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SOCIAL PERCEPTION
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CHAPTER 14:

The Influence of Culture on Visual Perception*

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The selections in Part 111 of our collection trace dilferences in social perception to environmental forces that shape the minds of perceivers. The first selection establishes the impact of visual experience on object perception. It summarizes a large-scale study which demonstrated that gross characteristics of a person's physical environment (such as dense jungles as opposed to flat land) affect the dimensions of the person's perceived space in ways that are measurable with standard laboratory illusions. This fact implies that the assumption of universality in perception is always a risky one.

One noteworthy methodological feature of the study is the fact that the perceptual environment of the persons investigated was carefully inventoried, so that their responses to the laboratory test situation could be systematically related to the world in which they lived.

The material included here is drawn from the volume The Influence of Culture on Visual Perception *(Bobbs-Merrill Co., 1966), and represents the "Summary and Conclusion" section (Chapter 8) of this volume.*

That human perception is culturally influenced has long been a proposition entertained by many social scientists. The plausibility of this proposition is high, based as it is upon certain contemporary philosophical and social scientific concepts, such as that of cultural relativism. Moreover, many facts gathered in psychological laboratories by students of perception, facts that delineate the important role of an individual's experiences in his subsequent perceptions, enhance the plausibility of this proposition....

But however plausible and however widespread its acceptance, the proposition cannot be considered to be unequivocally demonstrated by very many empirical data. In part because of the largely anecdotal character of the cross-cultural evidence available in the literature and in part because of certain methodological difficulties inherent in any research on perceptual differences . . . considerably more effort to amass systematic evidence of cultural differences in perception was called for.... The result of these considerations was a cooperative data-collection effort in some 15 societies. The stimulus materials employed were based upon five geometric illusions. These materials

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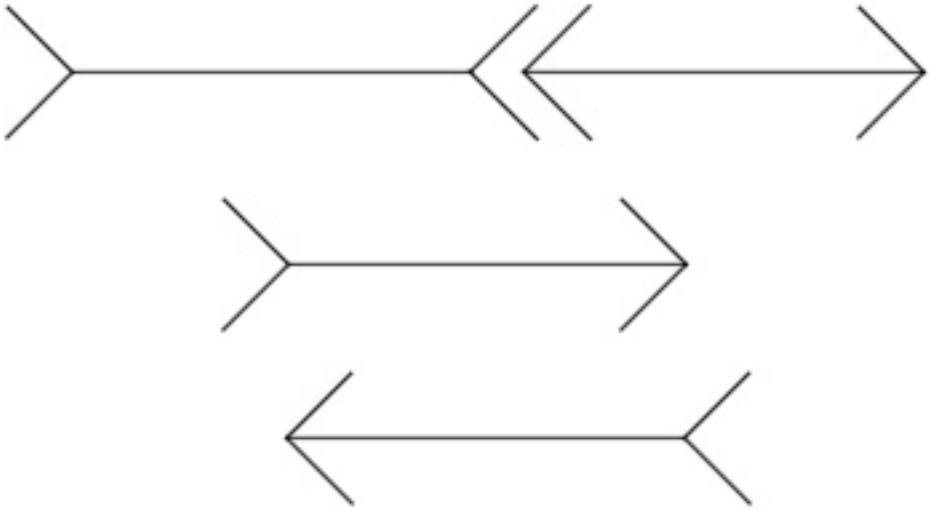
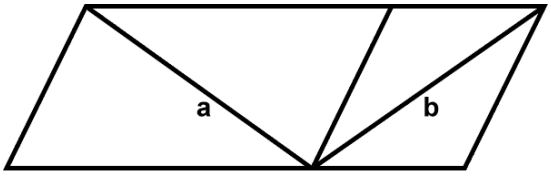
were chosen primarily because of their relation to a theoretical approach that appears both plausible and testable. Briefly, that approach is empiricist, in that it places emphasis upon the role of learning in visual perception. More specifically, it is based on the Brunswikian notions of ecological cue validity and probabilistic functionalism.

Proceeding within this framework, we predicted that people in different cultures would be differentially susceptible to geometric illusions because they have learned different, but always ecologically valid, visual inference habits. Depending upon the degree of ecological unrepresentativeness of the illusion-inducing figure, these habits may or may not result in illusion susceptibility. Then, applying this general hypothesis to the five illusions, we generated a number of specific, different hypotheses.



Müller-Lyer Illusion
Müller-Lyer, F.C. *Arch. Anatomie u.Physiol. Physiologische Abt. 2 (Suppl.)* 1889, 263
Müller-Lyer, F.C. *Z. Psychol.* 1896, 9, 1 Day, R.H.; Knuth, H. (transl.) *Perception* 1981, 10, 126

The illusions employed in this study were the Müller-Lyer and the Sander parallelogram illusions, two versions of the horizontal-vertical illusion, and an illusion we have termed "perspective drawing." (An attempt was also made to collect data with the Poggendorf illusion, but procedural difficulties hampered these efforts.) Each of these five illusions was represented by several items in the stimulus materials; and for each illusion, the discrepancy in the length of the segments to be compared varied from item to item. As each item was displayed, the respondent's task was simply to indicate the longer of two segments. Complete response protocols were collected from 1,878 persons in 14 non-European locations and in the United States. These were collected over a six-year period by a team of fieldworkers in anthropology, psychology, and, in one instance, psychiatry.

