



The Aesthetic Aha: On the pleasure of having insights into Gestalt



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ABSTRACT

Are challenging stimuli appreciated due to perceptual insights during elaboration? Drawing on the literature regarding aesthetic appreciation, several approaches can be identified. For instance, fluency of processing as well as perceptual challenge are supposed to increase appreciation: One group (Reber, Schwarz, & Winkielman, 2004) claims that fluency of processing increases appreciation. Others link aesthetics to engagement: Creation and manipulation of sense itself should be rewarding (Ramachandran & Hirstein, 1999). We experimentally tested the influence of insights during elaboration on liking. Pairs of stimuli – hardly detectable two-tone images including a face (Mooney face) and meaningless stimuli matched for complexity – were presented repeatedly. Having an insight as well as the intensity of the insight predicted subsequent gains in liking. This paper qualifies the role of insight (—aha!) on aesthetic appreciation through the effects of elaboration and problem-solving on understanding the processing of modern art.

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1. Introduction

1.1. Appreciating difficult pictures: reward by fluency or challenge?

Why do we like perceptually challenging pictures? This ostensibly simple question is still yet to be answered: Fluency of processing as well as perceptual challenge are said to increase appreciation. Fluency theories assume that the more fluent the processing, the higher the appreciation (Reber et al., 2004). Evidence is provided by, e.g., the “mere exposure effect” (Zajonc, 1968), proposing an increase in preference with repeated, unreinforced exposure to stimuli. Also the preference for prototypes (Winkielman, Halberstadt, Fazendeiro, & Catty, 2006) and symmetric stimuli (Reber, 2002) is explained by fluency, as they are supposed to be easier to process than their opposites. These classical findings do, however, conflict with findings that associate novelty or innovativeness with high reward and liking (Blijlevens, Carbon, Mugge, & Schoormans, 2012; Carbon & Leder, 2005; Wittmann, Bunzeck, Dolan, & Düzel, 2007). Modern art also often impedes everyday perceptual routines while being popular at the same time. It offers various examples of perceptual challenge and sometimes sheer unresolvable contradictions

(Meinhardt, 2009) and elicits “states of ambiguity, arousal, and uncertainty” (Jakesch & Leder, 2009, p. 2105) – like the football which is made of concrete in the artwork ‘jeu’ by Kristof Georgen. It produces a conflict between anticipated action and heavy material. Similar prediction errors were discussed and exemplified by Van de Cruys and Wagemans (2011), who claim that many artists combine familiar patterns with “a minimal deviation of default expectations” (p. 1043; see also the definition of indeterminacy by Pepperell, 2011, which “suggests the presence of objects but denies easy or immediate recognition”, p. 2). Also designers make use of visual–tactual incongruities to induce surprise in perceivers, which was found to augment a variety of emotions like interest, fascination, amusement, confusion, indignation and irritation (Ludden, Schifferstein, & Hekkert, 2012). In a similar fashion to the domain of music perception (Blood & Zatorre, 2001), these violations of expectation from visual cues might be linked to reward processing (Van de Cruys & Wagemans, 2011). The popularity of indeterminacy, surprise and contradiction in modern art and design obviously contradicts the often cited rule of ‘the easier the better’ once more and points to the necessity of incorporating further factors aside from fluency into research on aesthetic appreciation. Still, both ideas – that either easy or difficult stimuli increase appreciation – could have evolutionary advantages: Links between processing-fluency and reward could have been selected because familiarity signals harmlessness and fluency implies successful processing (Reber et al., 2004). Searching for novelty and challenges, on the other hand, might be rewarded in order to trigger exploration (Wittmann et al., 2007).

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A third line of research proposes that neither easy nor difficult stimuli are preferred but that moderate amounts of ambiguity are maximally pleasurable (Jakesch & Leder, 2009). This is linked to the claim by Berlyne (1974) that the relationship between preference and arousal is described by an inverted U-shaped function. Too little arousal, as well as too much, decreases liking. When a stimulus is repeatedly presented, the increase in fluency thus would decrease arousal and increase liking as revealed by the “mere-exposure-effect”. Over-exposure after saturation, on the other hand, would lead to “under-arousal” and a decrease in liking. This limiting factor of boredom on the “mere exposure effect” is reflected by the discovery that complex objects increase the positive effect of exposure to a greater extent than simple ones (for the visual domain Bornstein, 1989; for the tactile domain; Jakesch & Carbon, 2012). Remarkably though, boredom was found not only to be associated with decreased (Pattyn, Neyt, Henderickx, & Soetens, 2008), but also in some cases with increased, arousal (London, Schubert, & Washburn, 1972) (for an overview see Eastwood, Frischen, Fenske, & Smilek, 2012).

It is possible to combine typicality and novelty in music and design for the enhancement of pleasure (e.g., for consumer products see Hekkert, Snelders, & van Wieringen, 2003). This idea was recently re-investigated, stressing that arousal (by novelty) and familiarity (by prototypicality) both contribute, albeit independently, to aesthetic appreciation (Blijlevens et al., 2012). Such findings might explain the contradictory findings of preference for familiar stimuli (e.g. prototypes; Winkielman et al., 2006) and unfamiliar (or innovative) stimuli (Blijlevens et al., 2012; Carbon & Leder, 2005; Wittmann et al., 2007) discussed above. Nevertheless, a unified theoretical basis explaining the appeal of easy-to-process vs. difficult indeterminate stimuli is missing.

