture of the various groups within a hypothetical community. However, the Gross and Rayner indicators were designed to test the culture of individual groups using a case study methodology. This poses a problem for large-scale studies, like the one proposed here. Therefore, a new set of indicators needs to be chosen for grid and group that use Douglas's theory to test wide-scale cultural change. Since a new set of indicators must be established before cultural change can be tested, the aim of this paper is to establish these indicators.

The World Values Survey seems like an ideal data source for a wide-scale time-series study of culture and cultural change, because it asks a wide variety of questions to a cross-national sample of counties over time. As described in the first line of the World Values Survey Code Book, "this data collection is designed to enable cross-national comparison of values and norms in a wide varieties of areas and to monitor changes in values and attitudes of

mass publics in 45 societies around the world" (World Values Study Group 1999: iii). However, the World Values Survey has never been used as an indicator of grid and group in the past, and this is a problem because there are no established, confirmed indicators of grid and group for this data source. This leads to a second research question being tested here: can the World Values Survey be used as an indicator of grid and group?

This question is very important for much more than just studying cultural change; if the World Values Survey proves to be a valid measure grid and group, all branches of the social sciences would have an empirically demonstrated method of quantifying culture for years to come. My three hypotheses are: 1) if the indicators chosen from the World Values Survey truly measure grid and group, then there will be a variance of less than 0.10 between the World Values Survey indicators and the Gross and Rayner indicators; 2) if the indicators chosen from the World Values Survey are a valid measure of grid/group analysis, then there will be a relatively strong correlation between individuals within the same group for the WVS indicators; 3) if the World Values Survey indicators of grid and group are valid, there should be little or no correlation between the indicators for grid and the indicators for group. The paper will proceed as follows: first, an example of the importance of grid/group analysis and an explanation of Douglas's theory, followed by an explanation of the Gross and Rayner indicators of grid and group, then a description of the research design, next an analysis of the data, and finally, the conclusion of whether or not the WVS indicators appear to be valid and steps for further research in this area.

The Importance of Grid/Group Analysis

An example may help clarify why it is important to consider culture when trying to explain individual decisions. Let us consider why Palestinian suicide bombers almost daily decide to kill themselves as well as innocent Israeli civilians. There is no self-interested rational explanation, like rational choice theory would predict, why a Muslim individual from Palestine decides to strap on a bomb and blow themselves as well as all the people around them to pieces.[1]

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[1] Rational choice theorists posit that individuals choose the most efficient means to maximize their utility to achieve there desired ends.

In addition, the only institution in place that could possibly be influencing people to perform these acts is the Islamic religion; however, there is nothing in institutionalist theory to explain these individuals' deadly strong allegiance to their religion.[2] The problem here with both rational choice theory and institutionalist theory is that they are trying to explain individual decisions with group level ideas and beliefs. A culture theory that allows for individual choice, like Douglas's theory, can better explain this action. Using grid/group analysis, the suicide bomber would probably be classified as an egalitarian[3] , or sectarians, because of their extremely strong group allegiance with few rules governing members, little structure, and not readily definable leadership (Douglas 1978). This classification not only explains their strong reliance on the rules and beliefs of the Islamic religion, but in Douglas's theory, egalitarians are in a state of constant fear and anxiety that their group will be penetrated and destroyed by outsiders. Therefore, using grid/group analysis, we can explain the Palestinian suicide bombers intense fear and hatred of the Israeli outsiders that drives them to sacrifice their own lives to kill the Jewish intruders.

The above example clearly shows why culturist theory can sometimes explain the decisions and actions of individuals more adequately than either rational choice or institutionalist theories. However, one objection that has continually arisen from rational choice and institutionalist theorists is that culture theories cannot explain cultural change. Consequently, before a culturist theory can be consistently used as one of the factors in people's decision-making process, it needs to be able to empirically show and explain cultural change.

Using culturist theories that involve individual choice, there have been several explanations of cultural change over time. Harry Eckstein formulated one such theory for cultural change in his essay "A Culturist Theory of Political Change." Eckstein's theory uses culture as a way to "'economize' in decisions to act and to achieve predictability in social interactions" (Eckstein 1988: 792). Yet, in "novel", or unfamiliar, situations, people's cultural dispositions are not equipped to give them clear decisions. These novel situations arise from internal "development," socially internal discontinuities (economic and political crises), or externally

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[2] Institutionalist theory predicts that the institutions set up in society limit and sometimes manipulate individual's actions.

[3] More on egalitarians how the egalitarian sub-culture is formed and what it means is described in the next section.

imposed changes (Eckstein 1988). Eckstein believes that people encounter novel situations frequently, and these situations can either cause cultural patterns to remain the same, change slightly to allow more flexibility in dealing with the unusual situations, or change culture completely. Due to Eckstein's view of culture as "economizing" decisions, it becomes extremely costly to change cultures, because changing cultures is followed by a period of anomie due to lack of or loose internal guidelines to action. Therefore, people opt to keep culture constant if possible; however, there are times of very rapid social and structural reorganization where it is impossible to keep culture constant, and in these times, it must either change entirely or, preferably, change slightly toward flexibility to deal with the unfamiliar situation.

Although Eckstein's economizing view of culture and cultural change is very convincing, it runs into problems from its deterministic nature. Eckstein's theory has an individual element in the choice of culture, but he believes that the reason culture exists is to allow for predictability in decisions, as stated above. As a result, his theory becomes deterministic in the long-run, because once a culture is in place, it is nearly impossible for an individual or group to change cultures without bringing anomie into their lives, due to the great cost of changing decision making processes. Mary Douglas solves this problem by allowing for individual choice in deciding culture and also allowing interaction between the individual and their culture, which Eckstein does not.

Consequently, where Eckstein saw anomie as the result of cultural change, Mary Douglas's theory allows individuals and culture to interact in a way that allows individuals to manage cultural change without social chaos. Douglas says, "Grid/group analysis treats the experiencing subject as a subject choosing…The method allows for the cumulative effect of individual choices on the social situation itself: both can interact, the individual and the environment, and either can move…" (Douglas 1978: 13). In this statement, Douglas is saying first that the individual has a choice of what subculture they belong to, and since every subculture has advantages and disadvantages, an individual can change their subculture if the advantages of being a part of that subculture change. Second, she is saying the environment, or subculture, as well as the individual interact together and shape each other, and the environment can remove the individual if it sees the need. Although, it is less clear how a subculture can ostracize an individual, but as Mary Douglas states in Essays in the Sociology of Perception, "…four

distinctive types [of subculture] are continually present, inexorably drawing individuals into their ambit, delivering to their recruits the choice of thinking alike or suffering the penalties of failure and ostracism" (1982: 5). This statement solidifies the idea that a sub-culture can recruit as well as ostracize or incur penalties on individuals for failure or differences of opinion.

