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Article *in* Personality and Social Psychology Review · March 2015

DOI: 10.1177/1088868315574978 · Source: PubMed

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Personality and Social Psychology Review
2015, Vol. 19(4) 395–410

DOI: 10.1177/1088868315574978
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A Dual-Process Perspective on Fluency-Based Aesthetics: The Pleasure-Interest Model of Aesthetic Liking

Laura K. M. Graf[1] and Jan R. Landwehr[1]

Abstract

In this article, we develop an account of how aesthetic preferences can be formed as a result of two hierarchical, fluency-based processes. Our model suggests that processing performed immediately upon encountering an aesthetic object is stimulus driven, and aesthetic preferences that accrue from this processing reflect aesthetic evaluations of pleasure or displeasure. When sufficient processing motivation is provided by a perceiver's need for cognitive enrichment and/or the stimulus' processing affordance, elaborate perceiver-driven processing can emerge, which gives rise to fluency-based aesthetic evaluations of interest, boredom, or confusion. Because the positive outcomes in our model are pleasure and interest, we call it the Pleasure-Interest Model of Aesthetic Liking (PIA Model). Theoretically, this model integrates a dual-process perspective and ideas from lay epistemology into processing fluency theory, and it provides a parsimonious framework to embed and unite a wealth of aesthetic phenomena, including contradictory preference patterns for easy versus difficult-to-process aesthetic stimuli.

Keywords

empirical aesthetics, processing fluency, dual-process theories, interest, pleasure, boredom, confusion, epistemic motivation, need for cognitive enrichment

> As a matter of fact, all perceptions which have formed the mental impression can again, given the circumstances, step out of these; only that specific external or internal reasons are required. This allows for the possibility, after the total impression, to thoroughly engage with the object in diverse though cohesive ways. This constitutes a second main component of the aesthetic appeal of the objects, which certainly does not rest exclusively on a unified total impression. This is, as it were, only the seed from which a plant similar to that from which it originated may flower out.
>
> —Fechner (1876, p. 112)[1]

As Gustav Theodor Fechner (1876) acknowledged in his seminal book *Vorschule der Aesthetik* (*Introduction to Aesthetics*), aesthetic appreciation can emerge following two hierarchical processing levels. First, aesthetic appreciation can be based on the initial "total impression" of an aesthetic object; second, aesthetic appreciation can accrue from an ensuing phase of object elaboration, for which the initial total impression represents no more than the "seed" of the subsequent aesthetic appeal. Obviously, this implies that aesthetic preference judgments can fundamentally disintegrate depending on which processing level underlies the judgment and that the difference in the underlying process is likely to give rise to qualitatively distinct aesthetic judgments.

Since Fechner's (1876) early treatises, a large body of theoretical and empirical research on aesthetics has accrued. However, the available research focuses mostly on only one of the two processing levels; aesthetic judgment is either conceptualized following the first level of aesthetic processing (e.g., fluency theory by Reber, Schwarz, & Winkielman, 2004) or the second, elevated processing level (e.g., Carbon & Leder, 2005; Millis, 2001). Alternatively, if more than one processing level is considered, several additional processing levels or steps are commonly postulated (e.g., Leder, Belke, Oeberst, & Augustin, 2004), thereby delineating aesthetic preference formation in a rather extensive way.

Moreover, most empirical studies measure very generic preference and liking judgments, which can only reflect the outcome of the preference formation process but not the particularity of the process (i.e., the underlying processing level). As such, it is not surprising that inconsistent preference patterns are empirically reported. That is, many studies

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find that aesthetic liking is a monotonically increasing function of processing ease (for a review, see Reber, Schwarz, & Winkielman, 2004). These findings, however, contradict a large body of research that links difficult-to-process stimulus characteristics such as complexity (e.g., Landwehr, Labroo, & Herrmann, 2011) or novelty (e.g., Hekkert, Snelders, & van Wieringen, 2003) with aesthetic preferences. These seemingly inconsistent findings may reflect the lack of a clear-cut understanding of the relationship between the two processing levels and the associated aesthetic evaluations.

