

Object and spatial imagery: distinctions between members of different professions

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Abstract In the current research, we took a new approach to examining individual differences in mental imagery that relied on a key distinction regarding visual imagery, namely the distinction between object and spatial imagery, and further examined the ecological validity of this distinction. Object imagers consistently prefer to construct colorful, pictorial, high-resolution images of individual objects and scenes, and spatial imagers prefer to use imagery to schematically represent spatial relations among objects and can efficiently perform complex spatial transformations. To examine the ecological validity of the object versus spatial imager distinction, we examined the object and spatial imagery preferences and skills of groups of professionals.

Visual artists, scientists, architects, and humanities professionals completed two types of imagery tests: spatial imagery tests assessing abilities to process spatial relations and perform spatial transformations, and object imagery tests assessing abilities to process literal appearances of objects in terms of color, shape, and brightness. A clear distinction was found between scientists and visual artists: Visual artists showed above average object imagery abilities but below average spatial imagery abilities; whereas, scientists showed above average spatial imagery abilities but below average object imagery abilities. Visual artists tended to be object imagers, and scientists tended to be spatial imagers. Thus, even though both groups use visual imagery extensively in their work, they in fact tended to excel in only one type of imagery.

Furthermore, we interviewed the groups of professionals about imagery characteristics and imagery processes that we had them interpret kinematics graphs and abstract art, and we monitored their eye-movements as they

engaged in various perception and imagery tasks. The data revealed various qualitative differences between the professional groups. Both visual artists and scientists reported using imagery in their work. However, visual artists preferred to use object imagery, but scientists preferred to use spatial imagery for their work.

Humanities professionals, however, reported less use of imagery. Additionally, visual artists reported that their images were more likely to come as a whole, but scientists reported that their images were generated part-by-part. Visual artist's images were more persistent, less intentional, and had multiple meanings as compared to scientist's images. Furthermore, visual artists and scientists interpreted kinematics graphs and abstract art qualitatively differently. Visual artists tended to interpret graphs literally (graphs-as-pictures), but scientists tended to interpret graphs schematically, in abstract way. However, visual artists tended to interpret the abstract art as abstract representations, but scientists tended to interpret abstract art literally, in a concrete way.

The finding that professional domain, where work involves extensive use of object or spatial imagery, differentially predicted object and spatial imagery abilities and approaches in processing visual information provides ecological validation of the distinction between object and spatial imagers. Furthermore, these results provide support for the idea of a trade-off between object and spatial imagery abilities (i.e., a person being more effective at using one type of imagery and then tending to use this type of imagery more frequently than and at the expense of the other type of imagery).

Keywords Visual imagery • Individual differences • Object and spatial imagery