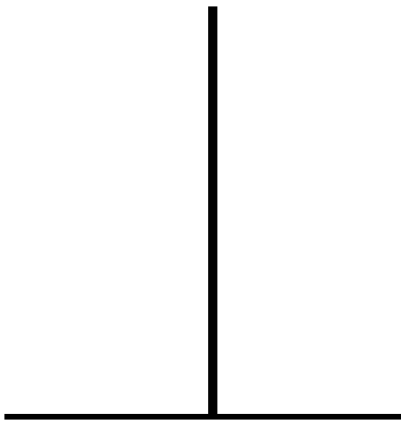


Sander's parallelogram
Sander, F. *Neue Psychol. Studien* 1931, 8, 311

To minimize difficulties in communication between fieldworkers and respondents, the stimulus materials were designed so that the linear segments to be compared were not connected to each other or to any context segments, and different colors were employed. Respondents could indicate choice either by selecting one of two colors (on the horizontal-vertical items) or by indicating a position, e.g., right or left (on the other illusions). Other steps taken to enhance the validity of the response protocols included the administration of a short comprehension test requiring judgments similar to, but more obvious than, those demanded by the stimulus items. Moreover, an internal-consistency check was later made on each protocol, and wherever irrelevant response sets were detected, those protocols were withheld from one analysis. A comparable analysis was performed with *all* 1,878 protocols, and the results of both kinds of analysis were substantially identical. After the completion of these analyses, additional data, including three sets from societies not sampled in our original study, were analyzed, and the results of this analysis substantiated the previous findings.

It was found that on both the Müller-Lyer and the Sander parallelogram illusions the European and American samples made significantly more illusion-supported responses than did the non-Western samples. On the two horizontal-vertical illusions, the European and American samples had relatively low scores, with many, although not all, of the non-Western samples scoring significantly higher. All samples appeared to be minimally susceptible to the perspective drawing — this suggests that it was a weak illusion generally — and no significant intersample differences occurred.

The finding on which we place greatest stress is the bidirectionality of the differences found for the Müller-Lyer and the Sander on the one hand, and the two horizontal-verticals on the other. Cross-cultural comparisons made by Rivers over a halfcentury ago also indicated that non-Western peoples might be less susceptible than Europeans to illusions like the Müller-Lyer and, sirnultaneously, more susceptible to the horizontal-vertical illusions. Rivers' findings, like those of the present study, thus appear to be in accord with an empiricist, functionalist interpretation that relates visual response habits to cultural and ecological factors in the visual environments.



The "Horizontal-Vertical" illusion

REPRISE OF THE HYPOTHESES

We will now restate our hypotheses and assess their tenability in the light of what we have learned from all the data we have considered.

For the Müller-Lyer and Sander parallelogram illusions we put forth the "carpentered-world" hypothesis and an "experience with two-dimensional representations of reality" hypothesis; both of these hypotheses led to the prediction that Western peoples would prove more susceptible to these illusions than non-Western peoples. We found considerable support for both hypotheses in our own and others' (e.g., Rivers, Allport and Pettigrew) data. The data on age trends did not support these hypotheses, but we argue that a real test requires data collected from children younger than those thus far studied. We must also acknowledge that in terms of these hypotheses we are unable to explain the precise position occupied by each of our samples along the dimension of illusion susceptibility; but we claim that no other hypothesis we have considered provides a better over-all prediction of these positions. In sum, then, we find the "carpentered world" and "experience with pictures" hypotheses both tenable and promising with respect to future research in perception.

We offered quite another hypothesis as a source for predicting different cultural susceptibilities to the horizontal-vertical illusions. This hypothesis argues that another aspect of the physical environment of peoples — specifically, the presence or absence of broad, horizontal vistas — is crucial in shaping the visual inference habit that leads to horizontal-vertical illusion susceptibility. If one lives in an environment that provides many opportunities for looking at horizontal expanses, one should become subject to the tendency to infer long, frontal-plane, horizontal distances from short, vertical retinal images. This inference habit, we argued, should contribute to the horizontal-vertical illusion. Accordingly, we predicted that plains dwellers would prove maximally susceptible, urban dwellers moderately susceptible, and groups that live in restricted environments (e.g., equatorial forests) minimally susceptible to the horizontal-vertical illusion. Again, with just a few qualifications, we found a good fit of our data to this hypothesis.

What is perhaps most encouraging about our findings is the clear-cut demonstration that the cross-cultural differences in our data were not the same for all illusions, and that for each illusion the differences were in accord with our predictions. Accordingly, in spite of certain inadequacies of detail, we feel confident in offering our hypotheses for further consideration. Our data lead us to expect that the findings likely to be uncovered by additional research will prove similar in kind to those reported here and will constitute important amendments to our hypotheses rather than contradictions of them, and that the hypotheses will continue to stand, at least in their general form.

CONCLUSION

Perception is an aspect of human behavior, and as such it is subject to many of the same influences that shape other aspects of behavior. In particular, each individual's experience combine in a complex fashion to determine his reaction to a given stimulus situation. To the extent that certain classes of experiences are more likely to occur in some cultures than in others, differences in behavior across cultures, including differences in perceptual tendencies, can be great enough even to surpass the ever-present individual differences within cultural groupings.

We have reported here a study that revealed significant differences across cultures in susceptibility to several geometric, or optical, illusions. It should be stressed that these differences are not "racial" differences. They are differences produced by the same kinds of factors that are responsible for individual differences in illusion susceptibility, namely, differences in experience. The findings we have reported, and the findings of others we have reviewed, point to the conclusion that to a substantial extent we learn to perceive; that in spite of the phenomenally, absolute character of our perceptions, they are determined by perceptual inference habits; and that various inference habits are differentially likely in different societies. For all mankind the basic process of perception is the same; only the contents differ and these differ only because they reflect different perceptual inference habits.