Against this background, our key research aim is to develop a model of the process of aesthetic preference formation that, on one hand, depicts the richness of aesthetic preferences by accounting for both processing levels and, on the other hand, describes the processes on the most parsimonious grounds.[2] In developing our theoretical model termed the *P*leasure-*I*nterest Model of *A*esthetic Liking (PIA Model), our understanding of aesthetic appreciation and judgment will be guided by the Kantian notion of "disinterested interest" underlying judgments of aesthetic appreciation (Kant, 1790/1951). That is, unlike normal preference judgments, aesthetic preference judgments are "disinterested" in the sense that they do not involve a particular desire for the object as such. Importantly, the components with which we build our PIA Model are not new when considered in isolation. Rather, we combine current scientific knowledge to establish a state-of-the-art model of aesthetic preference judgments. Specifically, we combine the fluency theory of aesthetic pleasure (Reber, Schwarz, & Winkielman, 2004), which provides a parsimonious mechanism underlying aesthetic preference judgment, with a dual-process perspective from social psychology (e.g., Strack & Deutsch, 2004), which offers an established framework to study a phenomenon that can occur based on two fundamentally different processes.

Overall, we make at least three contributions to the literature on empirical aesthetics. First, we extend current theorizing on the processing fluency of aesthetics. In its current version, processing fluency explains only gut-level aesthetic preferences, that is, preferences that follow the first processing level. We introduce a second fluency-based process underlying aesthetic preferences, which refers to elaboration and reflection on a stimulus. That is, we propose an equally parsimonious mechanism underlying elaborate preference judgment. Second, we elucidate when people are likely to base their aesthetic preference judgment on which type of processing, thereby contributing to a richer understanding of the idiosyncrasy of aesthetic processing as "disinterested." More precisely, we propose that a person's motivation to engage in the second level of aesthetic processing is a joint function of stimulus-intrinsic and perceiver-intrinsic motivational components. Finally, we provide, for the first time, a theoretical coherent basis for aesthetic pleasure, aesthetic interest, and explicitly also the respective, often neglected negative counterparts aesthetic displeasure, aesthetic confusion, and aesthetic boredom. Given the variety of different understandings regarding these constructs, we therefore contribute to a clearer and more consistent definition of these aesthetic judgments, which we believe is especially valuable for future empirical investigations of aesthetic preferences.

The remainder of this article is structured as follows. We begin by reviewing the current literature on the psychology of aesthetics. In particular, we present two largely separate streams of research: aesthetic evaluations based on processing fluency and aesthetic evaluations based on cognitive elaboration of a stimulus. Because the type of processing underlying these distinct routes to aesthetic evaluation reflects the classical duality of mental processes as postulated by dual-process theories, we subsequently provide a brief overview of this established class of theories. In the main body of the article, we develop our PIA Model, which integrates these separate and partially contradictory theoretical perspectives into a coherent theoretical framework based on stimulus-based processing affordances and perceiver processing style. We conclude the article with a discussion of our framework and how it can enlighten theory, research, and practice.

Current Theoretical Accounts of Aesthetic Liking

The study of aesthetics and its determinants is commonly regarded as the second oldest discipline in experimental psychology (psychophysics being the oldest). Based on his book *Vorschule der Aesthetik* (*Introduction to Aesthetics*), Gustav Theodor Fechner (1876) is considered the founding father of this field of research. He termed this field "experimental aesthetics" to emphasize his aspiration to use a rigorous methodology and to uncover relationships between objective stimulus properties and aesthetic responses. An important contributor to the field was Daniel E. Berlyne (1971, 1974), who was among the first to examine the underlying mechanism responsible for aesthetic responses based on a coherent theoretical framework. In his research program called "the new experimental aesthetics," he proposed physiological arousal potential as the key mediating mechanism between objective stimulus properties and aesthetic responses based on an inverted U-shaped relationship. His ideas and empirical findings had a lasting impact on the field of empirical aesthetics and have only recently been challenged and refined by another process-oriented framework: the processing fluency approach to aesthetic pleasure (Reber, Schwarz, & Winkielman, 2004).