Grid/Group Analysis

       In order to completely understand grid/group analysis, one first has to understand Douglas's view of the negotiating individual. She says, "…the cognitive activity of the real live individual is largely devoted to building the culture, patching it here and trimming it there, according to the exigencies of the day. In his very negotiating activity, each is forcing culture down the throats of his fellow men. When individuals interact, their medium of exchange is culture" (Douglas 1978: 6). In this quote, Mary Douglas is explaining her view of the negotiating individual as one who is constantly interacting with other people in a cultural context. Every action and decision a person makes has a cultural element to it, and as a person makes decisions, they are attempting to coerce and influence other individuals to become members of their culture with their decision making pattern. In addition, every individual is shaping their culture based on their particular needs of the day, but as she explains later, individuals are also being shaped by their culture as well.

       Douglas's idea of the individual is crucial to understanding her theory for grid/group analysis, because it is the interaction amongst individuals and between individuals and the group that makes her theory so unique. It is due to these interactions that a person chooses a particular culture, or typology. To understand how this works, it is imperative to understand how a typology is formed. There are two sides to each typology: a "social context" and a "cosmology". The social context referred to here is "a context conceived in strictly social terms, selected for its permitting and constraining effects upon the individual's choices. It consists of social action, a deposit of myriads of individual decisions made in the past, creating a cost-structure and the distribution of advantages which are the context of present day decisions" (Douglas 1978: 6). In other words, the social context is the rules or guidelines and individual uses to make their decisions. Consequently, an individual's choice about whether or not to join a particular group with a particular typology and associated social context will be

determined by the distribution of advantages that person receives from being a member of that particular typology, or environment, based on their past decisions.

Once a person has chosen to be a member of a group, the environment begins to shape the individual by providing a cost-structure to influence decisions. In order for an individual to make sense of his environment, he needs a set of guiding principles or ideas to guide him. This is provided by the cosmology that is associated with each of the typologies. By cosmology, Douglas means "the ultimate justifying ideas which tend to be invoked as if part of the natural order and yet which, since we distinguish four kinds of cosmology, are evidently not at all natural but strictly a product of social interaction" (Douglas 1982: 5). Based on this definition, we can conclude that each cosmology is the set of ideas developed by a person for interpreting their environment and justifying their actions, or in other words, a cosmology is what a person uses to perceive events that happen in their environment, like a cultural filter.

Therefore, typologies are a direct measure of the "social context" of a group, and each of the social contexts has an implicit "cosmology". A person's grid and group scores determine what typology they have placed themselves. Grid and group measure the social context of each typology[4]. As stated by Mary Douglas in Cultural Bias, "the term grid suggests a cross-hatch of rules to which individuals are subject in the course of their interaction. As a dimension, it shows a progressive change in the mode of social control" (1978: 8). Under this view, grid refers to the level and type of control that members of a group are subject to in their everyday interaction with other members of the group and society, where maximum freedom from control represents a low grid condition and maximum control represents a high grid condition.[5] On the other hand, group refers to the strength of attachment to a group. Mary Douglas says, "the strongest effects of group are to be found where it incorporates a person with the rest by implicating them together in common residence, shared work, shared resources and recreation, and by exerting control over marriage and kinship"

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[4] The social context for each typology is most clearly laid out on pages 19-21 of Cultural Bias.

[5] Control can be exerted internally by the leadership of the group or in the case of the fatalists control can be exerted eternally from members of other groups.

(Douglas 1978: 14). Therefore, a strong group score would be where the group infiltrates every aspect of a person's life, and a low group score would be one where a person is free to come and go as he pleases with little or no time or allegiance given to the group. Based on how a particular group scores for these two measures, it is assigned one of four typologies, or subcultures, as shown below.

Figure 1: **The Four Typologies**

High Grid	Fatalist	Hierarchical
Low Grid	Individualism	Egalitarian
	Low Group	High Group

At low grid, low group, a person is in the individualist typology. A person in this typology is free to negotiate amongst fellow members, choose his allies and enemies, and move up or down in the social ladder. At low grid, high group, a person is in the egalitarian typology. This is the typology of the suicide bomber in the example on page two. Here there is a strong external group boundary, but little or no segregation or division of roles within the group. Each member has the potential to play every role; however, fear of outsiders infiltrating the group is constant and can become overwhelming to members of this typology. At high grid, high group, a person is in the hierarchical typology. This typology has strong internal and external boundaries. Roles are predetermined and fixed, and everyone knows their place and duty in the group. Finally, at low group, high grid, a person is in the fatalist typology. People are sent here by members of the other typologies to do as they are told. Individuals in this typology do not receive the protection and privileges of group membership, but they are still not free to do as they please because they are subject to the rules set down by their high grid environment. There are people here in all societies, and this is sometimes referred to as the forgotten typology.[6]   (Douglas 1982)

It is important to note that Douglas does not think typology can be measured solely by cosmology. She states, "Given these

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[6]In any given society, there is the possibility of individuals falling into all four typologies depending on which group they belong.

four distinctive contexts…the next stage is to elucidate elements of cosmology which are not circularly implied in the definition of social context and to show that a distinctive cosmological bias is generated by the character of explanations and justifications that are plausible in each social context" (Douglas 1978: 22). This means that there may tend to be a particular cosmological bias associated with each social context, but even though each typology has an implicit cosmology, it is not guaranteed that every person in a typology has the same cosmological bias.[7] Therefore, it is impossible to correctly measure typology based solely on cosmology, because cosmology could be slightly different for every member of a group. Consequently, one needs to measure a combination of social context and cosmology or only measure social context to correctly determine an individual's typology. This is extremely important to this study, because the questions chosen from the World Values Survey as indicators of grid and group must try to ascertain social context, rather than cosmology. Measuring Culture

The first step for testing the validity of the World Values Survey as an indicator of grid and group is finding a set of pre-established indicators of grid and group to test the new indicators from the World Values Survey against. As explained in the literature review above, Jonathan Gross and Steve Rayner developed the first empirical model for measuring grid and group. Their work, Measuring Culture (1985), has been used as a model for measuring culture in works by Wildavsky (1987), Thompson, Ellis, and Wildavsky (1990), Douglas and Ney (1998), and Ney and Molenaars (1999). In addition, Caulkins did a factor analysis choosing indicators of grid and group from the Gross and Rayner model to see if their indicators were truly measuring different things, as they claim.[8] Although there were some factors that loaded in unexpected patterns, Caulkins found that the correlations from the factor analysis generally support Gross and Rayners'

[7]This idea is furthered by Mary Douglas's belief that the typologies are type of polythetic classification. By polythetic classification, she means a classification that "identifies classes by a combination of characteristics, not requiring any one of the defining features to be present in all members of a class" (Douglas 1978: 15). Therefore, not all of the characteristics of a typology must be displayed by each member, but all members should display a majority of the characteristics of a typology.

