Race and Shared Belief as Factors in Social Choice

In real-life experiments, congeniality of ideas proves to be a stronger determinant than race.

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Several recent studies support the hypothesis that differences in belief on important issues are a more powerful determinant of prejudice or discrimination than differences in race or ethnic membership. White college students in the North and South (*1–3*) and white teen-agers in California (*4*) have been found in questionnaire-type studies to prefer Negroes with beliefs, values, and personalities perceived to be similar to their own (for example, a Negro who believes in God) to whites with beliefs, values, and personalities perceived to be dissimilar to their own (for example, a white atheist). More generally, these subjects are observed to rate less favorably those, regardless of race, whose belief systems are incongruent with their own than those, regardless of race, whose belief systems are congruent with their own. Rokeach, Smith, and Evans (*1*) have reported comparable results with Jewish children; the children of their study rated gentiles whose belief systems were seen as congruent with their own (for example, a gentile who is for Israel) more favorably than they did Jews whose belief systems were seen as incongruent with their own (a Jew who is against Israel). Stein (*5*) has recently reported confirmatory results in studies of Negro, Jewish, and gentile teen-agers in a Northeastern city, as has Martin (*6*) in a study of the differential preferences of English Canadians for English Canadians, French Canadians, and Canadian Indians of varied beliefs (*7*).

Generalization from these findings is, however, severely limited by the fact that in all these studies the social stimuli were "paper-and-pencil" stimuli and the discriminatory responses elicited were "paper-and-pencil" responses. To overcome this limitation, we conducted three experiments in which subjects were given the opportunity to discriminate on the basis of race or belief, or both, in real-life situations. These experiments are all alike in basic design. A naive subject engages four strangers, confederates of the experimenter, in a group discussion about an important or situationally relevant topic. Two of the confederates are white and two are Negro. One white and one Negro agree with the subject, and one white and one Negro disagree with him. The subject is then asked to state a preference for two of the four confederates.

In two of the experiments, conducted on a university campus, the subject chose two of the confederates to join him for a coffee break. In the third experiment, which was conducted in the natural field setting of an employment office, the subjects were actually applying for jobs; each chose two of four "job applicants" he would most like to work with. This third experiment provides the strongest test of our major hypothesis. For one thing, these subjects were unemployed workers (or, occasionally, employed workers seeking to change jobs), not college students. More important, they were under the impression that the procedures to which they were subjected were an integral part of a normal interview procedure, and they were totally unaware that they were participating in an experiment—a condition that can rarely be assured with college students participating in psychological experiments.

Within the basic framework of these experiments we were interested in three additional questions:

1) *Comparison between white and Negro subjects.* The field experiment in the employment office included Negro as well as white applicants, and the results obtained from these two groups can be compared. This study was carried out during the winter of 1963–64, a period during which civil rights demonstrations and clashes provided many daily headlines. In this charged atmosphere, would Negroes and whites pick working partners along race lines, or would beliefs relevant to the working situation be a more important determinant of interpersonal choice?

2) *Comparison between subjects high and low in anti-Negro prejudice.* Rokeach, Smith, and Evans found that, "whether a person is high or low in prejudice against Jews and Negroes [as determined by scores on anti-Semitism and anti-Negro attitude scales], he responds to belief rather than racial or ethnic cues when given an opportunity to do so" (*1*, p. 155). In our two campus experiments we also studied the extent to which racial attitudes predict social choice.

3) *Comparison between public and private conditions.* If discrimination on the basis of race is institutionalized or if there exists extreme social pressure to discriminate along racial lines (as is most clearly the case in the South or in South Africa), there is virtually no likelihood that social discrimination will occur on the basis of similarity of belief. All the experiments to be reported here were conducted in the state of Michigan, where patterns of racial discrimination are less institutionalized and less subject to social pressure than they are in the South. Nevertheless, it is reasonable to assume that such pressures are far from absent in Michigan and consequently that our subjects would choose partners differently under public and private conditions. This assumption was tested in the two campus experiments.

Procedure in the Campus Experiments

Two virtually identical experiments were performed, one in 1961 with 20 white male subjects drawn from an introductory sociology class (*8*), the second in 1963–64 with 48 white male subjects drawn from an introductory psychology class. At least 10 days before the respective experiments, instructors (not the experimenters) ad-

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ministered a six-item anti-Negro Scale (*9*). "High-prejudice" subjects were defined as those who obtained plus scores and "low-prejudice" subjects as those who obtained minus scores on this scale.