Processing Fluency and Aesthetic Liking

The most recent approach to the underlying mechanism of aesthetic preferences that has gained substantial consideration in the scientific community was proposed by Reber, Schwarz, and Winkielman (2004). Their framework inspired the work of many other researchers in the field of psychological aesthetics (e.g., Albrecht & Carbon, 2014; Belke,

Leder, Strobach, & Carbon, 2010; Forster, Leder, & Ansorge, 2013) and in applied fields of research, such as product design (e.g., Landwehr et al., 2011; Landwehr, Wentzel, & Herrmann, 2013). The framework's key propositions are that (a) depending on an object's visual properties and a beholder's prior processing experience with the object, processing of the object will be experienced as more or less fluent; (b) the experience of processing fluency directly feels good on an affective level; and (c) as long as the positive affect is not attributed to a different source, it enters the aesthetic evaluation of the object, leading the observer to aesthetically like the object (Reber, Schwarz, & Winkielman, 2004). One of the reasons fluency theory enjoys such great popularity in research on aesthetics is that it allows for the derivation of clear-cut predictions about the relationship between concrete stimulus characteristics and aesthetic liking. For instance, in support of a monotonic positive relationship between fluency and liking, objective stimulus properties such as contrast or clarity (e.g., Reber, Winkielman, & Schwarz, 1998, Study 2; Reber, Wurtz, & Zimmermann, 2004) and symmetry (Reber, 2002; Wurtz, Reber, & Zimmermann, 2008), which should facilitate information processing, have been shown to increase aesthetic liking. In addition to these inherent stimulus characteristics, a perceiver's history with a stimulus is proposed to increase his or her processing fluency and thus his or her aesthetic liking. In this regard, typicality (e.g., Halberstadt, 2006; Winkielman, Halberstadt, Fazendeiro, & Catty, 2006), repeated exposure (Bornstein & D'Agostino, 1994), exposure duration (Reber et al., 1998, Study 3), and perceptual priming (Reber et al., 1998, Study 1) have been found to increase aesthetic liking.

Despite the comprehensive empirical evidence for a positive relationship between fluency and aesthetic liking, a number of findings challenge key propositions of a fluency approach to aesthetics. First, several studies have found a positive effect of novelty (e.g., Blijlevens, Carbon, Mugge, & Schoormans, 2012; Hekkert et al., 2003) or visual complexity (e.g., Landwehr et al., 2011; Martindale, Moore, & Borkum, 1990) on aesthetic liking. However, from a fluency perspective, novelty and complexity are believed to decrease processing fluency and are therefore expected to decrease aesthetic liking.[3] Next, several studies also suggest inverted U-shaped relationships between processing fluency and aesthetic liking (e.g., Berlyne, 1970; Bornstein, Kale, & Cornell, 1990; Hekkert et al., 2003; Landwehr et al., 2013; Miller, 1976; Van den Bergh & Vrana, 1998; see also Bornstein, 1989). Again, these findings challenge one of fluency theory's key propositions, according to which one would expect to observe only monotonically increasing relationships between processing fluency and aesthetic liking. In sum, although the accumulated empirical results show solid evidence for the relationship between fluency and aesthetic liking, there is also evidence for the opposite relationship between disfluent processing and aesthetic liking, which is difficult to explain with the foundational version of the fluency account.

