King, Keohane and Verba, Designing Social Inquiry, pp. 3-9, 36-46, 115-149 notes for Comparative Politics Field Seminar, Fall, 1998.

(pp. 1-9) King, Keohane and Verba's (from now on KKV) primary goal is to instruct social scientists in how to design research that produces valid scientific inferences. They hope to be useful both for quantitative and qualitative research. These two types of research, they argue, are substantively the same and only differ in the types of techniques the employ. Both are seeking scientific insights into social phenomena, and both require rigorous scientific method to insure such results. To this end, they will offer not specific research techniques, but an abstract formal model of scientific methods and the elements of scientific research that will be applicable to all sorts of research.

KKV identify 4 basic characteristics of scientific research. (1) The goal of scientific research is to generate inferences. Good research is designed to make descriptive or explanatory inferences on the basis of empirical information, however these inferences must go beyond the observed data to infer something general about the world. (2) The procedures of good research are public. Good research designs have explicit, codified, public methods that are used to generate and analyze data. This is essential so that others can replicate or at least assess the research. All researchers have some form of analytic procedure that must be identified and explained to the consumer of the research. Claiming a personal relationship to the material which others do not have makes all claims untestable and is not science. (3)The conclusions in good scientific research are uncertain, and as such, all research must include an estimate of uncertainty. Our inferences are imperfect because they come from imperfect data. The social sciences deal with high levels of complexity and are probabilistic. Thus, good research must include a recognition of and some form of estimation of uncertainty. (4) The content of good scientific research is the method. The methods and rules of our research are the real content. Although we use them to study particular substantive areas, they can be used to study virtually anything. Thus, the real "stuff" of scientific research is the method.

(pp. 36-46) KKV contrast interpretation and inference. Interpretation seeks accurate summaries of historical detail. It further tries to put events in historical context such that the meaning of actions become explicable. Interpretation leans heavily on the idea of verstehen, that is empathy and "understanding" of the events that unfold. KKV hold that the most important contribution of interpretation type scholars is the emphasis on knowing historical and cultural details before forming research questions.

KKV also find problems with this method. Historical review and case studies are useful, they argue, when they are used to help design specific research questions or to generate hypotheses that can then be tested. Simple verstehen is not sufficient because it depends on the purely personal insights of the researcher and is consequently not testable. They advocate inference instead.

In the inference approach one examines evidence in order to find generalizable explanations of social phenomena. One cannot, according to KKV, use explanations of an event which claim that it is a singularly unique event that can only be explained by the full range of historical, cultural, political, etc. factors that led to it. Such a claim is, of course, true for every event. Social scientists ought to attempt to cull key phenomena and inferences from events and abstract them from the mass effects. The essence, then, of all social science is simplification. Social scientists simplify social phenomena in order to test for general causal mechanisms that are at work in many cases.

(115-149) KKV define unit homogeneity and conditional independence. Unit homogeneity holds that if the value on the key independent variables are equal in two observations, then we should expect that the value of the dependent variable will be the same in each observation. Conditional independence holds that observations are chosen and values are assigned to the independent variables in a way that is independent of the values of the dependent variables. If neither of these conditions is met then it is difficult to draw causal inferences. However, causal inference is impossible if a research design is indeterminate. Factors that can lead to an indeterminate research design include: (1) having a greater number of inferences that implications observed; (2) having 2 or more independent variables which are correlated with each other, this is also called multicollinearity. They offer three possible solutions to indeterminate research design: (1) refocusing the research on effects of particular independent variables across a range of state actions rather than on the causes of a particular set of effects. This is done by finding additional implications of one's set of independent variables thus expanding the number of observations one is using. (2) Adding a new set of observations measured at a different level of analysis. For example, if one did a

case study of a particular country on some topic, one might look to see if that same phenomena occurs at the state or local level and try to find additional observations in that manner. (3) KKV suggest that we seek to limit the number of independent variables we use. This is another way of them arguing for simplification. They argue that if we try to explain overly complex phenomena with too many independent variables we are doomed to indeterminance. The goal, they say, is to explain "a lot with a little."