1.2. Connecting fluency and challenge by insights during elaboration

While fluency as well as arousal theories (Belke, Leder, Strobach, & Carbon, 2010; Reber et al., 2004) take into account that aesthetic appreciation can be “dynamic” (Carbon, 2011), they still focus on the stimulus level of the material, but frequently neglect elaboration, attitude and expertise on the side of the perceiver. In contrast to mere *passive* exposure, the interaction with a stimulus can involve active perceptual and cognitive engagement comprising a range of processes from a simple visual search to elaborate analyses of an artwork. Carbon and colleagues showed that after such ‘elaboration’ of material (Carbon & Leder, 2005), the perception process (Carbon, Hutzler, & 2006) as well as the preferences (Carbon & Leder, 2005; Faerber, Leder, Gerger, & Carbon, 2010) for innovative designs change quite dramatically. Here, elaboration was realised by conducting ratings on the presented designs of various variables like comfort or elegance. Other experiments varied the level of elaboration by supplementary information, be it interpretive titles (Leder, Carbon, & Ripsas, 2006; Millis, 2001) or stylistic information (Belke, Leder, & Augustin, 2006). The sum of regarding findings reveals that the appreciation of perceptually challenging pictures is dynamic and strongly dependent on the quality and extent of elaboration.

Looking at aesthetic appreciation as a dynamic process allows us to connect the contradictory accounts by assuming that perceivers re-familiarise themselves with a challenging stimulus by on-going elaboration, and thus increase their processing-fluency. This is strongly related to the proposal of Van de Cruys and Wagemans (2011) that the effort of reducing prediction errors changes initially negative arousal into perceptual pleasure; the reduction of uncertainty is rewarded. Such dynamics play a big role in the perception and evaluation of modern art if we define it as rather a kind of complex problem solving than as simple processing (Dörner & Vehrs, 1975). In other words, the processing of perceptually challenging situations is said to be particularly pleasurable, as the revealing of meaning is rewarding in itself (Ramachandran & Hirstein, 1999). This has also been explicitly noted by Leder et al.’s model of visual aesthetic processing (Leder, Belke, Oeberst, & Augustin, 2004) and Carbon and Jakesch’s (2013) haptic aesthetic model.

The fact that changes in the elaboration of a stimulus result in changes in appreciation (Carbon & Leder, 2005; Faerber et al., 2010) reveals dynamics in processing that are not accounted for by mere exposure. While we might ask if processing during mere exposure is ever purely passive (concerning eye movements as well as concerning changes in perception and cognition) we cannot presume that it leads to higher fluency with repeated presentation in every case. We argue that the quality of elaboration might instead lie in the emergence of insights during elaboration, which might be linked to a temporally limited increase in fluency that even decreases again in the course of elaboration. This idea is in line with the claim by Ramachandran and Hirstein (1999) that the process of synchronisation of different activity patterns by ambiguous stimulation is itself rewarding. Similarly, it has been proposed within art theory and the perception science community that the detection of relationships or order (Hekkert & Leder, 2007), uniformity in variety (Berlyne & Boudewijns, 1971), or simplicity in complexity (Dickie, 1997; Reber et al., 2004) respectively might be enjoyable in themselves. Indeed, detectability of objects within Cubist artworks was recently shown to correlate strongly with liking (Muth, Pepperell, & Carbon, in press). On the basis of these lines of argumentation we claim that fluency of processing might not increase in a linearly progressive fashion by mere exposure, but along with insights during elaboration. Thus, perceptual Gestalt formation during the elaboration of difficult indeterminate pictures should increase their appreciation. We tested this hypothesis by tracking the dynamics of liking with regard to the detection of faces in indeterminate two-tone images that are difficult to process.

2. Methods

The major aim of the experiment was to test whether aesthetic appreciation benefits from insights during the elaboration of indeterminate stimuli. Two-tone images either containing a hidden Gestalt (i.e. a face) or not were repeatedly presented for half a second. Aha-insight moments of Gestalt detection were then related to the dynamics of liking ratings.

2.1. Preparation of material

Two pre-studies were conducted in order to evaluate and filter out a set of appropriate stimuli for the experiment. We used *Face* and *NonFace* stimuli. Pictures pertaining to the first category were based on photographs of faces taken from the website pixelio.de and the database of the Psychological Image Collection at Stirling (PICS). The original face was first blurred and then reduced to black and white so that recognition of the face was possible only after a period of elaboration [similar to so-called *Mooney faces* (1957); see Fig. 1].

Each of the *Face* pictures had a counterpart in the *NonFace* category that contained exactly the same elements arranged in a different non-facial composition by rotation and/or shift of parts of the face. In a first pre-study, six participants rated 98 stimuli (49 *Face* and *NonFace*, respectively) 11 times block-wise, after 500 ms of presentation on the question of whether they could detect a face in them, by pressing a key for either *yes* or *no*. Results showed that stimuli revealed faces too soon. Therefore the distance from the eyes to the screen was reduced from 40 to 30 cm in the experiment and random elements were added to the composition to make recognition harder. The face then appeared in the middle or at one corner of the picture so that the process of visual search was less efficient due to increased task demands. The possibility cannot be excluded that people interpreted unintended figural associations as faces. To reduce this risk, the composition of a stimulus was refined in cases when *NonFace* stimuli were reported to contain a face. Furthermore, an example of a face-pattern was given before the experiment. Instead of *yes* or *no* answers, the experiment used gradual scales for clearness of the face and similarity to a face to differ between recognition and guessing. Scaling also enabled a definition of ‘insight’ as the biggest difference between ratings for a stimulus in two succeeding blocks.

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