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Undergraduate Aspirations: A Test of Several Theories

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Two significant sociological theories which have been invoked in research about undergraduate aspirations are tested. The data, based on a national sample of students, contain some key measurements which had been missing from previous studies as well as a series of additional control variables. In general, relative-deprivation theory receives strong support; environmental-press theory receives equivocal support. However, the results vary as a function of the particular kind of aspiration under consideration. These findings support the contention that a complete theoretical model should allow for the simultaneous operation of *both* theories in a complex pattern rather than forcing a choice between the two.

The study of the educational and professional aspirations of college students is an area of social research which combines potential pragmatic impact with a chance to test some relatively abstract theories. With the recent increase in the number of extensive data banks based on digital computing facilities, researchers have been able to study undergraduate career choice on a national basis with large samples. This is in contrast with a previous, more limited approach which rested on the hope that national estimates could be extrapolated, for example, from a survey of the graduating seniors of one small college. Recent research on undergraduate career choice using nationally representative samples has included studies of the initial preferences of entering freshmen (Drew 1970*b*; Staff of the Office of Research 1970), factors associated with changes in career patterns during the undergraduate years (Astin and Panos 1969; Davis 1965), and the aspirations of graduating seniors (Davis 1964; Sharp and Krasnegor 1966). Special commissions charged with making national manpower recommendations have drawn upon the results of research such as this in their work (e.g., Folger, Astin, and Bayer 1970).

Concurrently the study of undergraduate aspirations has been fertile ground for the development and testing of a series of sociological theories

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and models which have included the theory of relative deprivation (Davis 1966), environmental-press theory (Thistlethwaite and Wheeler 1966), and a conceptual model based on path analysis (Werts 1968). James Davis began this theoretical exchange in his now classic "frog pond" article in which he applied the theory of relative deprivation, first elaborated by Samuel Stouffer in his studies of the American soldier (Stouffer et al. 1949), in a special analysis of the aspirations of college seniors based on NORC data. Within a reference-group framework, Davis argued that undergraduate career choice is a function of self-esteem or "academic self-concept," which, in turn, is based in part on the students assessment of his performance relative to that of his peers. Davis reasoned that the significant reference group for an undergraduate consists of the other students in his own school, not the national pool of undergraduates. To support this hypothesis he reported data showing that the graduating senior's career choice is more highly related to his college grade point average (a local measure of performance) than to school quality (a measure which reflects the national distribution), once his initial freshman career choice and aptitude are controlled. Unfortunately, Davis was forced to work with rather limited measures of both school quality and scholastic aptitude. A crucial problem was lack of a direct measure of academic self-concept. As a replacement for this he used an approximation to the notion based on a questionnaire item which read, "I have a flair for course work in this area." Davis concluded that being a big frog in a small pond has a more positive effect on aspirations than being a small frog in a big pond.

A different school of thought is represented by the environmental-press theorists who argue that student achievement and aspirations are a function of the social context. Basically this theory differs from relative-deprivation theory in the role that it assigns to college quality or selectivity. According to relative-deprivation theory, selectivity should have a negative effect on aspirations because it has a negative effect on academic achievement (i.e., a given student will have a harder time getting good grades at a highly selective college). Environmental-press theory, on the other hand, maintains that selectivity should positively affect aspirations, since an undergraduate will perform best and aim highest at a school where most of his fellow students have high aspirations and are superior academically. Werts and Watley (1969), using a multiple regression model with a national sample of undergraduates to test the relative predictive power of the two theories, reported findings which tended to support relative deprivation theory; but they, too, lamented their crucial missing link—a measure of academic self-concept.

With this work as a background we undertook the research reported below with multiple objectives. We shared a conviction that neither of the above theories was sufficiently extensive to account fully for the phe-

nomena under study. Rather, we felt we might be able to explicate these models by exploring the *conditions under which* they will or will not operate. A basic assumption underlying our empirical analyses was that these middle-range theories belong in a conceptual framework within the context of reference-group theory.

In addition, there is evidence that the various degrees (bachelor's, master's, professional, doctorate, etc.) cannot be ordered easily into a single "level of aspiration" continuum, since changes over time in undergraduate degree plans are highly asymetrical (that is, there appears to be no way that the various degrees can be ordered to produce a homoscedastic plot between initial and followup degree plans) (Astin 1962), and since aspirations for different degrees are predictable from quite different sets of independent variables (Astin and Penos 1969). Consequently, in this study we augmented the unitary measure of "level of aspiration" with separate measures of aspirations for specific degrees (Ph.D., professional, etc.).