The experiment was conducted in two adjacent rooms—one for receiving and interviewing the subjects, the other for group discussion—situated in an isolated wing of a campus building. To avoid suspicion, the confederates arrived separately. After all five participants had arrived, they were seated around a conference table and were told that their task was to discuss a controversial topic, to be selected from a list of five topics by their chairman, who was to be chosen by election. The topics were: (i) invasion of Cuba, (ii) elimination of fraternities from campus, (iii) allowing girls to visit men's dormitories, (iv) Bible reading in the schools, and (v) the grading system.

Each participant was first asked to introduce himself; then the subject, by prearrangement, was elected chairman. He selected the topic and then led a 15-minute discussion. One white and one Negro confederate agreed with the subject, and one white and one Negro disagreed. Identification was facilitated by printed name cards, as in TV panel shows. Personality effects on interpersonal choice were randomized by rotating the assignments of each confederate so that if he agreed with one subject he disagreed with the next. On terminating the discussion, the experimenter took the subject into the next room for a private interview. The experimenter displayed a seating chart of the participants and, under the guise of checking his written notes against the subject's judgment, asked the subject to identify the opinions expressed by the participants, thus assuring that the subject remembered their opinions as well as their names.

While the subject looked at the seating chart, the experimenter remarked that the participants would be interviewed individually and that therefore there would be enough time for several of them to take a coffee break; he then asked the subject, as chairman, to select two of the participants to join him for coffee. In half the cases the experimenter specified that they would be served coffee in a private room next door (the *private* condition), in the other half that they would go to the grill in the Student Union Building (the *public* condition), where the coffee would be paid for from research funds. After the subject made his choices he was asked how he had decided on them. The experimenter then explained the purpose of the experiment and pledged the subject to secrecy.

Procedure in the Field Experiment

The subjects in the field experiment were 26 Negro and 24 white male applicants for the positions of janitor, laundry worker, attendant, and recreational director at two mental hospitals in Michigan. The level of positions applied for was the same for Negro and white applicants. Experimental sessions were scheduled at the employment offices of the two hospitals on days when several job applicants were to appear for job interviews by prior appointment. All such applicants were included in the sample.

After an applicant had filled out the usual application form, the experimenter, posing as a staff member of the personnel office, accompanied him to a "waiting room" in which the four confederates, posing and dressed and previously trained to play their roles as job applicants, were already "waiting to be interviewed." As the experimenter and the subject entered, two confederates were looking intently at a mimeographed sheet entitled "Problems of working with mental patients," on which five topics were listed: what to do if a patient (i) misses dinner, (ii) refuses to shave because of a delusion, (iii) takes off his clothes, or (iv) asks to change his dining-room seat, and (v) what to do with juvenile offenders. In each case two specific courses of action were provided—one based on a rule, the other a more permissive alternative. The experimenter handed mimeographed sheets to the subject and to those confederates who did not already have them, explaining that "they are used in the training program" and suggesting that the applicants look at them while waiting their turns to be interviewed.

The experimenter then left the room, and the four confederates initiated a "spontaneous" discussion of at least three of the five topics. One white and one Negro confederate defended the permissive position, and one white and one Negro confederate defended the rule-oriented position. As in the campus experiments, confederates alternated positions from one applicant to another. The subject was gradually drawn into the discussion, his opinion being directly solicited if necessary. If the subject was not consistent in choosing either the rule or the permissive course of action in the several situations (and this was true of about half the subjects), the confederates tried to follow him, agreeing or disagreeing with him according to their predetermined assignments.

The experimenter returned after about 12 minutes, announcing that the interviewers were not quite ready yet. He then passed out 2 by 4 cards and asked each participant to write the names of the two people in the group whom he would most prefer to work with. Since the applicants did not yet "know" one another's names, they introduced themselves. The experimenter then assured the applicants that their choices would be kept confidential and that this part of the interview procedure was "something new and has nothing to do with your employment interview." While the subject wrote down the two preferred names, each of the other four wrote down the names of the two confederates who agreed with the subject most of the time. This was done to check on whether there had been a slip-up in carrying out the assignments. (There were none.) The experimenter then collected the cards, thanked the applicants, and left. He or the personnel assistant returned shortly afterwards to escort the subject to his real interview.

