

The Effect of Transparent and Opaque Illusory Contour Occluders on the Motion Interpretation

Shwu-Lih Huang^{1, 2}, Chia-Yang Liu¹, Hua-Chun Sun¹, and Hung-Wei Lee¹

¹ *Department of Psychology, National Chengchi University*

² *Research Center for Mind, Brain, and Learning, National Chengchi University*

Based on the theories of midlevel or medium-level vision, the information about visual surfaces can have critical effects on the motion interpretation. Many of the evidences have revealed to support this theoretical point. Following such aspect, the purpose of this study is to explore how the attributes of the surface affect the motion interpretation. The major focus is to test whether the illusory contour, instead of real contour, being the occluders can also have similar effect on the motion interpretation. In addition to this test, the study on how transparency of the occluding surfaces influence motion interpretation is also performed. The paradigm developed by McDermott, Weiss, and Adelson (2001) was used in the present study. In experiments one and two, two types of illusory contour were designed as occluders. The results showed that illusory contour occluders affect motion in a similar manner as that of real contour occluders. And the effect was smaller for the transparent illusory contour as compared to the opaque illusory contour. In the subsequent three experiments, we designed various types of contour and manipulated transparency by different methods for comparison. It was found that the smaller effect

of transparent illusory contour, when compared to opaque illusory contour, could be replicated in all three experiments. However, in the condition of real contour, the effect of transparency was not shown. Also, manipulating the transparency by different methods showed different effects in these three experiments. The most stable effect was obtained in manipulating the figural configurations to induce transparency in the illusory contour. Transparency induced by dynamic motion cue only showed a minor effect. Manipulating transparency by static binocular depth did not show any significant effect. From the results of all five experiments, the important role of the surface formation in motion processing which was predicted by the midlevel or medium-level vision theories was partially confirmed. On the other hand, not to be covered by these theories, that transparency of the surface can influence motion interpretation only in some of the conditions was observed in this study. Further research will be needed to reveal more details of the issue.

Keywords: *motion perception, illusory contour, transparency, occlusion, midlevel vision*