KKV continue by analyzing types of bias in research designs. They begin by critiquing random selection of observations. Random selection is a good technique if we have many observations (large n) because it eliminates systematic bias. However, if we have few observations (small n) then random selection is a bad technique. When using a small n sample we must use techniques for selecting our cases in order to get a good sample.

KKV go on to discuss types of selection bias. They argue that it is essential to have variation in our dependent variable in order to avoid selection bias. That is, in studying the causes of war, we cannot only study cases in which war occurred. Sampling on the dependent variable is a common mistake which leads to selection bias. This is particularly true when using the historical record, because it is usually the case that only the times when interesting phenomena take place get recorded in the historical record. Sampling on the dependent variable tends to lead us to underestimate the causal effect of our independent variable. Another form of selection bias is when there is a varying causal effect over observations and our selection rule is correlated with the size of the causal effect. This type of selection bias introduces overestimation.

KKV then give instructions on how to intentionally select observations when we have a small n study. It is important to select for variation on the independent variable, selecting on the independent variable does not introduce bias and is the most preferred technique. If selecting on the dependent variable one must ignore values in the independent variables when selecting cases. If one has a study in which one suspects very small causal effects but there are very few cases in which the dependent variable takes on one of the values one may need to select both on the independent and dependent variable. One should first attempt to obtain more observations or select on the extremes of the independent variable. If this does not work use a technique that selects primarily on the independent variable but insures the presence of some of the rare-value dependent variables cases. This will minimize bias but not eliminate it.

Summary for KKV, pp. 168-169, 176-182, 185-187

Overview;

These fragments from KKV take up three tasks:
1)Identifying the conditions under which omitted variables do not introduce bias into the estimates
2)Provide illustrative examples of omitted variable bias; and
3)Illustrate the problem of endogeneity in causal inference.

1.What are the conditions under which omitted variables do not bias estimates of the effects of causal variables, either in quantitative or qualitative research? (pp.168-9)

KKV identify two conditions. The first is when the variable that is omitted has no effect upon the dependent variable. For instance, an analyst who wants to explain the effect of campaign spending on the proportion of the votes received by the candidate is safe to ignore whether or not that candidate is an incumbent if incumbency has no effect on the amount of votes a candidate receives.

The second condition under which omitted variables do not bias estimates is when the omitted variable "is uncorrelated with the included explanatory variable" (p.169). If an omitted variable is uncorrelated with the main explanatory variables, including those new variables in the model would not change our estimates of the effects of the main explanatory variables.

2.Illustrative examples of omitted variable bias (pp.176-182).

In this section, KKV provide three illustrative examples: 1)the relationship between education and political participation; 2)the impact of summit meetings on U.S.-Soviet cooperation; and 3)the puzzle of why the U.S.

continued to pursue free trade policies during the 1970s when it, under very similar conditions, turned to protectionism in the 1920s. The first example provides an illustration of how results may be interpreted once omitted variable have been added to the model; the second example shows how the effect of omitted variables may be inferred in the case of qualitative studies; and the third example delineates how omitted variable bias may be addressed when N is small.

First, KKV take up the question of whether there is a causal relationship between education and political participation, and if so, how. KKV introduce two control variables which may be correlated with the independent variable (education): political involvement of the individual's parents and race. KKV concede that once these control variables have been included in the model, the relationship between education and participation may diminish or disappear. However, they argue that if this happens, this does not necessarily mean that education is irrelevant; rather, it may indicate how education and the two control variables interact to affect participation. For instance, "Race might affect political participation through education. Racial discrimination might reduce the access of blacks to education. Education might, in turn, be the main factor leading to participation" (pp. 176-177).

While the political involvement of the individual's parents and the race of the individual are control variables which are antecedent to education, it is also possible to introduce control variables which are simultaneous with education of which follow it. Possible examples include the general intelligence level of the individual or exposure to civics courses. Here again, if the introduction of these variables reduce the relationship between education and participation, this does not mean that education is irrelevant, but will indicate how these variables interact with education to produce increased political participation. Here the authors emphasize that because the range of possible variables which may be included is boundless, it is important to start with a theoretical model in mind.

