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Multiple-choice learning of line-drawn facial features: III. Transfer as a function of performance or observation

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Utilizing data previously reported (Marx, 1979b, 1979c), this article extends the analysis of sex differences and performance/observation in transfer. Some rather complex interactions relating performance/observation in learning to same-sex or different-sex stimulus materials are interpreted as suggesting that transfer may be more effective after performance for relatively easy materials and more effective after observation for more difficult materials.

In previous experiments (Hillix & Marx, 1960; Marx, 1978; Marx & Marx, 1978; Marx & Witter, 1972), subjects who performed (i.e., actually made responses and received appropriate feedback) were found to transfer rewarded responses more to new test situations than did paired subjects who observed (i.e., watched the responses being made and received equivalent information as to the outcomes). This report represents an effort to confirm that result utilizing data previously reported (Marx, 1979b, 1979c).

The stimulus materials used in these experiments were line-drawn male and female faces that would seem to facilitate transfer effects.

The problem is a theoretically important one because, if directly rewarded (performed) responses can be shown to transfer more effectively to new situations, this fact will constitute evidence for the crucial role of the reward process, even if more cognitive factors, such as the information provided in knowledge of results, are sufficient to account for acquisition itself.

METHOD

Because no new data are presented here, procedural detail, which are reported in Marx (1979b, 1979c), are not reiterated.

RESULTS

In the previous report (Marx, 1979c), it was hypothesized that the tendency for subjects to remember and transfer more same-sex faces under performance and more different-sex faces under observation might be more meaningfully interpreted in terms of the sex of the stimulus materials rather than of the same- or different-sex relationship of those materials to the subjects. Accordingly, the reliable triple interactions (Marx, 1979c, Figures 1-4) were plotted in terms of sex of the facial materials.

In the present report, this line of inquiry is continued. Direct comparisons of Groups f-F (training on features, transfer test on faces) and F-f (training on faces, transfer tests on features) were made in an effort to shed further light on some of the complex interactions described and graphed in the earlier report. Subjects in the f-F and F-f groups were categorized in terms of whether they learned and transferred more under performance (P>) or observation (O>) for both types of stimulus materials and also whether they transferred more male (M>) or female (F>) stimulus items. Ties were ignored in these analyses.

Figure 1 shows the relative frequencies of subjects who made more correct transfer responses after performance or after observation for faces and for features, for female stimuli. This interaction was reliable ($\chi^2 = 11.11$, $p < .01$). It is apparent that tests on faces after observational training on features produced a disproportionately high frequency of subjects who made more correct transfer responses. The comparable interaction for male stimuli was not reliable ($\chi^2 = 2.25$).

The same transfer data are shown in Figure 2, broken down in terms of the number of subjects who showed more correct responses for male or for female stimuli. Here it is clear that male stimuli were relatively more effective when transfer was to faces and less effective when transfer was to features. This interaction was reliable ($\chi^2 = 14.85$, $p < .01$).

Because of the potential significance of the difference in difficulty of the male and female stimuli, an additional ANOVA was performed with sex of the stimuli as a main effect. In Group f-F, male faces were considerably, and highly reliably, more often identified than female faces [means of 2.28 and 1.72; $F(1,72) = 14.66$, $MSe = 2.56$, $p < .01$]. Comparable values for Group F-f showed slightly more correct feature identifications

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for female features (6.30 compared with 5.68), but the difference was not reliable ($F < 1.00$).

DISCUSSION

The present results obviously do not confirm the previous finding of more effective transfer following performance as compared with observation (cf. especially Marx & Witter, 1972, who used parts of real facial photographs in training and the full faces for test), at least not in any simple and direct manner. Nevertheless, the results do show some interesting interactions between the P/O variable and certain of the other variables, permitting inferences about the role of the performance variable.

For example, the last ANOVA reported clearly indicates that male facial stimuli were easier to identify than female stimuli when the transfer was from features to faces (cf. Figure 2). Furthermore, as Figure 1 of the previous report (Marx, 1979c) shows, there was much more retention of male features under performance, especially by male subjects. The implication is that male features were both more readily remembered and transferred to face identifications under performance. Figure 3 of that report (Marx, 1979c) indicates that, for male subjects at least, male features did transfer more readily to face identification. Female features, on the other hand, were both more readily remembered, by both sexes, when acquired under observation, and more readily transferred, again by both sexes, after observation.

The suggestion that emerges from the combination of these relationships is that transfer is greater under performance for relatively easy cues (i.e., male stimuli, when the transfer was from features to faces) and is greater under observation for relatively difficult materials (i.e., female features transferred to faces). Why this unexpected difference in training-transfer relationships occurred in the male and female stimuli is not clear, but it does seem much more likely that the obtained interactions were functions of the unintentionally manipulated learning-difficulty variable than of the directly manipulated sex-of-stimulus variable. The inferred interaction of difficulty of material and performance/observation offers an interesting theoretical proposition that is, of course, quite amenable to direction experimental test.