[8]They say, "There are superficial reasons why two of our predicates scores might appear to be measuring the same thing. However, whatever correlations are discovered empirically are aspects of culture and organization, not of our mathematical model (Gross and Rayner 1985: 84).

claim that their indicators measure different aspects of grid and group. Therefore, due to the widespread use of the Gross and Rayner indicators among scholars in the social sciences and at least one study testing the validity of measures themselves, this seems like an excellent set of indicators to test the validity of World Values Survey indicators against.

Measuring Culture begins with a hypothetical community where a new nuclear power plant is being built near-by (Gross and Rayner 1985).[9] In the community, there are five different groups that could be analyzed using grid/group analysis, and all five have different views on the new nuclear power plant. To assess the cultural bias of the different groups, a set of researchers is assigned to each group, and each group is observed over the course of a three-month period of time to ascertain the structure of the groups. For the group measure, there are five indicators: proximity, transitivity, frequency, scope, and impermeability, and for the grid measure, there are four indicators: specialization, asymmetry, entitlement, and accountability. All of these indicators give an ordinal measure from zero to one. Each person from a group receives a score for each of the grid and group indicators. Then, all the individual scores for the group are aggregated to give a group score for each indicator. Finally, the five group measures are averaged and the four grid measures are averaged to give an average grid and group score for each group. Since the average score for grid and group is between zero and one, a group score from 0.00-0.50 is low group, and group score from 0.51-1.00 is high group, and likewise, a grid score from 0.00-0.50 is low grid and a grid score from 0.51-1.00 is high grid.

It is important to note that Gross and Rayner intended this model to only be a guide for future research in this field. As they say, "We describe methods of observation, the principles of experimental design, and the techniques of recording data that are appropriate to our paradigm. It is possible to modify them to meet the special needs of a study" (Gross and Rayner 1985: 87). Therefore, the model they lay out in *Measuring Culture* may be adapted to fit any particular research design. For example, in the factor analysis mentioned above, Caulkins considered impermeability the best indicator of group and asymmetry as the best indicator of grid for his study, because these two indicators seemed the most closely related to what Douglas meant when describing grid and group.

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[9]Since this was a hypothetical example, none of the activities really happened and all the data is hypothetical as well.

Further, Gross and Rayner do more than just allow for adaptability in their model of grid/group measurement, they also give suggestions for future researchers to use. These suggestions as well as the possible adaptability of the Gross and Rayner model were very important parts in preparing the research design below.

Research Design

Now that the Gross and Rayner model has been explained and established as a valid indicator of grid/group analysis, it has to be molded to fit the time and resource constraints as well as the nature of this project. The only significant modification being made here is that not all of the indicators of grid and group will be used.[10] The group indicators that will be used here are frequency, scope, and impermeability,[11] and the grid indicators that will be used are specialization and entitlement.[12] These indicators were chosen based on their availability in the groups being studied, and their ability to most validly measure Douglas's idea of grid and group. The scope and frequency scores were be obtained by the members of each group being surveyed filling out a time allocation table,[13] the entitlement score is determined by a question on the

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[10] Gross and Rayner make some suggestions and identify some problems with measuring their indicators using a survey, and these were taken into account when designing the survey given here.

[11] When explaining the difference between high and low group, Douglas mostly gives reference to the amount of time and number of activities done with the group, but in addition, she does mention boundedness or inability to penetrate a group as important when measuring high group (Douglas 1978). These traits seem to be measured much better by the chosen indicators, rather than scope or transitivity, which to some extent both measure the level of interaction between members in the a group.

[12] Douglas believes the most important component of the grid dimension is "insulation…which corresponds to strong social classification" (Douglas 1978: 16). In her view, high levels of insulation, or a highly classified individual with little room for personal choice, guarantee a high grid condition, but with low levels of insulation, a group can be considered high or low grid depending on the levels of autonomy, control, or competition within the group. Therefore, it is essential to measure the level of insulation in a group to determine its grid score, and all the Gross and Rayner indicators do this to some extent. However, specialization and entitlement seem to get at Douglas's idea of insulation best, and due to a major time and resource constraint, the researcher here was unable to perform the in-depth needed to adequately measure asymmetry or accountability.

[13] An uncompleted coded survey with the formula used for determining frequency and scope is given in appendix one.

survey and information gained from an interview with the president of each group[14], and the two remaining indicators were obtained through an interview with the president of each of the groups being studied[15]. The scores for the grid indicators and the group indicators were aggregated separately to give a total grid score and total group score for each group using the Gross and Rayner indicators. The assumption being made with these scores is that they are the average of each member's grid and group scores for the Gross and Rayner indicators.   This assumption does follow, provided this study is an accurate representation of the original Gross and Rayner model.

The next step is choosing a set of questions from the World Values Survey to act as indicators of grid and group. The questions from World Values Survey (World Values Study Group 1999) were carefully chosen to be an accurate measure social context and not the cosmology of the group. As explicitly stated above, the typologies are based on the social context, or structure of the group, and consequently, typology cannot be measured by cosmology alone. This is particularly important here, because if the indicators chosen measure cosmology rather than social context, they may be shown valid in this study, but when applied in future studies, they may not correctly measure grid and group and could possibly lead researchers to false conclusions. Therefore, it is extremely important that each question chosen is measuring social context.[16]

The survey was given to five groups on Illinois Wesleyan's Campus: WESN, Kappa Kappa Gamma, Circle K, Tri-Beta, and Sigma Alpha Iota. It was administered by the president of each of the groups at one of their meetings. The presidents of the groups were simply instructed to hand out the surveys and not say anything in the way of instructions. The first four groups were chosen in an

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[14] One-third of the entitlement score is based on the average of the individual answers to question seven on the survey in appendix one, and the remaining two-thirds is ascertained from the interview with the president. The formula for calculating the entitlement score is given in appendix two.

[15] A copy of the questions asked and the answers given by the president of each group as well as the equation used to determine specialization, impermeability, and the Gross and Rayner grid and group scores is given in appendix two.

[16] A coded copy of the survey as well as how grid and group were scored is provided in appendix one, so the reader can try to determine for himself or herself whether these questions adequately measure the social context.

attempt to have one group surveyed from each of the four typologies.[17] The final group, Sigma Alpha Iota[18] , was chosen to increase the number of people being surveyed, because there was such a poor response from the first four groups. Based on their answers to the questions chosen from the World Values Survey, each person received an individual grid and group score. Like the Gross and Rayner model, the grid and group score that each person received was an ordinal rank from 0-1. For the group score, 0.00-0.50 signifies low group and 0.51-1.00 signifies high group, and for the grid score, 0.00-0.50 signifies low grid, and 0.51-1.00 signifies high grid.