Cognitive Elaboration and Aesthetic Liking

In contrast to the previously described fluency approach, other researchers in the field of empirical aesthetics conceptualize aesthetic liking as resulting from perceivers' active elaboration of a stimulus (e.g., Armstrong & Detweiler-Bedell, 2008; Carbon & Leder, 2005; Muth & Carbon, 2013). That is, a perceiver is proposed not to react passively to a stimulus, as in the fluency approach, but instead to interact actively with the stimulus to gain a deeper understanding of it. For instance, active processing triggered by requiring participants to evaluate stimuli on several dimensions has been shown to affect appreciation of car interiors (Carbon, Faerber, Gerger, Forster, & Leder, 2013; Carbon & Leder, 2005; Faerber, Leder, Gerger, & Carbon, 2010) as well as exterior designs (Landwehr et al., 2013). Importantly, these studies found that only novel/innovative (e.g., Carbon & Leder, 2005) and atypical (Landwehr et al., 2013) designs benefit from elaboration. Other studies using paintings as stimuli manipulated elaboration by providing supplementary information in the form of titles (Leder, Carbon, & Ripsas, 2006; Millis, 2001) and/or stylistic or descriptive information (Belke, Leder, & Augustin, 2006; Russell, 2003), showing that the appreciation of pictures can be enhanced through elaboration—provided that the quality of the elaboration is meaningful. Overall, the sum of the findings suggests a positive relationship between elaboration and aesthetic liking on the condition that the stimulus holds the appropriate elaboration affordance. Presumably, such an elaboration affordance, or the opportunity for elaborate processing offered by an aesthetic stimulus (see Gibson, 1979/1986), is closely related to an initially disfluent processing. Hence, the inconsistent evidence with respect to the relationship between processing fluency and aesthetic liking may be because fluency theory in its basic version does not cover the possibility that people may take an active role in processing a stimulus, which may lead to aesthetic liking of initially disfluent stimuli (i.e., stimuli with elaboration affordance). Because generic preference and liking judgments are broad and ambiguous without tapping into the process responsible for judgment (Silvia, 2005b), seemingly inconsistent preference patterns for both fluent and disfluent aesthetic stimuli can empirically occur. A better understanding of the different types of processes responsible for aesthetic judgments would potentially resolve these empirical contradictions and allow for theoretical advancement.

Dual-Process Theories of Human Information Processing

Based on the presented evidence and the above considerations, it appears that aesthetic liking can be the product of two distinct processes that differ fundamentally in the way the perceiver engages in the processing of the stimulus. Specifically, aesthetic liking arising from the first process is based on stimulus-driven fluent processing that precludes

deeper elaboration. Alternatively, aesthetic liking can arise from the interaction of stimulus-based processing affordances and perceiver-driven elaboration. According to our view, this dichotomy in terms of processing most fundamentally mirrors the duality of mental processes as postulated by a class of theories that shaped and guided a large body of research in cognitive and social psychology during the last three decades: the Dual-Process Theories (Chaiken & Trope, 1999). The core defining nature of these theories is that they divide the realm of mental processes into two general categories or types of processing, to which they ascribe diametrical properties (Gawronski & Creighton, 2013).

In this respect, almost all theories agree on a distinction between cognitive processes that are unconscious, rapid, automatic, and high in capacity and those that are conscious, slow, deliberative, and limited in capacity (Evans, 2008). This distinction is rooted in the assumption that processing can operate either automatically or in a controlled fashion (Gawronski & Creighton, 2013). In social cognition, processes are considered automatic if they are (a) unintentional, (b) efficient or effortless, (c) uncontrollable, and/or (d) unconscious (Bargh, 1994). Because a process rarely meets all four of these criteria (Bargh, 1992), authors have suggested diverse headings for the two types of thinking that they contrast depending on which features of automaticity they aim to emphasize (e.g., reflective vs. impulsive by Strack & Deutsch, 2004; systematic vs. heuristic by Chaiken, 1987; experiential vs. rational by Epstein, 1994).

Within their respective distinctions, most dual-process models provide extensive descriptions of each processing style. However, few models devote attention to exactly when people adopt a particular processing style (Alter, Oppenheimer, Epley, & Eyre, 2007). Nevertheless, all theories would presumably agree that controlled processing is activated when people have both the motivation and the ability to engage in effortful processing (Smith & DeCoster, 2000; Strack & Deutsch, 2004).

Despite these agreements, there are substantial differences with respect to how the two types of processes are assumed to relate to each other (Smith & DeCoster, 2000). In particular, some authors propose an architecture that has a parallel-competitive form (e.g., Sloman, 1996; Smith & DeCoster, 2000), whereas others advance a default-interventionist structure (e.g., Evans, 2006; Kahneman & Frederick, 2002). Parallel-competitive forms assume that both types of processing occur in parallel and compete for a response (Evans & Stanovich, 2013). Default-interventionist forms, in contrast, propose that automatic type processing generates intuitive default responses upon which subsequent controlled processing may approve or intervene. In accordance with the accumulated insights on dual-process models, which are convincingly summarized in a recent review by Evans and Stanovich (2013), the latter default-interventionist perspective will guide our subsequent theorizing.

