present theory, however, Ss should be trained to respond to changes in both length and number, in order to obtain a maximally complete classification of possibilities [p. 315]." The present results are clearly in keeping with Halford's thesis that training to differentiate only the conservation-relevant cue is insufficient for the acquisition of conservation.

While the results support Halford's position, another interpretation is possible. Although the informed group performed significantly better in training than did the uninformed group, the former may not have fully differentiated the property of length. Over the last half of training, the informed group was correct on 68% of the trials. The analogous group in Gelman's study responded correctly on 94% of length-relevant trials over the last half of training. Two hypotheses are suggested by this comparison. First, a common differentiating ability may underlie performance on problems requiring discrimination and conservation of a stimulus property. While fairly reliable discrimination of a stimulus property might occur without its full differentiation, high-level discrimination performance (say, 85% correct) is coincident with conservation of the stimulus property. Second, the differentiation of stimulus properties which permits their discrimination and conservation normally develops with age.

The two hypotheses taken together imply a stimulus-oriented conception of development (E. J. Gibson, 1969). Further, these hypotheses are contrary to the widely held opinion that the conservations reflect more complex processes than do those involved in discrimination. Rather than minimizing the complexity of conservation, however, the hypotheses suggest that discrimination of a space-distributed stimulus property, such as length, is a developmental acquisition. Research testing both hypotheses is under way in our laboratory.

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realized that this result could be attributed to either the proportion of similar attitudes or the number of similar attitudes. Byrne & Nelson (1965) pursued this research by testing the hypothesis that attraction toward a stranger is a positive function of the *proportion* of positive reinforcements received by the S from the stranger. They employed a 4 by 3 factorial design, with three numbers of positive reinforcements, or similar attitudes between the Ss and the stranger (4, 8, and 16), and four levels of the proportion of positive reinforcements (1.00, .67, .50, and .33). They found, as hypothesized, that the effect due to the number of similar attitudes was nonsignificant, but the proportion effect was highly significant $(p < .001)$. Thus, proportion rather than number of similar attitudes was the effective stimulus variable in this between-groups design. Byrne & Rhamey (1965) and Byrne & Clore (in press) further refined mathematically this relationship between interpersonal attraction and proportion of positive reinforcements by including weighting factors for differentially weighted positive and negative reinforcers. The weighting factor was designed to take into consideration the effect of reinforcement magnitude.

In all of this research, between-groups designs were used. No S was required to evaluate more than one stranger. In within-groups designs, there are two ways in which Ss can evaluate more than one stranger in the course of the experiment. With a "successive"-stranger design, a S sees information about and evaluates Stranger 1 prior to receiving any information about Stranger 2, etc. In this case, the first stranger that the Ss evaluate represents a between-groups design. In a "simultaneous"-stranger design, a S receives all of the information from all of the strangers and then proceeds to evaluate the strangers individually. With this design, the S can make comparisons between the strangers and form his evaluation of each stranger on the basis of these comparisons. Obviously, Ss in a successive design can compare from memory later strangers to earlier ones. The successive-stranger design more nearly approximates the between-groups design employed in earlier work than does the simultaneous-stranger design. Thus, the results of a simultaneous-stranger design may not be totally consistent with between-groups results. Specifically, it is hypothesized that when only the number of similar attitudes is varied, in a simultaneous-stranger design, attraction toward the several strangers is a positive function of the number of attitudes. In a successive-stranger design,

The effect on interpersonal attraction of successive and simultaneous presentation of strangers

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The experiment was designed to compare two within-Ss designs with the between-groups design generally used in Byrne's interpersonal attraction research. Ss received three agreeing strangers (having 4, 8, or 16 similar attitudes to the Ss) consecutively and evaluated each stranger after reading his attitudes. Other Ss received all three strangers simultaneously and then evaluated each stranger. Whereas Ss in the successive-stranger design did not give significantly different attraction scores to the three strangers, for the Ss in the simultaneous-stranger design there was a significant effect attributable to the number of similar attitudes $(p < .05)$.

In his earliest formulation of his theory of interpersonal attraction, Byrne (1961) proposed that attraction toward a stranger increases as the similarity between the S and the stranger increases. Extending this conceptualization, Byrne (1962) suggested that attraction toward a stranger is determined by the number of rewards relative to the number of punishments received from the stranger, but it was

Table 1
Obtained Attraction Means and Means
Predicted on the Basis of Actual
and Perceived Similarity

	Number of Attitudes		
	4	8	16
Successive Condition			
Obtained Mean	10.00	10.52	9.95
Predicted Mean on Basis of Actual Similarity	12.06	12.06	12.06
Predicted Mean on Basis of Perceived Similarity	10.81	10.75	10.86
Simultaneous Condition			
Obtained Mean	9.52	11.10	10.84
Predicted Mean on Basis of Actual Similarity	12.06	12.06	12.06
Predicted Mean on Basis of Perceived Similarity	10.70	11.19	11.41

number of attitudes should have no effect on attraction. Moreover, it is further hypothesized that the effect of number of attitudes in a simultaneous design is attributable to differential inferred similarity between the S and each stranger.