Once the data had been gathered for these groups, the World Values Survey indicators are to be tested against the Gross and Rayner indicators as implied by the hypotheses above. If there seems to be little variance between the WVS indicators and the Gross and Rayner indicators, and there seems to be some correlation between the individual World Values Survey indicators in each group with little correlation between grid and group, then the World Values Survey indicators can be used to test the original research question above. However, if the World Values Survey indicators do not appear to be a reflection of grid/group analysis or the Gross and Rayner indicators, then new World Values Survey indicators will have to be found and tested before cross-country comparison can be done using the World Values Survey.

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[17] WESN was supposed to most closely represent the fatalists; Kappa Kappa Gamma was supposed to most closely represent the hierarchical typology; Circle K was supposed to most closely represent the egalitarian typology; finally, Tri-Beta was supposed to most closely represent the individualist typology. Although these groups were chosen because they displayed some of the properties of their preliminarily assigned typologies, the majority of individuals from each of these groups was expected to fall within the individualist typology, because most of them are from a highly individualist culture, the United States, and Illinois Wesleyan University is a fairly competitive campus. However, preliminary classification of the groups is not fixed nor does it determine the final result; as stated by Gross and Rayner, "we might anticipate that, in real cases, some social units do not turn out to be where a [preliminary] assessment put them" (Gross and Rayner 1985: 110). Therefore, there could be a case where a group is preliminarily placed in the hierarchical typology and the group ends up individualist after the quantitative analysis is done.

[18] This group is primarily placed in the hierarchical typology, like the Kappa Kappa Gammas.

Data Analysis

Based on the length and the survey, the way it was imple-
mented, and the size of the groups surveyed, I should have gotten
approximately a fifty-percent response rate, or slightly less than
150 respondents. However, two problems were encountered during
the administration of the survey, as shown in the table below.

Table 1: **Number of Respondents**

Group	Total # Respondents	Responded and Correctly Filled Out Time -Table	Total # of Members	% People who Responded	% of People who Responded Correctly
Kappa Kappa Gamma	17	16	70	24.3%	22.9%
Tri-Beta	31	23	80	38.8%	28.8%
WESN	10	5	63	15.9%	7.9%
Circle K	20	10	30	66.7%	33.3%
Sigma Alpha Iota	17	16	48	35.4%	33.3%
Total	95	70	291	32.6%	24.1%

First, there were fewer respondents than expected, and this poses a
problem because there is a very large confidence interval for a
small number of respondents and, consequently, it will be hard to
verify the data supplied is valid even if it is significant. This prob-
lem was partly solved by increasing the number of groups to five,
so the total number of respondents was ninety-four giving a confi-
dence interval of just under ten-percent. In addition, rather than
choosing to show a strong correlation or significance between the
World Values Survey indicators and the Gross and Rayner indica-
tors, the variance between the two indicators was measured,
because no matter what significance or correlation was given, it
would not matter much due to the low number of respondents. The
second problem was a varying number of respondents from each of
the groups did not indicate the number of members from the group
they performed each activity with, and this poses a problem
because frequency and scope scores cannot be determined for these
respondents. Therefore, these respondents were only used to deter-
mine the correlation between the groups and their grid and group
scores; they were not used in determining the variance between the
World Values Survey indicators and the Gross and Rayner indica-
tors, because their responses did not take part in figuring the
group's Gross and Rayner scores.

The first hypothesis is that there should be less than 0.1[19] variance between the Gross and Rayner scores[20] and the World Values Survey scores. The variance is determined by subtracting the Gross and Rayner score for each group from the World Values Survey score for each individual.[21] These individual variances were then averaged to give an average variance for each group's grid and group score. The average variance for each group is given in the table below:

Table 2: **Statistical Variance for Each Group**[1]

Group	Grid Variance	Group Variance
Kappa Kappa Gamma	-0.11	-0.20
Tri-Beta	-0.14	0.05
WESN	-0.38	0.23
Circle-K	-0.20	0.12
Sigma Alpha Iota	0.05	0.09

[1] The aggregate World Values Survey Scores for each group and the standard deviation of the well as a scatter-gram of the variance for the different groups is given in appendix 3.

Based on this data, there is only one group that has a grid variance less than 0.10 and two groups that have a group variance[22] less than 0.10. Therefore, at first glance, the first hypothesis seems false, because a majority of the groups' grid and group variances do not fall below the 0.10 level. However, there are two groups that a grid variance close to the 0.10 level and one group that have a group variance close to the 0.10. In addition, the WESN group appears to be an outlier, because they have a grid variance of -0.38 and a group variance of 0.23, which are both much higher than any other groups variances. Therefore, if we eliminate the outlier, there is only one group that does not fall below or come close the 0.10 level for grid variance and one group that does not fall below or come close to the 0.10 level for group variance. Furthermore, if we take the average of the absolute value of the variances, not including the outlier,

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[19] This number is based on a 5% margin of error in both the World Values Survey Indicators and the Gross and Rayner indicators to give a total of 10% margin of error, or 0.10, in both measures together. In addition, the confidence interval for 95 respondents is about 10%.

[20] The scores for all the Gross and Rayner indicators as well as the Gross and Rayner score for grid and group is given in appendix 2.

[21] The formula used for determining the variance is given in appendix 3.

[22] WESN is probably an outlier due the small number of respondents being used to determine this variance. There were only five usable respondents, and this means only 7.9% of the group is represented by these numbers.

we get an average grid variance of 0.12 and an average group variance of 0.11. Both of these numbers are very close to the threshold level of 0.10 percent. From this data, it can be determined group seems to be a slightly more valid measure than grid, because it has two rather than just one group that falls below the threshold level and its average variance is lower than grid's average variance. In addition, both indicators seem to be measuring what they are supposed to or something very close. Therefore, since the threshold level was chosen ambiguously based on an assumed margin of error and the indicators seem to be measuring something closely resembling what they are supposed to and the confidence interval is slightly higher than expected, this data does not negate hypothesis one or the World Values Survey indicators.

The second hypothesis says that there should be a relatively strong correlation between the grid scores for members of the same group and the group scores for members of the same group. Based on this hypothesis, we would expect high group correlations for "group/grid score" and "group/group score" below, and we would expect the correlation for primary member[23] to be stronger than non-primary members. In the table below, the correlation coefficients Eta and Cramer's V are used to show correlation.

Table 3: **Correlations Between Group and Grid/Group[1]**

Correlation	Eta	Cramer's V
Group/Grid Score	0.547	0.568
Group/Grid Score (Primary Members)	0.709	0.731
Group/Grid Score (Non Primary Members)	0.562	0.783
Group/Group Score	0.446	0.353*
Group/Group Score (Primary Members)	0.633	0.564**
Group/Group Score (Non Primary Members)	0.457	0.192

* Significant at the .05 level
** Significant at the 0.01 level

[1] New members were also controlled for in a separate cross-tabs using the respondents answers to question nine in appendix one. It would be expected that new members would show a weaker correlation for their grid and group scores than older members, but both Eta and Cramer's V showed new members to have a stronger correlation for their grid and group scores than older members. However, this does not necessarily mean the hypothesis is false, because it can be inferred from Douglas's theory that people join a group because of the cultural bias they already have.