The presented dual-process perspective has been amply used to integrate and explain diverse phenomena such as persuasion (e.g., Chaiken, 1980; Petty & Cacioppo, 1986), social behavior (Strack & Deutsch, 2004), causal attribution (e.g., Gilbert, 1989), and many others (see Gawronski & Creighton, 2013, for a recent review). Surprisingly, no research thus far has adopted this perspective toward aesthetic processing to explain the phenomenon of aesthetic preferences. This is precisely the aim of our framework.

The PIA Model

We will now present a dual-process perspective on fluency theory that explains the formation process of aesthetic preferences and takes into account that people may process aesthetic stimuli not only passively but also actively and elaborately. Importantly, we will delineate the whole process of aesthetic preference formation, including negative outcomes. Because the two positive outcomes of the distinct processes are conceptualized as aesthetic pleasure and aesthetic interest, we call our framework the *P*leasure-*I*nterest Model of *A*esthetic Liking (PIA Model).

For clarity, we will structure the description of our PIA Model (see Figure 1) in four theses. In the first instance, basic properties and functions of the PIA Model will be discussed (Thesis 1). Subsequently, aesthetic evaluation based on automatic processing is elucidated (Thesis 2), followed by an explanation of the conditions required for the activation of controlled processing (Thesis 3). Finally, we will explain the formation of controlled processing-based aesthetic evaluation (Thesis 4).

PIA Model Thesis 1: Dual-Process Distinction and Processing Fluency

In accordance with the most elementary distinction of mental processes into those that operate automatically and those that are controlled (Gawronski & Creighton, 2013), we differentiate the two types of aesthetic processing by calling them "automatic" versus "controlled." Below, we will first elaborate on the features of automaticity and control that constitute our PIA Model. Afterward, we relate the two types of aesthetic processing to the concept of fluency.

Automatic processing. We suggest that when an aesthetic stimulus is encountered, it will immediately be processed automatically (see upper part of Figure 1). That is, automatic stimulus processing is mandatory; it occurs without a perceiver's intention to do so (see Bargh, Chaiken, Govender, & Pratto, 1992; Bargh, Chaiken, Raymond, & Hymes, 1996) and without requiring the perceiver to invest considerable amounts of cognitive capacity (i.e., demands on working memory resources are minimal, Evans & Stanovich, 2013). This automatic processing is mainly stimulus driven and