The Choices

Under the experimental conditions described, there are six possible combinations of partners among which the subject can choose:

1) S+O+: two persons who agree with him, one of each race.

2) S−O−: two persons who disagree with him, one of each race.

3) S+S−: two persons of the same race (as the subject), one agreeing, the other disagreeing with him.

4) O+O−: two persons of the other race, one agreeing, the other disagreeing.

5) S+O−: one person of his own race who agrees and a second person of the other race who disagrees.

6) S−O+: one person of his own race who disagrees and a second person of the other race who agrees.

It is reasonable to assume that the more frequently our subjects choose pattern 1 or 2 over the remaining patterns, the more probable it is that they are discriminating (that is, choosing preferentially) on the basis of belief criteria alone; the more frequently they choose pattern 3 or 4 over the remaining patterns, the more probable it is that they are discriminating on the basis of racial critera alone; and the more frequently they choose pattern 5 or 6 over the remaining patterns, the more probable that they are not choosing preferentially on the basis of either race or belief criteria alone.

It is immediately obvious from Table 1 that the six patterns do not appear equally often. This is true for each of the three experiments considered separately, and when the data from all experiments are combined we see that patterns 1 through 6 were chosen by 47, 4, 7, 7, 22, and 31 subjects, respectively.

The most direct way of assessing the relative effects of congruence of belief and congruence of race, as determinants of personal choice, is to compare the number of subjects who chose two persons of the same belief (pattern 1) with the number who chose two persons of the same race (pattern 3). Pattern 1 (S+O+) was chosen twice as often as pattern 3 (S+S–) in the campus 1961 study, four times as often in the campus 1963–64 study, and 15 times as often in the field study. When the data from all three experiments are combined, we find that pattern 1 was chosen by 47 subjects and pattern 3 by only 7—a ratio of almost 7 to 1. Under the conditions described, similarity of belief is clearly a more powerful determinant of interpersonal choice than similarity of race.

Additional support for the initial hypothesis is obtained when we compare pattern 1 with pattern 2 and pattern 3 with pattern 4. Our subjects preferred two partners who agreed with them to two partners who disagreed with them 4 to 1, 13 to 0, and 30 to 3 in the three experiments, respectively. Of the 118 subjects in the three experiments, 47 chose two partners who agreed with them and only 4 chose two partners who disagreed with them. In contrast, 7 subjects (out of 118) preferred two partners of their own race (S+S–), and 7 preferred two partners of the other race (O+O–).

Clearly, similarity of belief is a far more important basis for choosing partners than dissimilarity of belief; only 4 subjects out of 118 (instead of the 19 that would be expected by pure chance) chose two partners who disagreed with them (pattern 2). More surprising is that (i) only 14 subjects (instead of a theoretically expected 39) chose partners of one race (patterns 3 and 4), and (ii) of these 14, as many chose two partners from the other race as from their own.

Table 1. Frequency of choice of various race and belief patterns in three experiments. Each pattern consists of two partners. S, same race as subject; O, other race; +, agreed with subject; –, disagreed with subject.

Experimental group	Pattern (1) S+O+	(2) S–O–	(3) S+S–	(4) O+O–	(5) S+O–	(6) S–O+	Total
Campus 1961	4	1	2	1	3	9	20
High prejudice	2	1	2	0	2	3	10
Low prejudice	2	0	0	1	1	6	10
Private	0	0	1	0	1	8	10
Public	4	1	1	1	2	1	10
Campus 1963–64	13	0	3	3	15	14	48
High prejudice	5	0	1	2	6	7	21
Low prejudice	8	0	2	1	9	7	27
Private	7	0	1	1	8	7	24
Public	6	0	2	2	7	7	24
Field 1963–64	30	3	2	3	4	8	50
Negro	15	3	1	2	3	2	26
White	15	0	1	1	1	6	24
All groups	47	4	7	7	22	31	118