According to KKV, this is very much true of quantitative as well as qualitative research. As an example of the latter type of research, KKV use the puzzle of explaining why cooperation between the U.S. and the Soviet Union was higher in years following a summit than years which preceded summits. One may wish to consider antecedent variables so as to argue that the factors which are related to the likelihood of a summit meeting are also the direct causes of cooperation. Such variables may include: the level of confidence between the leaders of the two countries and domestic constraints upon the geopolitical ambitions of the two countries. A possible hypothesis may run thus: "When the superpower leaders have confidence in one another, they call a summit to reinforce that mutual confidence. This, in turn, leads to cooperation" (p.178). Here, "Confidence and summits interact to create cooperation" (p.178).

Controlling for omitted variable bias is much more difficult when the number of observations is limited. On the one hand, including too many control variables may easily make the research design indeterminate. On the other hand, omitting relevant variables introduces bias.

However, with careful methodological design, it is not possible to surmount this problem. According to KKV, a notable recent example in this regard is Helen Milner's "Resisting Protectionism." In this book, she sought to explain why, under very similar circumstances, the U.S. turned to protectionism in the 1920s, while it continued to pursue free-trade policies during the 1970s. Her hypothesis was that higher levels of economic interdependence during the 1970s affected the preferences of firms and industries and led to the more open trade policies of the 1970s. Because she only had two observations, she studied various U.S. industries during the 1920s and the 1970s, as well as a number of French industries during the 1970s.

In this study, Milner faced several problems of omitted variable bias. First, because the most significant variable affecting the degree of trade policy openness is the degree of competition from imports, Milner needed to control for this variable. If the degree of trade policy openness is correlated with her key explanatory variables (multinational investment and export dependence), her results would be biased. Milner addressed this problem by including in her study only those industries that were severely affected by foreign competition.

Two other possible sources of omitted variable bias were 1)changes in U.S. power between the 1970s; and 2)changes in the domestic political processes could the 1970s could account for the differences in the trade policy orientations over the two periods. While Milner partially controlled for the first factor by research design (the U.S.' share of world trade was roughly comparable during the 1920s and 1970s), she did not fully incorporate the difference that while the U.S. remained isolationist during the 1920s, it had become a hegemonic leader by the

1970s. Milner was more successful in eliminating the possibility for bias in the latter case. On the one hand, she compared industries and firms within the 1920s and within the 1970s; on the other, she compared the trade policy preferences of U.S. industries in the 1970s with French industries in the 1970s and concluded that the "causal effect of export dependence on trade policy preferences did not vary with changes in domestic political processes" (p.180).

Milner failed, however, to deal with several other sources of possible omitted variable bias. She did not examine the impact of "public opinion, ideology, organized labor, domestic political structure, and other possible factors" (p.181), all of which may possibly be correlated with her explanatory variables.

3.The problem of endogeneity (pp.185-187).

Endogeneity is the problem that "the values our explanatory variables take on are sometimes a consequence, rather than a cause, of our dependent variable" (p.185). This problem often arises in political science because political science is "rarely experimental" (p.185); that is, "We do not usually have the opportunity to manipulate the explanatory variables" (p.185).

An illustrative example is provided by the literature on incumbency advantage. Scholars have argued that the increasing rise in incumbency advantage since the late 1960s is due to the increase in constituency service by members of Congress. Paradoxically, the numerous statistical analyses of this hypotheses have yielded few positive results. KKV argue that this result can be explained primarily by endogeneity; that is, "members at highest risk of losing the next election… do extra constituency service. Incumbents who feel secure about being reelected probably focus on other aspects of their jobs, such as policy-making in Washington. The result is that those incumbents who do the most service receive the fewest votes" (p.186). Of course, this does not mean that more constituency service reduces votes; rather, that strong candidates perform lower levels of constituency service. Ignoring endogeneity will strongly bias one's inferences.

This is the summary of KKV 189-193 and 208-228.

