Abstract Art as a Universal Language?

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ABSTRACT ART AS A UNIVERSAL LANGUAGE?

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Abstract

The concept of abstract art as “world language” became famous after documenta II (1959). Abstract art was considered as universally comprehensible and independent of cultural, political or historical contexts. However, this was never explicitly tested empirically. If these assumptions were true, there should be higher intersubjective coherence in perceiving abstract paintings compared to representational art. In order to test this hypothesis, the authors recorded the eye-movements of 38 participants and collected information on their cognitive and emotional evaluations. The results suggest that the concept of abstract art as a universal language was not confirmed and needs to be revised.

In 1959 documenta II in Kassel introduced the general public to the concept of abstract art as a “world language” [1]. This view was not only advanced by art historians such as Haftmann, the leading theorist of this documenta, or Clement Greenberg, but also by artists like Barnett Newman [2]. The ambition of artists like Jackson Pollock, Robert Motherwell and others was to promote the unprejudiced act of experiencing the pure value of lines and colors as such [3], which led to an increasing importance of the act of beholding. If this concept of abstract art as “world language” holds true, it should be seen in the act of beholding. We conducted an empirical study in which we expected that, if abstract art can be interpreted as a universal language, perception should be more homogeneous for abstract than for representational art. Assuming that the major elements of art perception are the actual seeing (eye-movements) and cognitive / emotional reactions, there should be a stronger intersubjective coherence in these elements in response to abstract, compared to representational, artworks.

Study Design

38 participants were shown high-quality reproductions of 5 abstract and 5 representational paintings for 2 minutes each in random order on a high resolution computer screen (2560 x 1600 px). After viewing each painting, participants were asked to use a 7-point scale semantic differential (13 bipolar adjectives, e.g. active – passive, friendly – unfriendly, etc.) to indicate their cognitive and emotional evaluation of each artwork [4]. We matched the set of abstract artworks with a set of representational counterparts with regard to formal criteria, like dynamics, color and composition (Fig. 1 and Fig. 2.). Abstract art by definition does not depict recognizable objects, but instead uses shapes and colors for their own expressive value in a nonrepresentational way. The set of abstract paintings we chose includes two works by Kandinsky and one each by Pollock, Motherwell and Götz. Works of all these painters were part of documenta II. We chose the 5 abstract paintings in order to have significant differences in color, in the number of depicted elements and dynamics without manipulating the original artworks. The set of representational counterparts was chosen according to results of a pre-study by 28 experts, who considered them as similar to the abstract paintings. Besides image characteristics, we controlled the participants’ gender and expertise. We measured expertise by taking into account the participant’s field of study, their knowledge about the selected artists and the frequency in which they conduct art-related activities in their leisure time, such as going to museums or talking about art with friends. We recorded the eye-movements of the participants while they were perceiving the artworks, using a binocular remote eye-tracker (SMI Red 120). Fixations of the eye usually correspond to visual attention. Therefore it is possible to describe participants’ attention profiles by analyzing fixation patterns. In the analyses, we compared the attention profiles evoked by the two groups of artworks. To measure the distribution of fixations we chose a bottom-up approach – not defining regions of interest in advance. Thus a cluster – or region of interest – was defined as an area with a radius of 90 px and with a min. of 5 fixations per minute. We measured the number of fixations (expressed as a percentage) located in clusters (Fig. 1 and Fig. 2.). A high number of fixations located in clusters can be interpreted as a focused or directed attention, while for a low number of fixations located in clusters a broader distribution of attention can be assumed, resulting in a more diffuse attention profile. Thus the latter is a sign of lower coherence. The emotional and cognitive responses were analyzed separately from the eye-tracking data.

Fig. 1 and Fig. 2: Visualization of one participant’s eye-movements when viewing Félix Vallotton “Street Scene” (left) and Vasily Kandinsky “Accompanied Contrast” (right) analyzed with Eye-Trace. Black circles indicate single fixations, white circles indicate shared clusters (38 persons): The representational artwork shows more coherence. (© Laboratory of Cognitive Research in Art History, University of Vienna)
Results
We ran two separate mixed linear models with random intercepts and random slopes for image characteristics (intensity of color, number of depicted elements, presence of depicted humans, abstraction as dichotomous variable).

The first model (Fig. 3. Model 1) addresses the question whether there are differences in individual attention profiles of participants concerning abstract and representational artworks. Here, the dependent variable was the number of fixations located in individual clusters. The analyses revealed a highly significant difference ($p<0.001$) in participants’ attention profiles when viewing abstract compared to representational art, despite controlling for image characteristics: participants show 10.17% more diffuse attention profiles when viewing abstract art. While none of the socio-demographic variables influenced the effect significantly, image characteristics played a major role in structuring attention. Bright colors tended to raise focused attention (very bright colors $\beta = 13.63$, $p<0.001$; medium bright colors $\beta = 11.02$, $p<0.001$) and the number of depicted elements led to more diffuse eye-movement patterns (high number of depicted elements $\beta = -10.39$, $p<0.001$). As the ICC for all image characteristics was below 0.01, 10.17% more diffuse attention profiles are reported. The second model (Fig. 3. Model 2) predicts the homogeneity of the localization of fixations.

We analyzed the collective distribution of attention by modeling the number of fixations located in shared regions of interest. We found very similar results as in the analysis of number of fixations: the effect of abstraction ($\beta = -11.04$) was highly significant ($p<0.001$) and there were no significant effects for socio-demographic data, but highly significant effects for image characteristics (very bright colors $\beta = 20.55$, $p<0.001$; medium bright colors $\beta = 13.34$, $p<0.001$; high number of depicted elements $\beta = -16.49$, $p<0.001$). In the second model the effect of depicted humans was also significant ($p<0.05$): especially faces in a painting led to slightly more consistent clustering of attention ($\beta = 3.26$). As in the first model, the ICC for all image characteristics was below 0.01.

The analysis of the semantic differential concerning the two different types of paintings showed a consistent rating for some items. But the items participants rated coherent differed from painting to painting (e.g. Pollock was rated by 95% of the participants as active, excited and dynamic). Obviously different paintings have different qualities and people seem to agree strongly in items which describe the essential quality of a work, independent of its type – abstract or representational. In order to test for coherence, we compared the mean of the standard deviation to examine how homogeneous the evaluation was. Stronger coherence comes along with smaller standard deviation. A T-Test revealed no significant effect ($p = 0.8$). We thus conclude that there are no differences between abstract and representational artworks concerning the coherence of cognitive and emotional response.

Conclusion and Limitations
One of the most persistent theories in modern art claims that abstract art is a universal language. In an empirical study comparing perception and evaluation of abstract and well-matched representational counterparts we found no evidence that abstract art elicits more coherent beholder behavior. Quite the opposite: in contradiction to the idea of abstract art as a universal language, our results indicate that abstract paintings do not evoke a more homogeneous perception than representational paintings - neither concerning eye-movements nor regarding the evaluative responses. Eye-movement patterns clearly were more heterogeneous for abstract compared to representational art. Based on these findings, we provide empirical evidence that the idea of abstract art as a universal language needs to be revised.

References

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<tr>
<th>Fixed Effects</th>
<th>Model 1 % of Fixtions in Clusters</th>
<th>Model 2 % of Fixations in shared Clusters</th>
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<td>depicted humans</td>
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<td>13,34***</td>
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<tr>
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Legend: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$