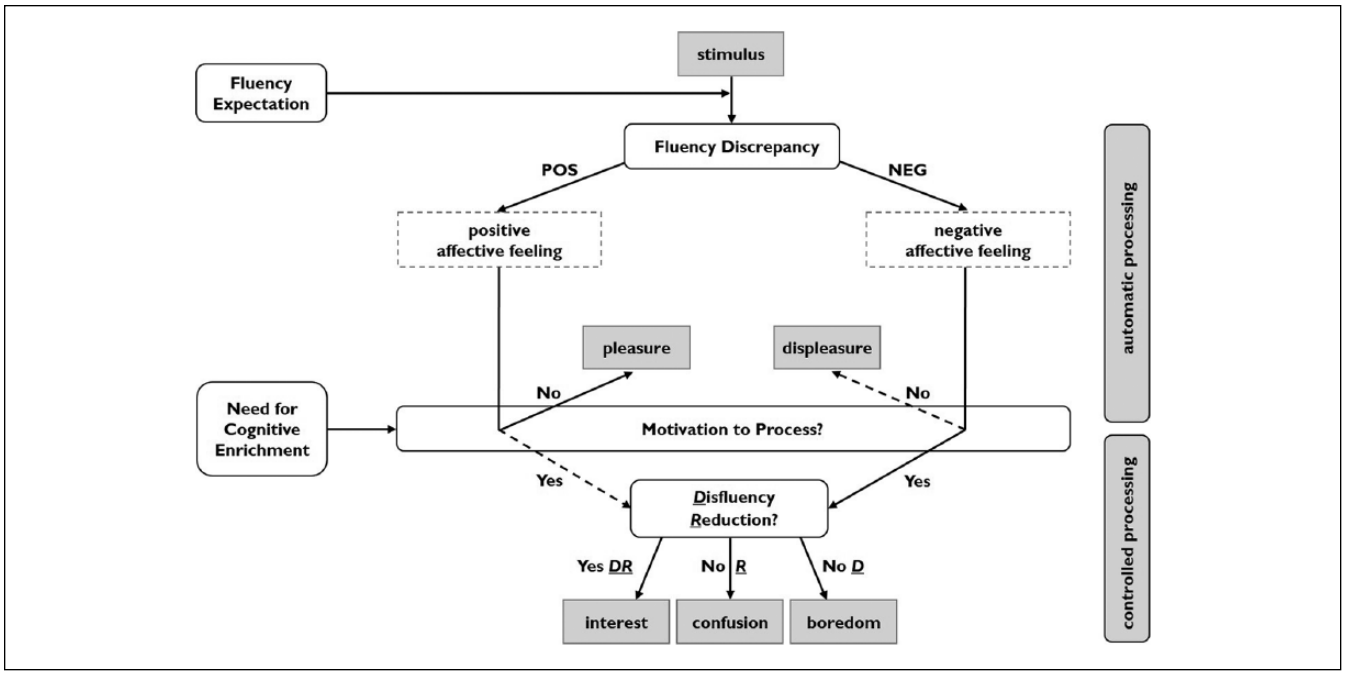

Figure 1. Overview of the PIA Model.
Note. PIA Model = *P*leasure-*I*nterest Model of *A*esthetic Liking.

reactive, which is effectively expressed in the metaphor of the perceiver on "autopilot," who processes incoming information without actively adapting any aspects of the internal cognitive structures (Bargh & Chartrand, 1999). Moreover, this type of processing usually encompasses processing of the stimulus as a whole without a detailed assessment of individual features (Cupchik, 1994). Despite being independent of active deliberation about the stimulus, this rudimentary and early processing has been shown to be intimately associated with an affective reaction (see Strack & Deutsch, 2004; Winkielman & Cacioppo, 2001; Zajonc, 1980). Convincing empirical evidence has been provided for affective reactions without extensive perceptual and cognitive elaboration, such as research conducted within the mere exposure paradigm, which shows that affective reactions toward stimuli are evoked outside of conscious awareness and independent of cognitive resources (Janiszewski, 1993; Kunst-Wilson & Zajonc, 1980; Murphy & Zajonc, 1993). More generally, Robert Zajonc (1980) coined this key characteristic of the automatic system with his famous statement "preferences need no inferences."

Controlled processing. Following our conception of automatic processing as unintentional and mandatory, automatic processing is the default type of aesthetic stimulus processing. However, if a stimulus receives sufficient attention by a perceiver, controlled processing may subsequently be activated and overwrite the automatic response (see lower part of Figure 1; see Evans & Stanovich, 2013). We conceptualize controlled aesthetic processing as higher order cognitive processing associated with detailed and deliberate stimulus analysis, meaning assignment, and interpretation (see Leder et al., 2004) that requires high amounts of cognitive capacity (i.e., it demands working memory resources; Evans & Stanovich, 2013).

In contrast to automatic processing, controlled processing is perceiver driven. More precisely, whereas automatic processing may be understood as the type of processing associated with "passive exposure" to a stimulus, controlled stimulus processing refers to an active and reflective interaction with the stimulus (see Muth & Carbon, 2013). This active interaction may involve the perceiver not only becoming acquainted with the stimulus (as in the case of automatic processing) but also potentially learning about his or her own cognitive structures for stimulus processing, which may lead to an adaptation or updating of these structures during the course of controlled processing.