Short:

My part of the readings is divided into one very small part on endogeneity and a larger section on how to increase the number of observations. The endogeneity part suggests two ways of solving this problem: 1) transforming endogeneity into an omitted variable problem, to be solved by measuring new variables, and 2) selecting observations to avoid endogeneity, by choosing variables that predict different values on the suspect variable and the dependent variable. The "increase n" part starts with a criticism of Eckstein's "crucial" case studies and of reasoning by analogy. Then, KKV suggest three ways of increasing the number of observations: 1) measuring the same variables for new units, 2) measuring new variables for the same units, and 3) measuring new variables for new units.

Long:

5.4 Endogeneity This section deals with two ways of dealing with the problem of endogeneity. First, it can be transformed into an omitted variable problem. The example is Weimar Germany, where the PR system was said to cause the instability that led to the fall of the regime. Here, the omitted variable is prior social fragmentation, which can explain both the electoral system and its fall. The PR system is thus endogenous, and the original causal relationship spurious.

A related, second way to avoid endogeneity is to select observations that can determine whether the causal relationship is spurious or not. The example is the role of ideas in the spread of Stalinist planning doctrine. The relationship could be spurious if Soviet occupation could be found alongside the doctrine. However, by choosing countries with Stalinist doctrine but without Soviet troops (China, Yugoslavia) one can demonstrate that ideas are probably not endogenous in this case.

6. INCREASING THE NUMBER OF OBSERVATIONS

6.1 Single-observation designs for causal inference. The chapter begins by criticizing Eckstein's single-case methodology. Aside from the obvious degrees-of-freedom problem, there are three pitfalls when having only one observation: 1) alternative explanations, which makes it impossible to tell which of two hypothesized causes is the correct one, 2) measurement error, which will not be reined in by other cases, and 3) determinism (or lack thereof), that is, we cannot know if our observation is due to chance or not.

Reasoning by analogy is a special case of the single-case study. This is because the analogy uses a single observation to predict another, whereas the comparative approach uses a weighted combination of a large number of other observations. The latter should therefore be preferred. Further, even a single case may have several observations in it, so there is no excuse.

6.2 How many observations are enough? The answer to this question depends on four things: 1) noise level in the world, 2) how much uncertainty we accept, 3) collinearity between the causal and control variables, and 4) how much the causal variable varies (the more it varies, the fewer observations do we need). The higher the levels of noise, or fundamental variability, the more observations are needed. This is because it is more difficult to find clear signals when values vary much. Likewise, a less efficient estimator requires more observations.

The more precise results we need, the more observations are required. This should be fairly obvious, as the standard error declines when the number of observations increases. As King says, "more data is always better"!

Collinearity between the causal and the control variables may compel us to use more observations. The classic King example is the store where all white employees are female and all black employees are male. To establish the effects of race or gender, we need to find black females and/or white males.

Finally, the variance of the values of the causal explanatory variable matters for the number of observations matters. The more this variable varies, the more we can know with a fixed number of observations. Thus, we can concentrate on choosing observations with a wide range of values on the key causal variable. When observing the effects of GDP on political stability, for example, it makes more sense to compare, say, Liberia and Canada than Denmark and Sweden.

6.3 Making many observations from few

The standard way to do this is to measure what one has measured previously, but from new units. One can also study sub-units, such as counties or municipalities, or states in federal systems. Non-territorial possibilities are various government agencies, churches, and other organizations. The same unit can also be studied over time. There might be a danger, however, that the observations are not independent. For example, political participation in one county may not be independent from that in a neighboring county. This does not mean that data from additional counties does not help the analysis, but that one has to proceed with caution.

Instead of including more observations by looking at additional cases, one can look at different measures of the same units. This implies changing the dependent variable. One should ask: If what we assume is correct, what else would be the case? For example, Putnam (1993) uses twelve indicators to measure democratic performance in Italian regions.

Finally, one can use both new measures and new units. This implies the creation of essentially new hypotheses, but hypotheses that are derived from the original ones. Process tracing is one example of this: Instead of treating a single outcome as one dependent variable, one can look at events at different stages of the decision-making process, thus creating many observations.