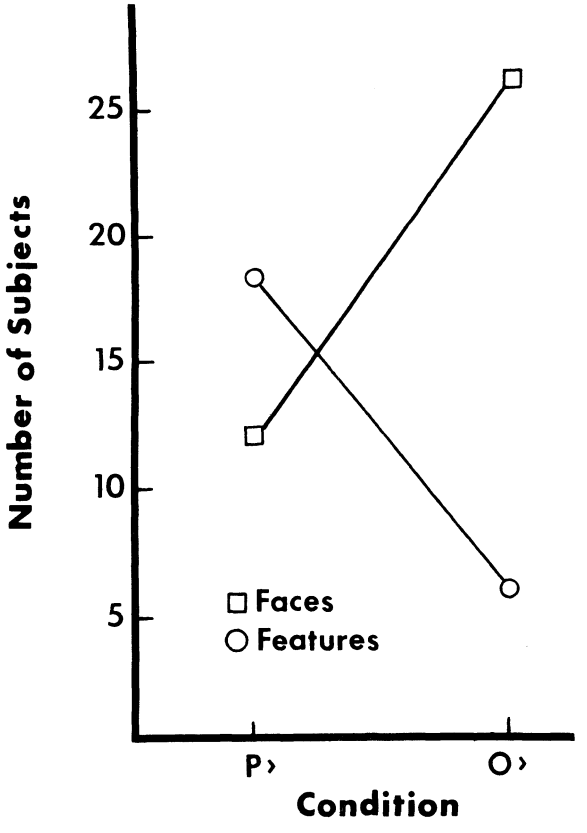

Figure 1. Number of subjects showing more correct faces (Group f-F) or features (Group F-f) in transfer under performance (P>) or observation (O>) for female facial stimuli.

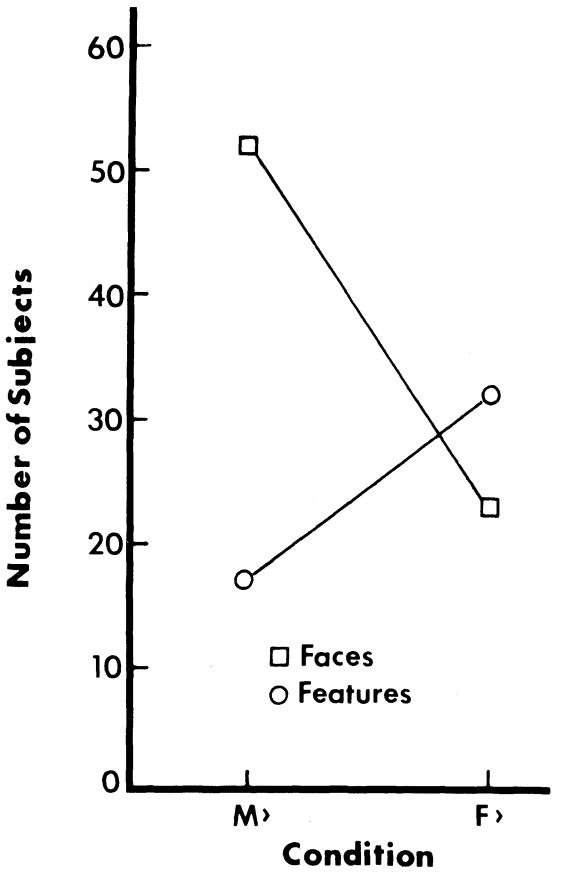

Figure 2. Number of subjects showing more correct male (M>) or female (F>) faces (Group f-F) or features (Group F-f) in transfer.

Some indirect support for the suggested interaction may be adduced from the reasonable presumption that more difficult materials require more rehearsal, which is more readily implemented under observation than under performance, because the performer is distracted by the making of the response.

The question also naturally arises as to why there should be more transfer for the simpler materials under the performance condition, as the data seem to indicate. Why should not observation, with the greater opportunity for rehearsal that it affords, produce greater transfer for both kinds of materials? If the performance process is assumed to mediate reward more directly than observation, as has been assumed in the design of experiments utilizing the perform/observe manipulation, then the present results may be regarded as offering some support for the role of reward in facilitating transfer, at least in simpler learning situations.

Certain caveats concerning the foregoing analyses may be appended. For example, the order of presentation of the two

sets of facial stimuli was not varied, so that the order variable was confounded with sex of the stimuli. One is of course free to utilize the order variable, if one wishes, in drawing inferences from the results. However, no very sensible inferences using this variable have yet come to mind, and the chain of inferences in which same- or different-sex relationship to subject was first converted to sex of stimuli and subsequently to difficulty of material, therefore, has no competition on that score. Apart from any particular questions, a great many of which can be raised, the strictly suggestive nature of the inferences needs to be emphasized. Nevertheless, it is my strong conviction that we need more of this kind of empirically based, hypothesis-producing inquiry to complement the more orthodox, tightly controlled, and cautiously evaluated confirmatory type of research (Marx, 1979a; cf. Tukey, 1979) and that the risk/benefit ratio can be held within acceptable limits if the exploratory character of such research is recognized.

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