The Effects of Selective Mapping Between Complex Domains on Creativity in a Generation Task

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Introduction

Analogy has long been associated with creativity. However, the structured use of analogical reasoning to enhance creative idea generation has received little empirical attention. In the current study, we examine the effects of selective attention to structural components of the source domain to subsequent mapping and transfer of those components to the target domain and the effects this has on the creativity of the final product. Conditions differ only in terms of the attended structural elements, not the degree to which the elements share higher order correspondences with target domain elements.

We predict that participants will be more likely to use attended rather than unattended source domain elements when mapping between the source and target domains during idea generation. We also predict that these elements will be more likely to be transferred to the target domain for use in the final product. However, we predict no differences between conditions in terms of creativity and attention to structure in the final product since participants in both conditions are mapping source domain components of equal structural complexity to the target domain. Finally, because source domain elements are going to be novel solutions to target domain issues, we predict that greater levels of mapping and transfer of those components to the target domain will be associated with greater creativity of the final product. Ability to map and transfer these structural components from the source to the target domain should also enhance attention to structural components in the final product.

Methods

Stimuli and Procedure

60 groups (30 groups each in Conditions A and B) of 2-4 Oakland University students were taught to use analogy to develop a new process for conducting group projects (**target domain**). Participants then viewed a 15 slide PowerPoint presentation about the movie industry (**source domain**). On five of the slides, participants were told to note one similarity or difference between the source domain information on that slide and the target domain. These "**Mapping Suggested**" slides varied between conditions.

Following the presentation, the participants used similarities and differences between the source and target domains to generate ideas (mapping). Participants then compiled these ideas into a plan for conducting group projects in class (transfer).

Results

Groups were significantly more likely to map to the target domain the "Mapping Suggested" source domain information (5.7 items) than information for which they had not listed a similarity or difference (3.9 items), $t(59)=5.70, p<.01$. The same was true for the number of "Mapping Suggested" items included in the final plans (5.1 versus 3.9 items), $t(59)=2.07$, $p < .05$. However, this did not translate into difference between conditions in either the creativity of the final plans or attention to relationships within those plans, $p > .20$.

This is not to say that attending to source domain components and subsequently using those elements during mapping and transfer does not affect the quality of the final product. The greater the number of source domain components mapped to the target domain during idea generation, the greater the attention to structural information in the plans ($r=.29$, $p <.05$). The greater the number of items transferred from the source to the target domain and incorporated into the plans, the greater the creativity of those plans ($r = .27$, $p < .05$).

Discussion

When participants' attention was drawn to structural information in the source domain during learning, they were more likely to map and transfer that information to the target domain. The results also suggest that, as long as the source domain information mapped to the target domain shares higher order structural correspondences to the target domain, it is possible to use that information to generate creative solutions for the target domain. The specific information used during mapping and transfer is less important than the degree of information mapped and transferred. The more information mapped and transferred to the target domain, the more creative the final product.