Let us consider next the findings with respect to patterns 5 and 6. A sizable proportion of our subjects—53 of the 118—chose coffee- and work-partners varying in both belief and race; 22 chose pattern 5 (S+O–) and 31 chose pattern 6 (S–O+). But with respect to these two patterns we note an important difference between the two campus studies on the one hand and the field study on the other. In each of the campus studies, 60 percent apparently preferred partners differing from one another in both race and belief. But this was so of only 24 percent of the subjects in the field study; 60 percent in the field study chose two partners with beliefs congruent with their own, one white and one Negro. It is not possible to say whether these differences are due to sampling differences between college students and workers; or to the fact that choice of coffee-partners is a "one-shot deal," while choice of work-partners has longer-range implications; or to the fact that the particular issues discussed were related to work in the one case but not in the other. Another interpretation which would seem to fit the data equally well is that while a majority of the work-applicants preferred partners with congruent beliefs (S+O+), a majority of the campus subjects preferred the mixed racial patterns 1, 5, and 6 (S+O+, S+O–, S–O+), their choices among these patterns being about evenly distributed. But this preference for SO patterns must be qualified by the fact that the campus subjects avoided pattern 2 (S–O–).

No matter how one chooses to state the differences between the subjects in the campus and field studies, it is clear that in all three experiments (i) similarity of belief is a considerably more frequent basis of choice than dissimilarity of belief; (ii) similarity of race is rarely a basis of choice—considerably less often even than chance, and no more frequently than dissimilarity of race; and (iii) similarity of belief is a considerably more frequent basis of choice than similarity of race.

In the campus 1963–64 and field studies, we obtained additional data on the order in which the two confederates were chosen. These data (Table 2) generally confirm the findings already presented. Considering first the campus 1963–64 results, note that, although a large proportion of the subjects chose a partner who disagreed as well as one who agreed, two-thirds of those who did so chose first the partner who agreed. In contrast, the first choices of all the subjects were exactly evenly divided between the two races. The comparable findings in the field study are even more decisively in favor of belief rather than race congruence as a determinant of choice. Here a much smaller proportion chose

a disagreeing as well as an agreeing partner, and three-quarters of those who did so chose the agreeing partner first. Again, these results are in sharp contrast to those concerning race. All but a few subjects chose partners of both races, and only 40 percent of them chose the partner of their own race first. These findings are quite consistent for the Negro and white subjects considered separately.

Another interesting finding shown in Table 2 is that in both studies the proportion of choices on the basis of belief congruence decreases from the first to the second choice (in the campus 1963–64 study $\chi^2 = 4.50$, $P < .05$; in the field study $\chi^2 = 3.61$, $P < .10$). No such decreases are, of course, observed with respect to race in the campus study, since the racial choices, being exactly equal on the first choice, are already balanced. But in the field study we again note a tendency to balance out the unequal racial choices as the subjects proceed from the first to the second partner. These results enable us to understand better the choice patterns shown in Table 1. It would seem as if many of the subjects, especially the campus subjects, were somehow aware of the basis on which they made their first preferential choice, and motivated by considerations of fair-mindedness they were more likely to choose a second partner possessing both belief and racial characteristics opposite to those of the first partner. At the same time the results show that more of the subjects were fair-minded about race than about belief.

Comparison between white and Negro subjects. Under the experimental conditions described, that is, when a person possesses situationally relevant information about another person's beliefs, there is little evidence indeed that he will discriminate on the basis of race per se. The question may now be raised whether Negro subjects respond any differently from white subjects when choosing others. James Baldwin, perhaps the most eloquent spokesman of the Negro people today, has insisted that white people, even well-meaning liberal white people, cannot understand the perceptions, thoughts, feelings, and desires of the Negro who lives in a white society which oppresses him from birth; as a result of lifelong oppression, the Negro's psychological processes are inevitably different from the white's. If Baldwin's contentions are correct we should find our Negro subjects choosing partners in ways which are significantly different from the ways whites choose.

Table 2. Order of choice of partners in two experiments.

Choice		No. of subjects	
First	Second	Campus study*	Field study
+	+	13	30
+	−	23	13
−	+	12	4
−	−	0	3
S	S	3	2
S	O	21	18
O	S	21	27
O	O	3	3

* 1963–64.

But the results presented in Table 1 show that in this experimental situation, at least, Negroes chose partners in ways which were indistinguishable from whites. Fifteen Negro applicants (out of 26) and 15 white applicants (out of 24) chose two partners who agreed with them, one white and one Negro. Only three of the Negro subjects and only two of the white subjects chose two partners of one race, and these were not necessarily of their own race.