Reference-group theory, of course, has been invoked to explain undergraduate phenomena beyond that of career aspirations (e.g., Drew 1969). In addition, it has been shown that what appear to be college effects can vanish when the input characteristics of the student body are controlled (Astin 1968*b*). A complete analysis of student-body or reference-group impact requires that all possible control variables be considered. Thus, even though Davis controlled initial freshman choice and scholastic aptitude and Werts and Watley added father's education, enough longitudinal research on student aspirations has accumulated to indicate that several additional control variables should be considered (see, for example, Astin 1971; Astin and Panos 1969). Thus, we attempted to control simultaneously a rather lengthy list of variables.

Our goal was to test these theories with relatively recent longitudinal data (the most recent information used in the Davis and Werts-Watley studies was gathered in 1962) and with several critical variables that had been missing in previous analyses. To meet this need, we drew upon the higher education data bank that has been developed through the longitudinal research program of the American Council on Education.

RESEARCH METHODS

The analyses presented in this report are a direct product of the Cooperative Institutional Research Program (CIRP) being conducted by the Office of Research of the American Council on Education. Since this program was launched in 1966, over a million undergraduates have completed questionnaires. Preliminary work prior to the CIRP program included a prototype study carried out with students who entered college in 1961 and

a pilot study of 1965 freshmen. Each fall since 1966, when the full-scale program was launched, approximately a quarter of a million students from a wide range of colleges and universities have filled out questionnaires containing items about their previous academic experiences, educational and professional aspirations, attitudes, self-concepts, etc. In addition follow-up questionnaires have been sent to subsamples of each entering cohort at periodic intervals.

This framework makes possible both descriptive profiles and longitudinal studies of undergraduate development. National normative reports have been produced with respect to entering freshmen (e.g., Staff of the Office of Research 1970) and at subsequent intervals in the college experience (Bayer et al. 1970), as well as with respect to specific subgroups of students (e.g., Drew 1970*a*). Analytical studies have been conducted about such topics as the dimensions of the college environment (Astin 1968*a*).

Testing these alternative theoretical notions required that measures be made both at the time the student entered college and at least at one subsequent point in time. This would allow study of the intricate relationships among aptitude, initial self-concept, college selectivity, academic performance, follow-up self-concept, and both initial and follow-up level of aspiration. Our data were obtained from the cohort which entered college in 1966, and which received a follow-up in August 1967.

The follow-up sample of 60,000 students was composed of 300 students randomly selected from larger colleges and all students in the original sample who were from schools with a freshman class numbering fewer than 300. Valid responses were received from 34,693 subjects at 246 institutions. These schools were diverse, representing the full range from extremely selective to unselective. When this information was matched with data provided by university registrars (scores on college admissions tests and the student's academic record during the freshman year), the sample size was reduced to 22,079. To reduce costs, one-fifth of these students ($N = 4{,}415$) were randomly selected to constitute the final sample for analysis.

Operational definitions of the various theoretical constructs were based on items from the initial form completed by the student as an entering freshman, from the follow-up questionnaire, and from the data on freshmen grades and test scores provided by the registrars. Additional variables that had been shown to be significantly related to undergraduate academic performance and aspirations were incorporated as control variables.

The specific statistical techniques employed below were carefully selected to provide a proper test of the theoretical models. We chose to rely on comparison of partial correlations in which the additional significant input variables acted as controls. These controls were selected by stepwise linear

multiple regression analysis. This methodology parallels that used by Davis except that it is a parametric technique, whereas he relied strictly on a nonparametric approach.[2] In the equations reported below, the independent variables included not only academic ability, college grade point average, selectivity, and initial and follow-up self-concept but also the series of additional control variables. However, while the pool of independent variables used in each analysis exceeded fifty items, only those variables that contributed significantly ($P < .05$) to the prediction of the dependent variable are presented.

The Principal Independent Variables

The measure of environmental-press theory used in these analyses was college selectivity, an estimate of the average academic ability of the students who enroll at the college (Astin 1971). Among other things selectivity has been found to be a good index of the perceived academic quality of the institution (Astin 1970*a*).