Fluency of automatic and controlled processing. Current research in cognitive psychology suggests that people constantly experience the working of their ongoing cognitive operations (e.g., perceiving, processing, and generation of information; Unkelbach & Greifeneder, 2013a) and that this working is reflected in an integrative experience or feeling of fluency (Greifeneder & Unkelbach, 2013). It is generally assumed that the working of mental processing translates into feelings of fluency due to an internal monitoring system that continuously screens how mental processing proceeds (Mazzoni & Nelson, 1998; Metcalfe & Shimamura, 1994; Whittlesea & Williams, 2000). This feeling of fluency encompasses the full continuum from disfluency to fluency, mirroring the

subjective difficulty or ease associated with mental processing (Alter & Oppenheimer, 2009). In line with this general understanding, we understand fluency as an integrative and general experience that summarizes the ongoing mental activity of processing an aesthetic stimulus (see Reber, Wurtz, & Zimmermann, 2004).

Despite being an integrative experience, fluency may characterize mental processing that occurs at different levels (see Reber, Schwarz, & Winkielman, 2004). In this regard, the current literature distinguishes between perceptual and conceptual fluency. Whereas perceptual fluency is concerned primarily with identifying the physical identity of a stimulus, conceptual fluency is concerned primarily with stimulus meaning and the relation to semantic knowledge structures (Reber, Schwarz, & Winkielman, 2004; Reber, Wurtz, & Zimmermann, 2004). Although perceptual and conceptual fluency are influenced by different variables, available research suggests that the effects of perceptual and conceptual processing manipulations tend to result in a similar signal of "general fluency" (Reber, Schwarz, & Winkielman, 2004; Winkielman, Schwarz, Fazendeiro, & Reber, 2003). According to our understanding, both automatic and controlled processing are potentially subject to perceptual and conceptual fluency (presumably, the proportion of perceptual relative to conceptual fluency is higher for automatic processing, whereas the opposite applies for controlled processing).

Importantly, however, our differentiated conceptualization of automatic processing as stimulus driven and controlled processing as perceiver driven implies that fluency's informative value is likely to differ between the two types of aesthetic processing (see Alter & Oppenheimer, 2009). That is, for automatic processing, fluency is mainly informative about the "external world" (i.e., about the ease or difficulty of processing the visual characteristics of a stimulus). In contrast, because controlled processing involves deliberate perceptual and conceptual engagement with a stimulus, the fluency of controlled processing is informative not only about the stimulus itself but also about one's own cognitive structures and ability to handle the stimulus. Hence, for controlled processing, a feeling of (dis-)fluency is not attributed to the stimulus per se but rather to the perceiver's interaction with the stimulus.

PIA Model Thesis 2: Automatic Processing-Based Aesthetic Evaluations

We propose that perceivers only experience the fluency of their automatic processing if it is discrepant from their expected fluency. This fluency discrepancy can be positive or negative (see Figure 1), and we argue that the direction of this discrepancy is reflected in a positive or negative affective feeling. Furthermore, if stimulus processing ends with automatic processing, the affective feeling will translate into judgments of aesthetic pleasure or displeasure. In the remainder of this section, we discuss the concept of fluency discrepancy, its relation to affective feelings, and the link between affective feelings and aesthetic evaluations.

The concept of fluency discrepancy. The idea that the fluency signal is only informative when it is not anticipated has received considerable attention (e.g., see Hansen & Wänke, 2013). In fact, a signal needs to deviate from the surrounding context by definition. Likewise, experienced fluency needs to disrupt the ongoing mental experiences to be informative (Dechêne, Stahl, Hansen, & Wänke, 2009). Research by Dechêne et al. (2009) on the mere exposure effect demonstrates this notion. In one of their studies, 40 Kanji characters were randomly selected from a list of 120 characters and presented subliminally to participants. Next, participants rated the attractiveness of the stimuli; one group of participants rated 20 old and 20 new characters, and the other group judged only the 40 old characters. Only when the old stimuli were mixed with the new stimuli such that the fluency of the old stimuli stood out against the new stimuli could the typical mere exposure effect be replicated; the fluent (i.e., the old) characters were liked better.

