

Mental Images and Their Transformations. R.N. Shepard and L.A. Cooper. Cambridge, Massachusetts: MIT Press, 1982, 340 pages, \$25.00.

Reviewed by Terence Hines, Pace University

Starting in the late 1960's, studies of mental imagery and mental rotation of those images carried out by Roger Shepard and his colleagues have probably done more than anything else to make the study of such internal mental phenomena, once again, a respectable pursuit for psychologists. One example of an elegant study conducted in this area comes from Cooper and Shepard (1973). Subjects were shown a single capital letter in block print. They had to decide whether the letter was in the normal orientation (**R**) or reversed in mirror-image fashion (**Я**). In addition to being normal or reversed, the stimulus could be presented tilted at various angles off the vertical. Reaction time for the normal vs. reversed decision was the dependent measure. The basic finding, since verified in other studies, was that as the stimulus was tilted more from the vertical, reaction time increased. Thus, for example, it took longer to respond to an "R" tilted 120° from the vertical than to make the identical response to one tilted only 60° from the vertical. In addition, when the tilt was greater than 180°, reaction time decrease as the tilt approached 360°. That is, reaction time was faster for an "R" tilted 300° than one tilted 240°.

Shepard concluded from results such as these that subjects performed some sort of mental rotation, rotating the image of the object in some analogue fashion, to the upright before a decision was made concerning whether it was normal or reversed. Further, rotation took place over the shortest path to the vertical, explaining the decrease in reaction time as tilts get larger than 180°. This process of mental rotation takes place in real time and, by using techniques such as that described above, the time course of such internal mental processes can be mapped out.

Shepard's studies have been extremely influential in shaping thought in current cognitive psychology. Thus the appearance of a book by Shepard and Cooper on mental imagery should be an important and exciting event. Alas, the present book is a great disappointment. Of its 340 pages of text, 231 pages are reprints of papers by Shepard and colleagues that have previously appeared in widely available journals and books. The reprinted papers (which often have some of the more detailed sections on methods and statistical analyses removed or shortened) are divided into three sections: Mental Rotation, Other Transformations, and Apparent Motion. Each section starts with a short introduction and ends with a longer epilogue. It is in the epilogues that Shepard and Cooper review the work of other researchers which is relevant to the issues addressed in the papers reprinted in the previous section. The epilogues are the best part of the book, but they contain a total of only 58 pages and are certainly not worth the \$25 being asked for the book. Readers interested in this field will find it much cheaper, and just as informative, to consult other recent reviews published by Shepard (Cooper and Shepard, 1978; Shepard, 1981; Shepard and Podgorny, 1978). Should libraries purchase this book? No. The fact that, as noted above, statistical and methodological details have been eliminated from several papers renders the collection less than useful for archival and research purposes.

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