The student's concept of his academic ability ("ability self-concept") was assessed by means of his rating the trait "academic ability" on a five-point scale: highest 10 percent, above average, average, below average, lowest 10 percent. Students were asked to rate separately this and several other traits according to the following instruction: "Rate yourself on each of the following traits as *you really think you are* when compared with the average student of your own age. We want the most accurate estimate of *how you see yourself*."

The student's freshman grades (GPA), as reported by the institution, were converted to a common scale ($A = 4, \ldots, F = 0$) in order to eliminate variations of grading systems. Since these were direct grade-for-grade conversions, differences among institutions in the distribution of these "common" GPAs remained (however, see n. 6).

RESULTS

Effects of College Selectivity on Grades

Relative-deprivation theory maintains that college selectivity affects the

[2] Several differences between this research and the original Davis study should be noted. His subjects were college seniors, whereas our sample consisted of sophomores and deliberately was constructed to include students who might have dropped out of college since participating in the research as entering freshmen. This latter group would certainly represent a relevant extreme with respect to the relationship between college grades and aspirations; furthermore, as shown in the work of Eckland (1964) and others, many of these students ultimately will graduate from college and may go on to graduate work. Finally, the specific criterion variable in the Davis study was future occupational field, which was interpreted as a reflection of level of aspiration, whereas the present study used a more direct measure of educational aspirations.

student's aspirations indirectly via its effects on academic performance. At least two recent studies (Astin 1970*b*, 1970*c*) documented the negative effect of college selectivity on students' GPA. Since our own analysis of this effect simply replicated the earlier findings, we shall not report the results in detail here. Suffice it to say that a given student is less likely to obtain high grades at a highly selective college than at an unselective one; that is, the partial correlation between college grades and selectivity (while controlling for all significant input predictors of grades) was —.224.

Prediction of Ability Self-Concept

A crucial theoretical link in the theory of relative deprivation is the student's concept of his academic ability ("ability self-concept"). As we had measures of this variable from both the freshman and the follow-up questionnaires, we first carried out a preliminary analysis involving only this measure as a dependent variable. The stepwise regression algorithm was used to isolate all entering freshman characteristics that significantly predicted the follow-up self-rating. These predictors then were used as control variables in computing the partial correlations of college selectivity and freshman grades with the criterion. Table 1 summarizes the results from this analysis. The *F*-values can be interpreted as reflecting the

TABLE 1

PREDICTION OF FOLLOW-UP ACADEMIC ABILITY SELF-RATING
(MULTIPLE $R = .640$, $N = 4{,}415$ STUDENTS)

INDEPENDENT VARIABLE	FINAL EQUATION: Sign of Coefficient	FINAL EQUATION: *F*-Value	ZERO-ORDER CORRELATION
Initial ability self-rating	+	495.473*	.588*
Scholastic aptitude	+	187.501*	.539*
High school grades	+	55.617*	.449*
National merit recognition	+	10.954*	.323*
Published poem, story, etc.	+	8.499*	.143*
Presently have no religion	+	7.308*	.120*
Age	+	5.174*	—.075*
Sex (male)	+	4.809*	.062*
Father's education	+	4.494*	.156*

	Partial Correlation with the Criterion	Zero-Order Correlation
College selectivity[a]	.007	.332*
Common grade point average[b]	.257*	.450*

[a] Independent of variables listed above and common grade point average.
[b] Independent of variables listed above and college selectivity.
* Statistically significant ($P < .05$).

reduction in residual sum of squares in the criterion that is uniquely associated with each variable (i.e., the amount of predictive power that would be lost if that variable were deleted from the equation).

As expected, the best predictor of the student's ability self-concept after one year of college is his ability self-concept at the time of matriculation. Students whose ability self-concepts tend to remain relatively high during the first year of college are those who are male, bright, have no religious preference, performed well in secondary school, etc. The other variables clearly support the position of relative-deprivation theory. The theory predicts that the partial correlation between college grades and self-concept will be positive and that the partial correlation between selectivity and self-concept will be zero or insignificant; both predictions are confirmed by these results. Thus, selectivity does not appear to directly influence ability self-concept independent of college grades. Strong support has been given to one aspect of relative-deprivation theory: academic performance in college, as reflected in the student's grade point average (a local measure), is positively related to ability self-concept independent of prior academic achievement, ability, and selectivity.