Comparison between subjects high and low in prejudice. In the two campus studies the subjects had been classified before the experiment as high or low in prejudice on the basis of an anti-Negro scale. The results of both studies are essentially the same for high- and low-prejudice groups (Table 1). It would seem that scores on an anti-Negro scale are not necessarily related to real-life discrimination.

Comparison between public and private conditions. In neither campus study did privacy appear to have an effect on racial choice. In 1961, only one out of 10 subjects in the private condition and two out of 10 in the public condition chose two partners of their own race or of the other race; in 1963–64, two out of 24 in the private condition and four out of 24 in the public condition chose two partners of their own race or of the other race. If we look further at the campus 1963–64 data, it is also evident that the frequency of choice of all six patterns is remarkably similar under the public and private conditions. But certain unanticipated differences in choice patterns appear between the two conditions in the campus 1961 study. Four subjects in the public condition but none in the private condition chose pattern 1—two partners who agreed with them; eight subjects in the private condition but only one in the public condition chose pattern 6—one partner of the same race who disagreed and one of the other race who agreed with the subject. The variability of patterns chosen is generally greater for the public than for the private condition, but it makes for a difference only in the belief choices, not the racial choices. While the difference between conditions is statistically significant ($\chi^2 = 7.27$), we are nevertheless inclined to discount this difference for methodological reasons (*10*) and to conclude tentatively that the social pressures in a northern campus community were not sufficiently great to produce consistent differences between public and private choices. In this connection and in support of this interpretation it should be pointed out that the naive subjects were undoubtedly aware that they were participating in interactions with the four others, within a university context or an employment-interview context in the State of Michigan (a state which took an early lead in developing nondiscriminatory laws and policies in employment and in education). This may have been sufficient to indicate to the subjects that there existed no strong external social pressures to discriminate along racial lines. In other words, the conditions under which the studies were conducted must have suggested to the subjects that they were more or less free to choose partners in any way they wanted to.

It is conceivable, of course, that, given the social context, the subjects may have felt some external pressure *not* to discriminate along racial lines. We had no way of determining which or how many subjects may have felt such pressure. In any event, our data show little or no discrimination along racial lines; and, whether or not external pressures not to discriminate along racial lines existed, the subjects were free to choose from among the remaining five patterns.

Our main interest in studying differences in discrimination patterns under public and private conditions stems from the assumption that the crucial social-psychological difference between them is the presence or absence of social pressures to coerce discrimination along racial lines. It is interesting to speculate about the results we might have obtained had we been able to replicate our studies in the deep

South. An attempt by one of us to set up such a study in the deep South was unsuccessful, mainly because of anticipated reprisals toward research collaborators, confederates, and cooperating subjects. But had such a study proven feasible we would have predicted results considerably different from those reported here, namely, that, because of greater social pressures existing under public than under private conditions, choice of coffee- and work-partners would have been more uniformly along racial rather than belief lines.

Regarding the role of belief versus race as a determinant of discrimination, Triandis (*7*) and Stein, Hardyck, and Smith (*4*) have raised the objection that in the vast majority of social situations where discrimination is practiced (for example, in employment, education, public transportation and accommodation, and housing) white people do not stop to inquire into the beliefs of Negroes in order to determine whether they are congruent or incongruent with their own. The person discriminated against is a total stranger whose belief system is unknown to the person doing the discriminating. We have already suggested that discrimination along racial lines can be expected to occur whenever there is sufficient social pressure or when it is institutionally sanctioned. Under such conditions beliefs are irrelevant as a basis for discrimination. What should be added is that white persons in general and prejudiced white persons in particular, as a result of living within a social system in which racial discrimination is socially reinforced, come to assume that Negro strangers possess beliefs, values, and personalities dissimilar to their own. Thus, Byrne and Wong (*2*) found in a group of white subjects in Texas that those with anti-Negro prejudice more frequently than those without assumed that Negroes' beliefs are dissimilar to their own. And Stein, Hardyck, and Smith have reported that "the correlations presented . . . seem to indicate that the inference made by most subjects about a Negro teenager, in the absence of other information, is that he is *unlike* them" (*4*, p. 288).

