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## HONORS MEMORANDUM # 3

### Research Design

The purpose of the research design is to formulate a fair test of the alternative hypotheses (including your own working propositions) and to identify appropriate empirical evidence for this. The test must be fair in that it cannot be biased in a way that favors your hypotheses over the alternatives. A research design normally specifies the following:

- a. **Operationalization of Concepts.** This is the process by which you identify empirical referents that measure the abstract concepts (the "true" variables) specified in your hypotheses. Abstract concepts seldom can be measured directly; operationalizations by definition always can be.

Please note that the word "measure" does not mean your operationalization must be a *continuous* variable like gross domestic product. It may be an *ordinal* measure of rank or even a *dichotomous* variable with only two values. (The most common dichotomous variables are "present vs. absent" and "more vs. less.") Operationalization may require that you create new measures not found in existing compendia of statistics or that you use *multiple indicators* to measure a single concept.

The ideal *operational* variable is perfectly correlated with the *true* variable (or concept) and can be measured by other researchers at a later date. That is, your operationalizations should be *valid* (measure the true variable as closely as possible), *reliable* (yield consistent values across a series of observations), and *replicable* (yield the same values for other researchers).

For example, in the example of dependency theories used in the previous memorandum, how would you measure degree of external support? A possibility might be volume of military aid given by the foreign hegemon, but you should recognize that this is only a surrogate (and possibly a flawed indicator) for the concept in your hypothesis.

That is, to measure a "true" variable (such as external support) you must develop a coding scheme or an index that permits you to classify cases with as little ambiguity as possible. In an individual case the most accurate (valid) measure might well be your "gut instinct," but this subjective measure is unacceptable because it is unlikely to yield as precise a measure for all cases (reliability) and it certainly cannot be replicated by other researchers (replicability).

A useful "reality check" when developing variables and operationalizations is the mental exercise of actually using these to code some real cases. If all your cases fall into one category or many cases simply cannot be coded unambiguously, you possibly have a bogus variable or flawed operationalization.

- b. **Case Selection.** Your choice of cases should be dictated by the research question rather than vice versa. (Of course, if your research question is derived from an empirical puzzle, your selection of cases may be constrained or even predetermined.)

Structure cases so that they present some variation. For example, if you begin with a single case, you may look for variation within this case or look for other cases that are comparable:

For example, if you begin with case study of Chumurt mobilizational strategies, one possibility is to examine variation among individual Chumurts: "what distinguishes the Chumurts who have joined class-based organizations from the Chumurts who have joined ethnic organizations?" Another possibility is to examine variation across time: "why did Chumurts mobilize on class lines until the late 1960s, but increasingly on ethnic lines since the 1970s?" Still another possibility concerns cross-national variation: "why does the

Chumurt minority in Permyakistan mobilize on class lines, but the Udvash minority in Komistan mobilize on ethnic lines?"

The *number* of cases you study will depend on the research costs of each additional case: Where you need little information about each case and that information is easily collected, you might include every case in the population. Where you need more information or that information is harder to collect, you will examine fewer cases—perhaps as few as one or two.

For example, some cross-national studies of ethnic conflict have relied on quantitative measures that are easily computed from available statistical sources such as the United Nations annuals or computerized data banks. The cases in these studies can be every independent country in the world ( $n > 150$ ) or even every country in every year between 1950 and 1990 (40 years times 150 or more countries  $> 6000$ ). Alternatively, some studies—for example, a study of the influence of internal structure of ethnic groups on their strategies—require information that can be gathered only through painstaking, close analysis. The costs of gathering information on each additional case in such studies mandate that the investigator focus on only a few cases.

Where you must select a sample of cases from the larger population, the *appropriateness* of cases will be determined by the theories you test. When selecting cases, keep in mind three considerations:

[1] Select cases that reflect variation on your independent variables.

For example, to test the hypothesis that socioeconomic development determines the longevity of military regimes, you must select at least one county at a low level of socioeconomic development and another at a high level of development. (If your proposition is that the relationship is curvilinear, with regime longevity reaching a peak at intermediate levels of development, then you would need a minimum of three cases—one each at a low level, intermediate level, and high level of socio-economic development.)

To test the competing hypotheses that socioeconomic development and external support determine the longevity of military regimes, you might use four cases (or only two cases if you select appropriately). In such tests of competing hypotheses it is often useful to go through an exercise like the following: Treating the two independent variables as dichotomous (high vs. low), there are four possible combinations (high socioeconomic development plus high external support; high development plus low support; etc.). You could represent this in a simple two-by-two matrix. You may want to have one case for each of the four combinations. Yet, if each new case represents very costly research, you may possibly trim your cases to two: In two of these combinations the hypotheses are likely to predict similar outcomes—for example, both low socioeconomic development and high external support might predict high longevity, similarly both high development and low support might predict low longevity. The cases you select for your study should be those in which your competing hypotheses predict different outcomes—that is, one case involving high development and high support and a second case involving low development and low support.

[2] Hold constant excluded factors that might contaminate your results. The cases you select may differ from one another on many other dimensions apart from the independent variables that interest you and these "excluded" variables (the variables not taken into account in your analysis) could be the real reason your cases vary on the dependent variable. You should select cases so as to "hold constant" or "control for" the most obvious alternative causes.

An example: You select an Arab state as a country with high socioeconomic development and a Latin American state as a country with low socioeconomic development in order to explain longevity of military regimes. You find that, as expected, the regime in the country with low socioeconomic development survived longer than the other. Your hypothesis is confirmed! A cultural theorist might object that you have failed to hold constant the important effects of political culture on the survival of military regimes: the real reason for the difference in regime longevity in the two cases is differences in the orientation toward authority in Arab and Latin American cultures. To "control for" these other effects, you should have selected two countries that are alike on all dimensions except the one that interests you. (Note that you can sometimes achieve the same type of control by examining the same country at two different points in time, if the country has changed relative to the explanatory variable that interests you.)

[3] Do not select cases in a manner that is correlated with the dependent variable.

The most common example of this is the study that attempts to identify the causes of some phenomenon and then examines only instances where that phenomenon has occurred. For example, a flawed study of the causes of ethnic conflict might select only countries that have experienced severe ethnic conflict. This study selects its cases in a manner that is correlated with the dependent variable and includes no cases "where the dog didn't bark."

Perhaps even more important is a closely related admonition: Beware of selecting only cases that you know conform to the pattern you hypothesize in your working proposition.

A well-designed research project that selects for variation on the *independent* variables does not guarantee variation in the *dependent* variable, but does select cases with the *a priori* expectation of such variation.

- c. ***Types of Evidence.*** Your research design should identify the types of evidence you will need to collect in order to measure the operational variables and run your “tests.” The list of possible sources is extensive. It might include statistical sources, secondary sources such as monographic histories, memoirs, newspapers, government documents, public opinion surveys, and interviews. Very successful studies in political science have used each of these types of evidence; the test of good evidence is once again appropriateness. In selecting evidence you must make a reality test when it comes to cost and availability. You must also be concerned about reliability and bias in sources.

In sum, your research design should include each of these choices—operationalizations, cases, and evidence. You should justify each of these choices in order to convince the reader that you have designed a good test of the competing theories and hypotheses.