Prediction of Level of Aspiration

A preliminary test of the two theories is provided by comparing the partial correlations of selectivity and college grade point average with aspirations while controlling for the other significant input predictors of aspirations. The first criterion measure used was a five-point scale based on the following item:

> What is the highest academic degree that you intend to obtain?
>
> None
> Associate (or equivalent)
> Bachelor's degree (B.A., B.S., etc.)
> Master's degree (M.A., M.S., etc.)
> Ph.D. or Ed.D.
> M.D., D.D.S., or D.V.M.
> LL.B. or J.D.
> B.D.
> Other

The five scores resulting from the coding of this variable were: 1 (none), 2 (associate), 3 (bachelor's), 4 (master's), 5 (all others).

As in the first analysis, a stepwise regression algorithm was used to isolate all input characteristics that significantly predicted follow-up aspirations. These predictors then were used as control variables in computing the two partial correlations involving college selectivity and GPA. These control variables and the significant predictors of the other criteria

TABLE 2

FRESHMEN CHARACTERISTICS WHICH WERE SIGNIFICANT PREDICTORS OF EACH CRITERION
($N = 4{,}415$ STUDENTS)

INDEPENDENT VARIABLE	SIGN OF COEFFICIENT	FOLLOW-UP CRITERION VARIABLE			
		Overall Level Of Aspiration	Doctorate	Professional Degree	Graduate School
Sex (male)	+	X	X	X	X
Scholastic aptitude	+	X	X	...	X
Black	+	X	X	...	X
Reared as a protestant	−	X	...	...	...
Presently have no religion	+	...	X	...	...
Father's education	+	...	...	X	...
Mother's education	+	X	...	...	...
High school grades	+	X	...	X	X
High school accomplishments:					
National merit recognition	+	X	X	...	...
NSF summer program participant	+	...	X	...	...
Participated in state debate contest	+	X	...	...	X
Edited school paper, etc.	+	...	...	...	X
Published poem, story, etc.	+	...	X	...	...
Drank beer in high school	−	...	X	...	...
Initial freshman aspirations:					
Overall aspiration level	+	X	...	...	...
Doctorate	+	...	X	...	...
Professional degree	+	...	...	X	...
Graduate school	+	...	...	...	X
Multiple R		.613	.563	.627	.587

(below) are presented in table 2. As can be seen in table 2, nine input characteristics significantly predicted the overall measure of follow-up level of aspiration.

As expected, both the initial level of aspiration and sex are important predictors of the criterion. In addition, students whose aspiration levels remained relatively high in the follow-up tended to be black, bright, and so forth.

As before, the crucial test involves comparison of the partials of selectivity and college grades while controlling for these variables and initial ability self-concept. An examination of these statistics as reported in table 3 clearly supports relative-deprivation theory. The partial correlation between level of aspiration and grades is .097 as compared with a partial correlation for selectivity of .041. It should be noted, however, that the partial r for selectivity is positive and statistically significant. More about this later.

TABLE 3

PARTIAL CORRELATIONS BETWEEN EACH FOLLOW-UP ASPIRATION MEASURE AND BOTH SELECTIVITY AND COLLEGE GRADES ($N = 4{,}415$ STUDENTS)

CRITERION	CONTROL VARIABLES		
	Input Characteristics Only[a]	Input Characteristics[a] plus Follow-up Self-Rating	Input Characteristics,[a] Follow-up Self-Rating, and College Grades
Overall level of aspiration:			
College selectivity	.041*	.046*	.066*
Common grade point average ..	.097*	.076*	...
Doctorate:			
College selectivity	.030*	.032*	.037*
Common grade point average ..	.039*	.021	...
Professional degree:			
College selectivity	.016	.014	.020
Common grade point average ..	.045*	.035*	...
Graduate degree:			
College selectivity	.010	.014	.035*
Common grade point average ..	.100*	.083*	...

[a] Including initial ability self-rating.
* Statistically significant ($P < .05$).

In proposing future research, Davis has suggested that "one strategy would be . . . [to] show that when subjective success is controlled the differential vanishes. That is, if our interpretation is correct, feelings of success should explain the GPA versus school quality differential" (Davis 1966, p. 25).