A final point concerns the issue of equal-status social contacts. Brink and Harris's (*11*) public-opinion data show that whites who have had previous social contact with Negroes are less prejudiced and have fewer stereotypes than whites with no such contact. Many others have pointed out that racial prejudice can be overcome or eliminated if individuals get to know one another in equal-status contacts. Our studies lead to the same conclusion but with one important qualification. In the field study especially, all contacts were equal-status contacts, but not all individuals who interacted with one another had congruent beliefs. It should therefore be pointed out that the concept of "equal-status contacts" is not necessarily equivalent to the concept of "contact between individuals with congruent belief systems." And recent research by Stein (*5*) shows that the latter variable is more crucial than the former as a determinant of interpersonal choice.

Table 3. Reasons for choice in campus 1963–64 study, by pattern of choice.

Reason	Pattern					
	(1) S+O+	(2) S–O–	(3) S+S–	(4) O+O–	(5) S+O–	(6) S–O+
Quality of discussion	2	0	3	2	7	6
Race and belief	0	0	0	0	3	1
Personality	4	0	0	1	4	3
Other	7	0	0	0	1	4

Subjects' reports on reasons for choice. At the end of the campus 1963–64 study the subjects were invited to give their reasons for choosing as they did. Four types of reasons were given (Table 3). Since there were no differences between high- and low-prejudice subjects or between subjects in the public and private conditions, these breakdowns are not shown. The most frequent reason given—by 20 out of 48 subjects—was to "keep the discussion going" or some variant thereof ("interesting guys to talk with," "keep things going," "best talkers"). The majority of these 20 subjects had chosen patterns 5 and 6, combinations in which both race and belief are varied. Four additional subjects who had chosen patterns 5 and 6 said more or less explicitly that they chose one of each race and one of each belief. When asked why, they responded with such reasons as "because of my Army experience" or "I did not want to leave two Negroes" or "I picked one on color and one on belief."

A third type of reason was "Nice personality" or "I liked them." And a fourth type, which we have classified as "Other," may be interpreted as "evasive." The subject said he "didn't know" or "it didn't matter" or "I picked any two guys" or "I just picked two guys sitting next to me." It is interesting to note that 11 of the 13 subjects who chose pattern 1 (S+O+) but only 12 of the 29 who chose patterns 5 and 6 gave the third and fourth kinds of reason. This suggests that different processes underlie different choice patterns and, perhaps more important, that those who chose on the basis of belief congruence were generally more evasive about or unaware of the real reasons for their choices, possibly because choosing others on the basis of belief congruence violates religious and social ideals of tolerance toward those with opposing viewpoints.

Conclusion

Our three experiments and some of the others we have referred to (*1–6*) suggest that the importance of racial attitudes per se as determinants of racial discrimination have been greatly overestimated and the importance of congruence of beliefs correspondingly underestimated. Whatever racial attitudes our subjects may have had seem to have exerted little or no influence on actual choices in social situations where external pressures to discriminate along racial lines were slight or absent (and pressures *not* to discriminate along racial lines possibly present). One of us has speculated elsewhere (*12*) on the basis of earlier findings with paper-and-pencil tests, now reinforced by the experiments here described, that "in those actions not subject to social sanction discrimination along racial or ethnic lines would not take place, not even in the South . . . the *locus* of racial and ethnic discrimination is to be sought in society, not in the individual's psyche. If society's constraints were altogether removed . . . man would still discriminate, if discriminate he must, not in terms of race or ethnic grouping, but in accord with his basic psychological predisposition, characteristic of all human beings, to organize the world of human beings in terms

of the principle of belief congruence."

It remains to be seen whether the results of these experiments can be replicated with other kinds of subjects, in other kinds of situations, and in other kinds of cultural and subcultural contexts. And another task for future research is to explore in more detail the personal and social determinants of all the choice patterns we observed.