[23] Primary group members are those that answered "yes" to question number eight in appendix 1.

The correlation coefficient Eta shows the correlation between nominal and interval data[24] , so for the variables used to determine Eta were the individual grid and group scores for the World Values Survey and the group the individual belonged to. The data pattern suggested by the hypothesis is supported by Eta. The correlation between the grid score and members of the same group is 0.547, which is pretty strong, and this increases to 0.709 for primary members and 0.562 for non primary members. The correlation between group score and members of the same group is 0.446, which is strong but not as strong as grid, and this increases to 0.633 for primary members and 0.457 for non primary members. Therefore, the correlations given with Eta support the second hypothesis.

The correlation coefficient Cramer's V show the correlation two sets of nominal data, so for this measure, the grid and group scores for the World Values Survey Indicators were broken down into high and low categories.[25] Consequently, for this measure, the data looses some of its preciseness, but the bonus is that the significance of the measure can be determined. The data pattern suggested by the hypothesis is supported by Cramer's V, but it is much more ambiguous. The correlation between grid scores of members of the same group is 0.568 and the correlation between group scores of members of the same group is 0.353; however, the group scores correlation is significant and the grid scores correlation is not. In addition, the correlation for grid scores for primary members is 0.731 and non primary members is 0.783, and the correlation for group scores for primary members is 0.564 and for non primary members is 0.192; further, the only significant score is the group scores for primary members. Therefore, according to Cramer's V, the group indicators support hypothesis two, because the correlations for group scores for all members and primary members are significant and strong, as is implied by the hypothesis. However, the grid indicators give ambiguous results, because although the correlations are strong, the non primary members show a stronger correlation than primary members and none of them are significant. Overall, for both the Eta and Cramer's V, the data for the group indicators strongly supports hypothesis two, and the data for the grid indicators, although somewhat more ambiguous, supports hypothesis two as well.

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[24] Even though the World Values Survey indicators provide ordinal data, the nature of the data allows Eta to be used as a correlation coefficient.

[25] High grid and group are all values between 0.51 and 1.00. Low grid and group are all values between 0.00 and 0.50.

The third hypothesis is that there should not be a strong correlation between the grid and group indicators. Spearman's Rho was used to test this correlation, because it tests the correlation between two ordinal measures. The Rho value for the World Values Survey indicators for grid and group was -0.254 and it was significant at the 0.01 level. The hypothesis implies that there should not be a significant correlation, but if there is one, it should be small. A Rho of -0.254 is relatively small, but a little higher than would be expected. However, this does not negate the third hypothesis, because since the correlation is so small, it is probably a result of the limited size and location of the population tested. Therefore, hypothesis is not disproved.

Conclusion

Based on the results above, none of the hypotheses are rebutted by the data provided. There are problems and ambiguities in the data for all the hypotheses. However, since none of them were shown false and the general data trend supports the fact that these indicators are valid, the World Values Survey indicators should be able to be validly used as indicators of grid and group in future research with grid/group analysis. These indicators will undoubtedly be shown as quite useful in doing large scale studies using grid and group. Two future research experiments that new indicators could be used for seem particularly interesting and important: mapping cultural change over time throughout countries to find trends and possibly predict future change and trying to show how rational choice, institutionalist, and culturalist theories together make a powerful tool for explaining how individual's make decisions.

However, one must be careful trying to use these indicators for future research. The data gathered should be used to determine percent of the different typologies within a country and not just that a country is mostly a particular typology. The intricate workings of grid/group analysis in everyday cultural interactions are highly dependent on the interaction between groups, not just that mostly one group is present in a society.[26]

[26] Douglas and Ney say, "A culture builds its legitimacy on its own foundation of certainties that contradict the certainties of each of the other cultures…The theory now assumes that in any community all four kinds of culture are potentially present, usually actualized, and in continual conflict" (Douglas and Ney 1998: 104). Based on this quote it is apparent that for grid/group analysis to work correctly all the cultures are present interacting and shaping each other constantly.

Therefore, these indicators can be used to test the spread of the different typologies throughout a society, but not just that a society is mostly of one culture or another, due the importance of the interaction between cultures. However, if used correctly, these indicators should work as an indicator of grid and group, and hopefully, help future researchers further establish grid/group analysis as a powerful tool in individual's decision making.

Appendix 1: Culture Survey (coded)

Purpose:

This survey is for Political Science 415 and is an attempt to measure the culture of various groups on campus. No one will be able to transfer your answers on this survey to you. However, the researcher will know that you were chosen to respond to this survey based on your participation in [this group][1]. Since this survey is designed to test the culture of the group, the way you can best represent [this group] is to fill out the sections below as thoroughly and truthfully as possible. The first section is composed of a time grid where you will be asked to list your daily activities, and the second section is composed of 13 questions covering a wide range of topics; the entire survey should take approximately 10-15 minutes. Thank you for your participation.

Section 1: Time Allocation[2]

Please complete the grid below with the activities you perform during each day of the week. There are two important things to keep in mind while filling out this section. First, the activities that you write in the grid below should represent the activities that you do on a **NORMAL** week during **THIS** semester. For example, if you are going to the football game this Saturday from 12-3 but you normally study from 12-1:30 and do laundry from 1:30-3, you should write in that you study on Saturday afternoons from 12-1:30 and do laundry from 1:30-3. Second, you should include **ALL** the activities you perform during your average week, including sleeping, studying, going to class, all activities associated with ALL the organizations you participate in, parties you attend, watching TV, eating, [this group] activities, etc. In addition to simply completing the grid, would you please indicate how many members of [this group] attend each of these activities with you, 0 if none, 1 if one, etc and A if this is an activity for the entire group. For example, if you study Political Science 101 with two members of [this group] on Saturday afternoons from 12-1:30, attend Political Science 101 class with the same two individuals from 1-1:50 on Monday, Wednesday, and Fridays, eat lunch by yourself before class each of these days, and have a meeting with [this group] from 1:30-2:00 on Saturday where all members are supposed to attend, you would fill out the grid as follows.

Example Table

Time	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
12:00 PM							
12:30 PM		Lunch-0		Lunch-0		Lunch-0	Studying-2
1:00 PM		PSCI 101-2		PSCI 101-2		PSCI 101-2	↓
1:30 PM		↓		↓		↓	↓
2:00 AM							Meeting-A

---

[1] In the survey that was administered, "[this group]" was replaced with the name of the group the individuals were being surveyed for being a member of, i.e. Circle K, Tri-Beta, Kappa Kappa Gamma, or WESN, or Sigma Alpha Iota.
[2] Formulas for the frequency and scope scores are given on the last page.