In the next phase of our analysis we *added* to the equation the measure of follow-up ability self-concept. Examination of the new partials when this followup self-concept is included as a control variable indicates that the effect of college grades has not vanished. Thus, while self-concept (and relative-deprivation theory) explains *some* of the importance (as reflected in the rather large decrease in the partial for grades), GPA has an effect above and beyond this relationship.

Prediction of Specific Degree Plans

We next carried out a series of analyses in which the student's more specific educational objectives were examined separately. This involved recoding the original level of aspiration variable into a set of dichotomous variables, each reflecting a different aspiration. The next analysis was one in which the dependent variable was whether the student planned to get a graduate degree. As can be seen in table 3, while the findings are similar to those for the overall measure of aspirations, the effect of selectivity clearly is *not* significant.

The next regression analysis was one in which the dependent variable was aspirations toward a doctorate (Ph.D. or Ed.D.) as reported in the follow-up questionnaire. This appears to be a classic illustration of relative-deprivation theory. College grades significantly predict the criterion before the follow-up ability self-concept is introduced but lose impact after that. Note, however, that once again the effect of selectivity is significant and that these partial correlations are, after all, rather small.[3]

Our final analysis was concerned with follow-up plans for a professional degree.[4] The results essentially are the same as those obtained with respect to plans to obtain a graduate degree.

It can be argued in a logical analysis of these causal chains that a partial correlation between aspirations and selectivity while controlling for input and self-concept is not the most direct measure of the effects of environmental press. That is, the use of this partial correlation assumes that grades do not directly affect aspirations. Since our preliminary findings revealed that grades can affect aspirations directly, we carried out an

[3] This fact should be underscored in light of the standard methodological concerns about the reliability and validity of variables, particularly measures such as academic ability self-concept. A recent, unpublished study by Creager and Boruch has indicated that the test-retest reliability for this measure exceeds .8. Thus, while the issue of reliability is not as serious as it might be, this factor could attenuate the correlations reported here and should be considered in interpretations of these findings.

[4] Bear in mind that the group of students who do not seek a professional degree includes some who aspire to a Ph.D., Ed.D., etc. Consequently this dichotomy is less clear-cut than the others. However, we felt these results would be informative and a useful test of the theoretical models.

additional test to measure environmental press. This was to calculate the partial correlation between selectivity and aspirations while controlling for input, follow-up self-concept, *and* college grades; the results from this analysis are included in table 3. As can be seen, the effects of selectivity found here parallel those discussed above. The only major difference between the two sets of results is that the new calculations indicate that there is a significant positive effect of selectivity with respect to aspirations to get a graduate degree.

In short, these several regression analyses show that academic achievement is significantly related to each form of aspiration when student input characteristics are controlled. Further control of the student's follow-up self-concept reduces the apparent effect of achievement on aspirations, thereby demonstrating the presence of relative deprivation theory in several instances. The most striking illustration of this effect occurs with respect to aspirations toward a Ph.D. or Ed.D.[5] Since the effect of college selectivity sometimes is a significant factor, sometimes not, environmental-press theory receives equivocal support from the data. Selectivity, however, never has a negative impact on aspirations.[6]

DISCUSSION AND CONCLUSIONS

The ability of relative-deprivation theory to account for our empirical findings varies depending upon precisely which kind of educational aspirations are being considered. However, it seems clear from this research and that of the relative-deprivation theorists from Stouffer on that there is a dynamic which can be identified and labeled relative deprivation. Similarly, a strong case can be made for the effects of selectivity or environmental press. Previous investigators who have forced a choice between the two theories have been creating a straw man.

[5] Relative-deprivation theory requires that the partial correlation between aspirations and self-concept (while controlling for input characteristics, college grades, and selectivity) be positive. In the case of three of the four aspiration measures this partial correlation was significant and positive. The partial correlation with respect to aspirations toward a professional degree (.027) was positive and approached significance. This finding, plus the other evidence, indicates that the operation of relative deprivation theory generally seems to be weakest with respect to aspirations toward a professional degree—a result which may simply reflect the definition problems discussed in n. 4.