METHOD

Students in introductory psychology at Purdue University were administered a 32-item attitude survey at the beginning of the semester. Several months later, 38 Ss were seen in small groups for the experimental session. Ss were given three strangers to evaluate, each stranger having either 4, 8, or 16 attitudes similar to those of each S. Different attitude topics were assigned to each stranger. Ss were told that the strangers were three different students of the same sex and approximate age of the Ss and that the attitudes for each stranger were drawn randomly from his (or her) attitude survey. In the successive-stranger condition, Ss read the first stranger's attitudes and then evaluated him on an Interpersonal Judgment Scale (IJS), then read the second stranger's attitudes and made evaluations, and then read the third stranger's attitudes and completed a third IJS. In the simultaneous-stranger condition, Ss read all three strangers' attitudes and then evaluated each on an IJS. The IJS is a six-item 7-point rating scale on which the stranger can be evaluated in terms of his intelligence, knowledge of current events, morality, adjustment, and how much the S would like the stranger and how much the S would enjoy working with the stranger. The last two items are summed to yield the dependent measure of attraction ranging from 2 to 14 with a split-half reliability of .85 (Byrne & Nelson, 1965). The numbers of attitudes of the strangers' surveys were counterbalanced for order effects, so that each number of attitudes was presented first, second, and third. Thus, there were two conditions having 19 Ss each, with one third of the Ss in each condition receiving

one of the three orders of presentation of the strangers. After evaluating the strangers, all Ss completed 32-item attitude surveys (identical to the ones that were administered to them earlier in the semester) as they thought the three different strangers would fill them out.

RESULTS

Analysis of variance of the attraction scores for the successive- and simultaneous-stranger designs indicated no order effects. The means of the attraction responses arranged according to the number of similar attitudes are shown in Table 1 (see the obtained means). The effect of number of similar attitudes was not significant for the successive-stranger design (F = .324, df = 2/36, n.s.), but this effect was significant for the simultaneous-stranger design (F = 3.40, df = 2/36, p < .05). The attraction scores for the stranger with four attitudes were significantly different from the scores for the stranger with eight attitudes (t = 2.20, df = 18, p < .05), and the stranger with 16 attitudes (t = 2.72, df = 18, p < .02). The attraction scores for the 8-attitude stranger did not significantly differ from those of the 16-attitude stranger.

The means of the proportion of inferred similarity between the Ss and the three strangers are given in Table 2. The difference between the proportions is not significant for the successive-stranger design. However, the difference between the means of the proportion, is highly significant for the simultaneous-stranger design (F = 18.49, df = 2/36, p < .0001). The difference between the proportions of inferred similarity for the 4-attitude and 8-attitude strangers was found to be significant (t = 3.57, df = 18, p < .01), as well as between the 16-attitude and 4-attitude strangers (t = 5.09, df = 18, p < .001) and between the 16-attitude and 8-attitude strangers (t = 2.38, df = 18, p < .05).

DISCUSSION

The process by which Ss evaluate strangers in the simultaneous-stranger design is possibly different from that process involved in a between-groups design. It seems that in the former situation Ss might be comparing the information presented for each stranger and forming some judgment concerning an inferred similarity between themselves and each stranger. Attraction toward each stranger is related, as Tables 1 and 2 indicate, to the degree of this inferred similarity. For some as yet unspecified reason, Ss who agree with the stranger on 100% of the items differentiate and show higher attraction scores toward a stranger when they have seen a larger number of his attitudes (in this particular case 8 and 16 attitudes vs 4 attitudes). Additionally, Ss in

Table 2
Mean Proportions of Inferred Similarity
Between the Ss and the Three Strangers
as a Function of Treatment Condition

	Number of Similar Attitudes		
Treatment Condition	4	8	16
Successive Strangers	.77	.76	.78
Simultaneous Strangers	.75	.84	.88

the simultaneous condition are more accurate in perceived similarity, or make more appropriate estimations of the similarity between themselves and the strangers, when more attitudes are presented. That is, they perceived themselves to be more similar to the stranger when 8 and 16 attitudes were presented than when 4 were presented.

The possibility exists that in this situation where actual similarity is 100%, Ss respond more on the basis of perceived similarity than actual similarity. Table 1 gives the attraction means for actual and perceived similarity predicted from the Byrne & Nelson (1965) function and the actual obtained means. It is obvious that the means predicted from perceived similarity are much closer to the obtained means than those predicted on the basis of actual similarity. Individual comparisons between the obtained attraction means and the attraction means predicted from perceived similarity indicate that five of the six comparisons do not differ significantly. On the other hand, five of the six comparisons between the obtained attraction means and the attraction means predicted from actual similarity do differ significantly.

Obviously, in simultaneous and successive designs, attraction is not merely a function of the weighted proportion of positive reinforcements; some sort of contextual variable or variables are also operative. Further research is needed with both within-Ss designs to ascertain the nature of these contextual variables.

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