References and Notes

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7. The only exception to the cited findings is a study by H. C. Triandis, *J. Abnorm. Soc. Psychol.* **62**, 184 (1961). For a critique of this study see M. Rokeach, *ibid.*, p. 187, and for a reconciliation of findings see Stein *et al.* (*4*).
8. We thank Joe Smucker and Del Dyer, who conducted this experiment and analyzed the data.
9. T. W. Adorno, E. Frenkel-Brunswik, D. J. Levinson, R. N. Sanford, *The Authoritarian Personality* (Harper, New York, 1950), p. 142.
10. It is tempting to suggest that these differences are somehow due to the existence of social pressures in the campus community in 1961 and to their disappearance in 1963–64, perhaps as a result of changing social norms concerning civil rights. If this interpretation were valid we would expect to find the campus 1963–64 results under both private and public conditions looking very much like the campus 1961 results found under private conditions. But this does not appear to be the case. A more likely possibility is that the difference between public and private conditions in the campus 1961 study are, because of the small number of cases, unreliable, despite the fact that they turn out to be statistically significant. We are inclined to discount these results because we determined the significance level by first looking at the data and then combining patterns 1–5 (in order to eliminate small frequencies) and, more important, because we have not been able to replicate them.
11. W. Brink and L. Harris, *The Negro Revolution in America* (Simon and Shuster, New York, 1964).
12. M. Rokeach, *J. Abnorm. Soc. Psychol.* **62**, 187 (1961).

13. Supported by the School of Labor and Industrial Relations, Michigan State University.

Acids and Bases

Hard acids prefer to associate with hard bases, and soft acids prefer to associate with soft bases.

Ralph G. Pearson

The most important of all classes of chemical reactions is the generalized acid-base reaction (*1*):

$$A + :B \rightleftharpoons A:B \qquad (1)$$

A is a Lewis acid, or electron acceptor, and :B is a Lewis base, or electron donor; A:B is the complex formed between them by partial donation of electrons from :B to A. Examples of such complexes include coordination compounds and complex ions in which A is a metal atom or ion, most ordinary inorganic and organic molecules, charge-transfer complexes, hydrogen-bonded complexes, and complexes between free radicals (which act as acids) and various bases. When A is a metal ion, the base B is called a ligand. When the rates of reaction 1 are being discussed, A is called an electrophilic reagent and B is called a nucleophilic reagent.

Indeed one can see that very much of chemistry is included under the heading of acid-base interactions. Any generalizations that can be made about the equilibrium constants for reaction 1, or the stability of the acid-base complex, A:B, will have wide applicability. The special case where A is a metal ion has been extensively studied, and many equilibrium constants for reaction 1 are known (*2*). Actually what is usually known is the equilibrium constants for the competition reaction

$$A:B' + A':B \rightleftharpoons A:B + A':B' \qquad (2)$$

where A′ and :B′ are the common reference acid and base, H_2O.

Several earlier workers, especially Fajans (*3*) and J. Bjerrum (*4*), had noted that the metal ions fall into two categories according to the kinds of bases they prefer to coordinate with. Schwarzenbach (*5*) divided the metal ions into two classes, A and B. The most typical metal ions of class A were those of the representative elements having no *d*-orbital electrons. The class B metal ions had 8 to 10 outer *d* electrons, occurring near the end of a transition series.

The overall order of stability of class-B metal ions for various bases falls in the approximate sequence

$$S \sim C > I > Br > Cl > N > O > F$$

where the atom shown is the donor atom of the base. For class A metal ions this order is strongly inverted. Hence stable complexes in water solution can only be formed with oxygen donors and F− in many cases. For class A ions the stability of the complexes increases with increasing positive charge: $Al^{3+} > Mg^{2+} > Na^{+}$. For class B ions, the reverse is true, at least for the best donor atoms in the series. $Ag^{+} > Cd^{2+} > Au^{3+} > Sn^{4+}$.

Chatt, Ahrland, and Davies made a very useful advance (*6*) when they classified metal ions according to whether they form their most stable complexes with the first ligand atom of each group, class (a), or with the second or a subsequent member of each group, class (b). The following sequences of complex-ion stability are then found:

(a) $N >> P > As > Sb > Bi$
(b) $N << P > As > Sb > Bi$
(a) $O >> S > Se > Te$
(b) $O << S \sim Se \sim Te$
(a) $F > Cl > Br > I$
(b) $F < Cl < Br < I$

Chatt, Ahrland, and Davies' class (a) metal ions are the same as Schwarzenbach's class A, and their class (b) metal ions are the same as his class B. To avoid confusion with symbols used for Lewis acid and Lewis base, I use (a) and (b) from here on.

The rules of Ahrland, Chatt, and Davies can also be used to classify other kinds of generalized Lewis acids (*7*). Where the necessary equilibrium data are not available, other criteria may be used. One is that class (b)

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