Section 2: **Survey Questions**[3]

Please answer the following questions to the best of your ability

1. Now I'd like you to tell me your views on various issues. How would you place your views on this
    scale? 1 means you agree completely with the statement on the left, 10 means you agree completely
    with the statement on the right, or you can choose any number in between.

a.	1	2	3	4	5	6	7	8	9	10

Individuals should take
more responsibility for
providing for themselves

The state should take more
responsibility to ensure that
everyone is provided for

Group Score

+0	+1	+2	+3	+4	+5	+6	+7	+8	+9

b.	1	2	3	4	5	6	7	8	9	10

In the long run, hard
work usually brings a better
life

Success is more a matter of
luck or connections rather
than hard work[4]

Group Score

+0	+1	+2	+3	+4	+5	+6	+7	+8	+9

c.	1	2	3	4	5	6	7	8	9	10

Given scarce resources,
people can only accumulate
wealth at the expense of others[5]

Wealth can grow so there's
enough for everyone

Group Score

+9	+8	+7	+6	+5	+4	+3	+2	+1	+0

2. Some people feel they have completely free choice and control over their lives, and other people feel
    that what they do has no real effect on what happens to them. Please us the scale to indicate how much
    freedom of choice and control you feel you have over the way your life turns out.

1	2	3	4	5	6	7	8	9	10

None at all

A Great Deal

Grid Score

+9	+8	+7	+6	+5	+4	+3	+2	+1	+0

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[3] Questions one through six are originally from the 1990 wave of the World Values Survey code book.
Any changes made to these questions and the reasons for these changes are denoted by footnotes in the
questions.
[4] This statement was originally written "Hard work doesn't generally bring success – it's more a matter of
luck and connections. It was changed, because the original was seen as too extreme to be applicable to our
society.
[5] Originally, this statement read as follows: "people can only accumulate wealth at the expense of others."
The phrase "given scarce resources was added," because it made the statement more applicable to our
society.

3. Here are some different forms of political action that people can take. Please circle, whether you have
    actually done any of these, whether you might do it, or would never, under any circumstances do it[6].

    a. Sign a Petition   have done   might do   would never do

    b. Join in boycotts   have done   might do   would never do

    c. Attending a lawful demonstration   have done   might do   would never do

    d. Engage in civil disobedience[7]   have done   might do   would never do

    e. Occupying building or structures   have done   might do   would never do
    Group Score
    For answers of "have done," "a" adds +1, "b" adds +2, "c" adds +3, "d" adds +4, and "e" adds +5.
    For answers of "might do," "a"-"e" all add +1
    Grid Score
    For answers of "would never do," "a" adds +5, "b" adds +4, "c" adds +3, "d" adds +2, and "e"
    adds +1.

4. Now I want to ask you some questions about your outlook on life. Each question contains two
    contrasting statements[8]. Using the scale listed, could you tell me where you place your own view? 1
    means you agree completely with the statement on the left, 10 means you agree completely with the
    statement on the right, or you can choose any number in between.

    a. 1   2   3   4   5   6   7   8   9   10
        One should be careful[9] about   You will never achieve much
        Making major changes in life   unless you act boldly
        Grid Score
        +9   +8   +7   +6   +5   +4   +3   +2   +1   +0

    b. 1   2   3   4   5   6   7   8   9   10
        Ideas that have stood the test   New Ideas are generally
        Of time are generally best   better than old ones
        Group Score
        +9   +8   +7   +6   +5   +4   +3   +2   +1   +0

---

[6] On the world values survey, this question read as follows, "Now I'd like you to look at this card. I'm
going to read out some different forms of political action that people can take, and I'd like you to tell me
for each one, whether you have actually done any of these things, whether you might do it, or would never,
under any circumstance do it." It was changed to make it applicable to this survey, because the surveyor
was not showing the respondent a card.

[7] In the original survey, this phrase was written, 'joining unofficial strikes." This statement was changed to
make it more applicable to our society, but at the same time, keep the level of political action the same
strength.

[8] This sentenced was phrased, "Each card I show you has two contrasting statements on it," on the World
Values suvey. It was changed to what is says about, because the surveyor was not showing the respondent
a card.

[9] On the World Values Survey, this phrase was written "one should be cautious about making major
changes in life. It was replaced to sound less strong, because of a worry about biasing respondents.

5. If someone said that individuals should have the chance to enjoy complete sexual freedom without being restricted, would you tend to agree or disagree?

		Grid Score
a.	tend to agree	+0
b.	neither/it depends	+3
c.	tend to disagree	+9

6. How proud are you to be a member of [this group]?
   a. very proud
   b. quite proud
   c. not very proud
   d. not at all proud

7. Please circle whether you strongly agree, agree, disagree, strongly agree, or are neutral   with the following statement:

   Each member who wants a leadership position within [this group] has an equal chance at attaining that position.

Strongly Agree Entitlement[10]	Agree	Neutral	Disagree	Strongly Disagree
+0	+0.2	+0.5	+0.8	+1.0

8. Do you consider [this group] the primary group you participate in on campus?
   a. yes
   b. no

9. Are you a new member of [this group]?
   a. yes
   b. no

10. Do you have any leadership roles in [this group]?
    a. yes
    b. no
    -If yes,   what is the title of the role(s)_____

                   how did you attain the role(s)_____

Total Possible Grid Points- 42 points
Total Possible Group Points-51 points

World Values Survey Indicator Scores[11]

Grid Score=Grid Score/Total Possible Grid Points

Group Score=Group Score/Total Possible Group Score

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[10] This is one-third of the entitlement score for the Gross and Rayner indicators; see appendix 2 for equation.
[11] The aggregate world values survey scores are simply the average world values survey scores of all the members of the group.

Gross and Rayner's Frequency and Scope Scores[12]

Frequency = Total # of Hours Spent with the Group[13] / (Total # Hours in a Week - Sleep Time)

Scope = Total # of Group Activities[14] / Total # of Activities

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[12] Both frequency and scope are determined on a per week basis, and sleep is not counted as allocable time or an allocable activity.

[13] Hours spent with the group are the number of hours spent doing each activity that has a number greater than zero or an A next to it in the timetable above.

[14] Group activities are those activities that have a number greater than zero or an A next to them in the timetable above.