[6] We also created a supplementary measure of academic performance: the "standardized grade point average," in which the grade distributions for students at each institution were converted to a scale with a mean of 500 and a standard deviation of 100. Relative-deprivation theory, which emphasizes local comparison so strongly, would predict that the effects of this variable on aspirations should match or exceed the effects of the common GPA measure. We included the standardized GPA in each test and found that, typically, its effect was in the same direction as that of the common GPA but less pronounced. This finding is further evidence of our contention that

Some investigators who have dealt with this problem have found it convenient to summarize their results in terms of a somewhat contrived anecdotal scene. Typically, it is presented as a situation in which a guidance counselor or parent is faced with the choice of whether to send a graduating senior to a very selective school or to an unselective school. The question is: From which school would the same student graduate with the highest aspirations? According to Werts and Watley, relative-deprivation theory argues in favor of the less selective school. However, we feel that a closer reading of the empirical results would appear to lead to precisely the opposite recommendation. While it is true that selectivity affects grades negatively and that relative-deprivation theory does operate (an undergraduate's aspirations are a function of his college grades and his academic self-concept), environmental-press theory appears to be operating simultaneously. Note that the unique contribution of selectivity to aspirations always is positive and often is significant. Thus, when the important factors are controlled, the data favor the more selective rather than the less selective school. Simply demonstrating that relative deprivation operates does not, in other words, justify jumping to the conclusion that students should be sent to a less selective school, since selectivity apparently affects aspirations directly in addition to its indirect effect via GPA. The two theories are not mutually exclusive; they both appear to be operating in a complex pattern—but if there is any simple answer in the anecdotal situation it is to send the student to the *more* selective school.

It is clear that environmental press and relative deprivation can both pull in the same direction (for example, in the case of the student who finds himself well above the mean at a selective school) but also can conflict.

Once the situational variations with respect to these forces are more clearly understood, the implications for decision making by the student and his counselors should be clear. It may be, for example, that the optimal strategy for the student in the anecdotal choice situation would be to attend the most selective college at which he still expects to perform better than the average undergraduate. However, future research should reveal whether a student must simply exceed the mean or be, say, a full standard deviation above the mean in order to feel the effects of relative deprivation. As a further complication, there may be individual differences here such that the threshold at which a student feels like a big frog in

GPA affects aspirations above and beyond the indirect impact via self-esteem. However, the one instance in which the effect of this new variable clearly was more pronounced than that of the common GPA was the case of aspirations toward a Ph.D. or Ed.D. This finding may be a function of the importance of relative deprivation with respect to aspirations toward the doctorate.

his pond varies from person to person. Finally, interaction effects with respect to the selectivity of the school must also be outlined. That is, a student may feel the impact of relative deprivation if he simply matches or exceeds the mean at Harvard or Yale, while he may require a much greater relative performance at an unselective school.

On a theoretical level, Davis noted Kelley's (1952) distinction between the normative function of reference groups and the comparison function. Kemper (1968), in an excellent theoretical discussion of reference group impact, has distinguished analytically three forms of the reference group (normative, comparative, and audience), underscoring the fact that any concrete group may function in one, two, or all three of these ways. The situational conflicts that we postulate between relative-deprivation theory and environmental-press theory could be described as an instance in which two analytical reference-group functions (normative and comparative) of one concrete group are in conflict (as in, for example, the case of a student performing below the mean at a selective school).

A further hazard of the standard anecdotal comparison should be underscored: it concentrates on one dimension of undergraduate development while ignoring other dimensions that will be of great concern to the student himself. Choice of a college involves consideration of its effects in many areas besides that of educational aspirations.

A number of directions for future research seem clear. For the most part they take the form of specifying more elaborately the particular circumstances under which these theories operate. Thus, the dependent variable could be refined to reflect specific career orientations, for example, law, college teaching, etc. In light of the predictive importance of race and sex and of the social importance of issues concerning the education of women and blacks, it would be profitable to perform separate analyses for samples stratified by race and sex. In addition, it would be useful to focus the analyses upon smaller subenvironment domains as opposed to the entire college or university, for example, specific friendship groups.

This theoretical area tends to spawn zoological analogies. Davis summarized relative-deprivation theory in terms of a frog pond metaphor, while the environmental-press theorists advocate the "birds of a feather" theory. In comparing these two models, however, we have concluded that this can of worms is a horse of a different color.

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