Appendix 2: Interview Questions (Scored)

1. How many members are in your group?
   Kappa Kappa Gamma-   70
   Tri-Beta-   80
   Circle K-   30
   WESN-   63
   Sigma Alpha Iota-   48

2. How many people attempted to join your group at the beginning of this semester?
   Kappa Kappa Gamma-   110
   Tri-Beta-   30
   Circle K-   45
   WESN-   73
   Sigma Alpha Iota-   15

3. Of these people who wanted to join, how many of them are now active members of your group?
   Kappa Kappa Gamma-   22
   Tri-Beta-   27
   Circle K-   23
   WESN-   63
   Sigma Alpha Iota-   13

4. Of the individuals who wanted to join, were any of them ineligible? If so, how many?
   Kappa Kappa Gamma-   none
   Tri-Beta-   none
   Circle K-   none
   WESN-   none
   Sigma Alpha Iota-   2

5. How many different committees does your group have?
   Kappa Kappa Gamma-   16
   Tri-Beta-   1
   Circle K-   3
   WESN-   0
   Sigma Alpha Iota-   10

6. How many people are on each committee?
   Kappa Kappa Gamma-   all members but exec on one committee
   Tri-Beta   10
   Circle K-   3
   WESN-   N/A
   Sigma Alpha Iota-   3-4

7. How does a person become a member of a committee?
   Kappa Kappa Gamma-   assigned
   Tri-Beta-   sign-up
   Circle K-   volunteer
   WESN-   N/A
   Sigma Alpha Iota-   elected

8. Do you have an executive board? If so, how many people are on it?
   Kappa Kappa Gamma-   yes, 16
   Tri-Beta-   yes, 6
   Circle K-   yes, 5
   WESN-   yes, 16
   Sigma Alpha Iota-   yes, 10

9. How do individuals become a member of the executive board?
   Kappa Kappa Gamma-   elected
   Tri-Beta-   elected
   Circle K-   elected

WESN-   old exec. assigned-10, new exec. apply and interviewed-3
Sigma Alpha Iota-   elected

10. Are there any other "roles" a member of your group could hold that I have left out, i.e. committee chairs, executive board cabinet, liaisons to other groups on campus, etc.?

Kappa Kappa Gamma-   2
Tri-Beta-   1
Circle K-   none
WESN-   none
Sigma Alpha Iota-   none

11. If so, how are these positions attained?

Kappa Kappa Gamma-   one delegated, one elected
Tri-Beta-   elected
Circle K-   N/A
WESN-   none
Sigma Alpha Iota-   N/A

12. Based on your answers to the questions above, how many "roles" in your group can a single person hold at any one time?

Kappa Kappa Gamma-   1
Tri-Beta-   1
Circle K-   2
WESN-   1
Sigma Alpha Iota-   2

13. Finally, based on the questions I have asked above, is there any other information that you believe I might find relevant to my study?

Kappa Kappa Gamma-   none
Tri-Beta-   none
Circle K-   none
WESN-   none
Sigma Alpha Iota-   none

Gross and Rayner's Impermeability, Specialization, and Entitlement Scores:

Impermeability= $1 - $ (# of new members / # of eligible people who attempted to join)[1]

Specialization= $1 - [\sum_{i=1}^{n}$ (the # roles each person i_n holds / the maximum # of roles any individual can hold at once) / n]
where n = the total number of members

Entitlement= $[\sum_{i=1}^{n}$ (the # of ascribed roles each person i_n holds / the maximum number of roles any individual can hold at once) / n]
where n = the total number of members

Gross and Rayner Grid and Group Scores:

Grid= [Specialization + {((1/3) * Average score for question 7 from survey[2]) + ((2/3) * Entitlement)}] / 2

Group= (Impermeability + Scope + Frequency)[3] / 3

Table 1: Gross and Rayner Indicator Scores

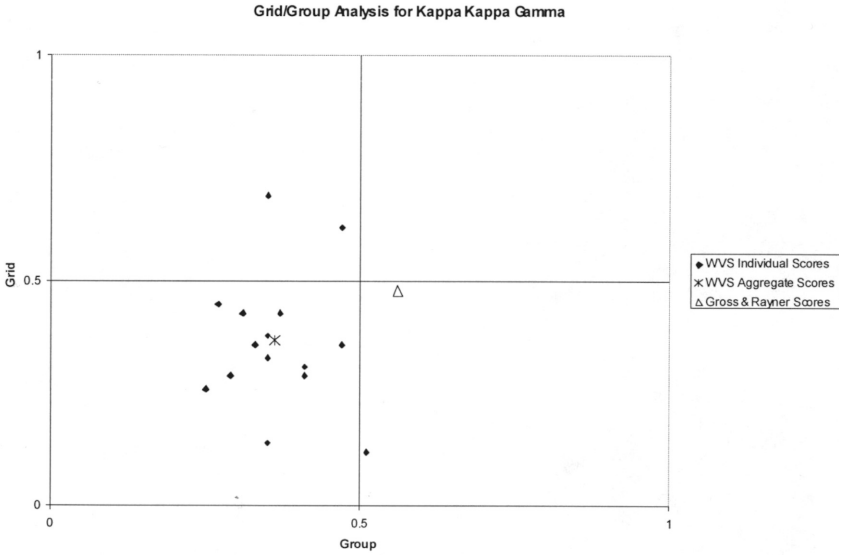| Group	Specialization	Entitlement	*Grid*	Frequency	Scope	Impermeability	*Group*
Kappa Kappa Gamma	0.39	0.57	**0.48**	0.37	0.52	0.80	**0.56**
Tri-Beta	0.79	0.15	**0.47**	0.25	0.50	0.10	**0.28**
WESN	0.79	0.29	**0.54**	0.23	0.42	0.14	**0.26**
Circle K	0.85	0.07	**0.46**	0.16	0.22	0.49	**0.29**
Sigma Alpha Iota	0.43	0.08	**0.26**	0.37	0.24	0.00	**0.31**

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[1] Since Sigma Alpha Iota had two members who were ineligible, the number of eligible members who attempted to join= the number of members who attempted to join – the number of ineligible members. For all other groups, the number of eligible members is the president of each group's answer to question two above.

[2] The following are the average entitlement scores from question seven on the survey: Kappa Kappa Gamma = 0.17, Tri-Beta = 0.44, WESN = 0.44, Circle K = 0.21, and Sigma Alpha Iota = 0.23.

[3] Scope and frequency equations are given in appendix 1.

Appendix 3: Variance: Graphically and Statiscally Shown

Figure 1:

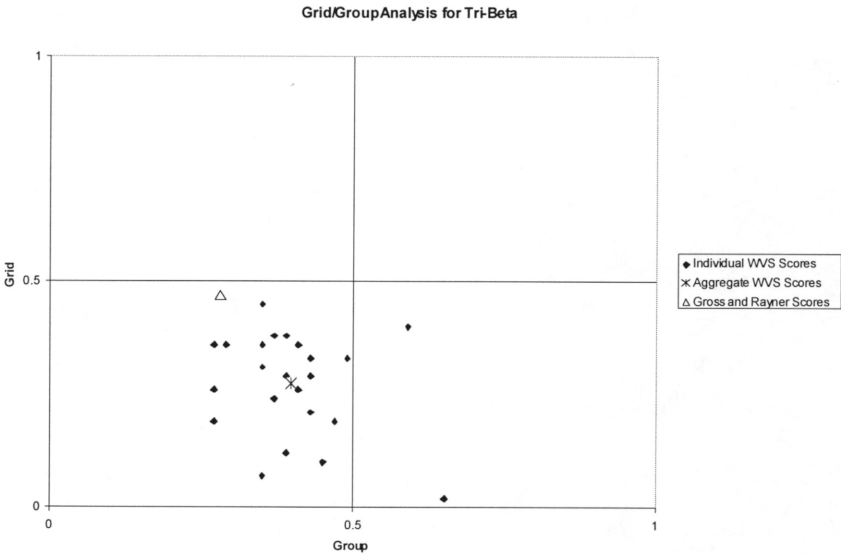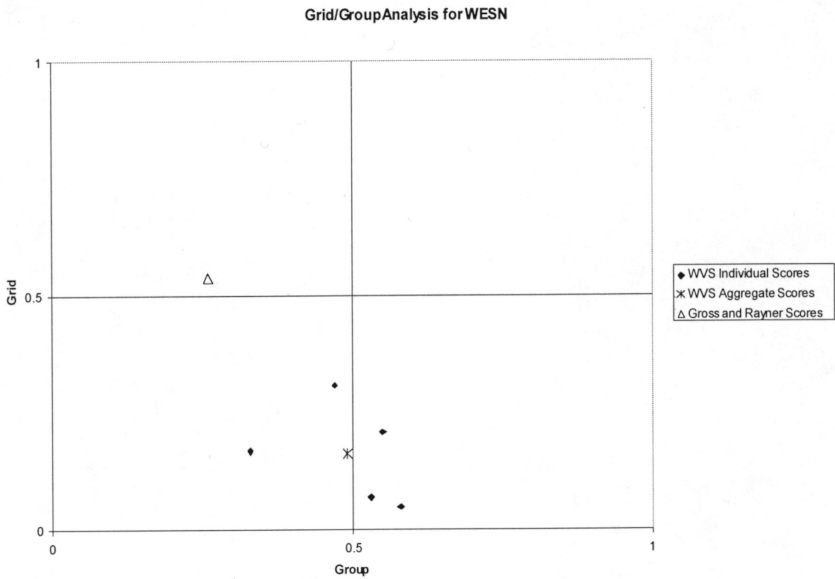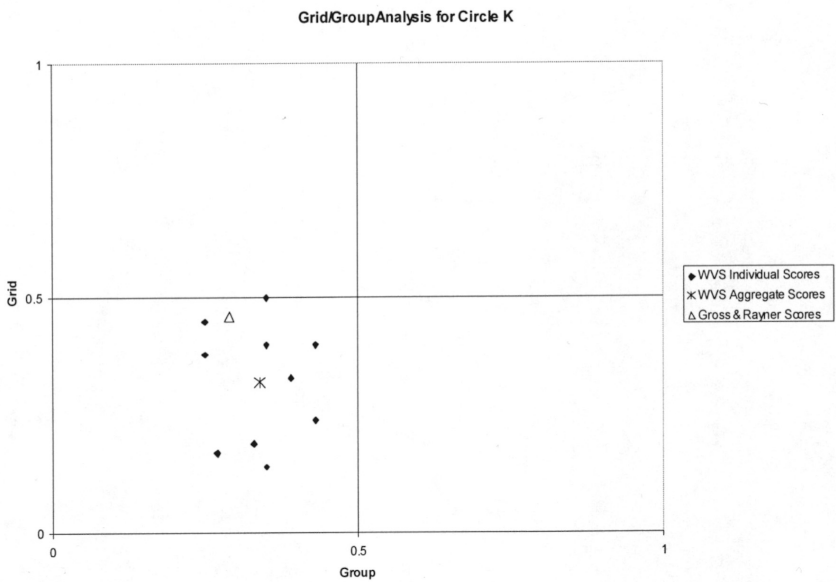Grid/Group Analysis for Kappa Kappa Gamma

Figure 2:

Grid/Group Analysis for Tri-Beta

Figure 3:

Grid/Group Analysis for WESN

Figure 4:

Grid/Group Analysis for Circle K

Figure 5:

Grid/Group Analysis for Sigma Alpha Iota
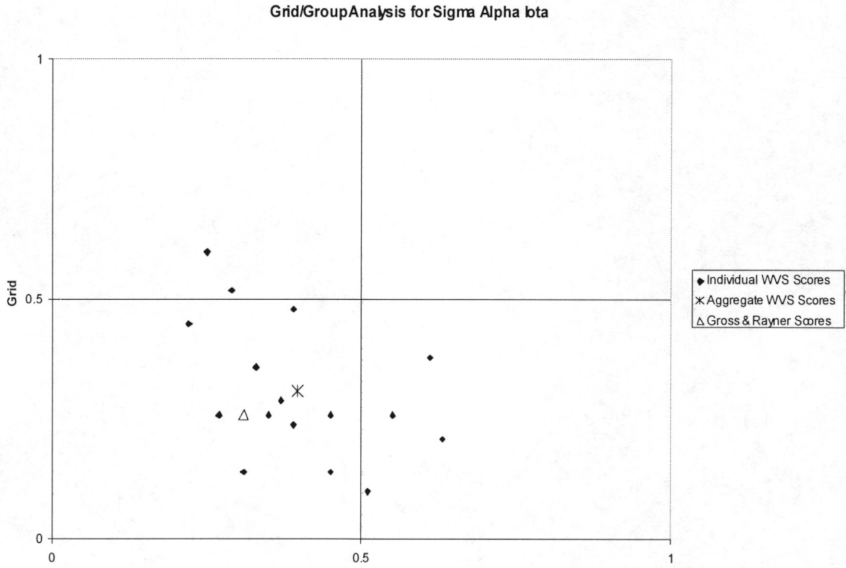
Variance:

Grid Variance= $\sum_{i=1}^{n}$ (Individual World Values Grid Score for i_n – Gross and Rayner Score) / n
where n= the total number of respondents who filled out their time-table correctly

Group Variance= $\sum_{i=1}^{n}$ (Individual World Values Group Score for i_n– Gross and Rayner Score) / n
where n= the total number of respondents who filled out their time-table correctly

Table 1: Statistical Variance for All Groups

Group	G&R Grid	Aggregate WVS Grid	G&R Group	Aggregate WVS Group	Grid Variance	Group Variance	Standard Deviation of Grid Variance	Standard Deviation of Group Variance
Kappa Kappa Gamma	0.48	0.37	0.56	0.36	-0.11	-0.20	0.148	0.074
Tri-Beta	0.46	0.32	0.29	0.34	-0.14	0.05	0.126	0.067
WESN	0.54	0.16	0.26	0.49	-0.38	0.23	0.106	0.099
Circle K	0.47	0.27	0.28	0.40	-0.20	0.12	0.114	0.093
Sigma Alpha Iota	0.26	0.31	0.31	0.40	0.05	0.09	0.144	0.126

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