Generally, it is suggested that the standard of comparison for the experience of fluency presents itself in two main variants (Hansen & Wänke, 2013). The first variant is the perceiver's expectation regarding the fluency of processing based on prior experience with the stimulus or the class of stimuli to which the stimulus belongs. Second, the actual situation in which processing happens may prime an expectation. We acknowledge that expectations are frequently a joint function of these two determinants, and we suggest subsuming both determinants under the general concept of "fluency expectation." Hence, we propose that if the actual experienced fluency is higher (lower) than the fluency expectation, a positive (negative) fluency discrepancy results (see Figure 1).

Link between fluency discrepancy and affective feelings. We propose that positive fluency discrepancy triggers positive affect (upper left part of Figure 1) and that negative fluency discrepancy triggers negative affect (upper right part of Figure 1). Our theoretical reasoning represents a direct extension of the established notion of why high fluency is positively marked, which states that fluency elicits positive affect because it is associated with progress toward the successful recognition and interpretation of a stimulus (see Reber, Schwarz, & Winkielman, 2004). This explanation builds on the argument that affective states play an important regulative function in goal-directed behavior and that they reflect differences between expected and experienced rates of movement toward goals (Carver & Scheier, 1990). According to this theoretical perspective, however, people do not assess whether they are making progress per se, but they monitor their rate of progress against a reference value (i.e., against an expected rate of progress). Positive affect results

only if progress occurs at a rate that is higher than the standard. In contrast, if the rate of progress is lower than the standard, this leads to negative affect. Finally, when the rate of progress occurs at a rate that was expected based on the standard, no affective reaction is elicited. Assuming that fluency discrepancy is the subjective cue that informs the perceiver about his or her rate of progress (see Efklides, 2006), the direction and size of the affective feeling are a function of the amount of the discrepancy between actual and expected fluency (see Carver & Scheier, 1990).

Empirical evidence for the link between fluency and affect has been provided by measuring participants' affective feelings toward briefly presented stimuli using facial electromyography (fEMG; for example, Harmon-Jones & Allen, 2001; Winkielman & Cacioppo, 2001; Winkielman et al., 2006). In studies by Winkielman and Cacioppo (2001), for instance, participants saw everyday objects that varied in fluency while their fEMG activity was recorded. The results suggest that higher fluency is associated with stronger activity over the zygomaticus region (indicative of positive affect), but that lower fluency is not associated with activity over the corrugator region (indicative of negative affect). In contrast, Topolinski, Likowski, Weyers, and Strack (2009) demonstrate that disfluency can also be linked to negative affect. The researchers manipulated the processing fluency of word triads by hidden semantic coherence.[4] In the high fluency condition, the triad had a common remote associate (e.g., SALT, DEEP, FOAM implying SEA; coherent triad); in the low fluency condition, it did not (e.g., DREAM, BALL, BOOK; incoherent triad). Although the participants were unaware of the underlying semantic structure, their faces showed higher activity of the frowning muscle corrugator, which is connected with negative affect, after reading incoherent compared with coherent word triads.

In the reading of our PIA Model, the mixed empirical findings regarding the affective pattern of fluency may be explained by considering whether participants' fluency discrepancy was positive or negative. Specifically, in the studies that found no corrugator muscle activity, participants were shown pictures of everyday objects that varied in fluency manipulated through visual priming (Study 1; Winkielman & Cacioppo, 2001) and presentation duration (Study 2; Winkielman & Cacioppo, 2001), female faces that varied in fluency through repeated exposure (Harmon-Jones & Allen, 2001), or geometrical figures that varied in prototypicality (Winkielman et al., 2006). Hence, it is likely that these studies manipulated the fluency of operations that already run fluently (Topolinski et al., 2009), which is why processing in the "low" fluency conditions did not disrupt participants' common visual habits and expectations and thus was not disfluent (i.e., the manipulations occurred only in the more or less fluent range, such that there was always positive fluency discrepancy).

In support of our proposition that disfluent processing may indeed trigger a negative affective feeling, neuroimaging and electrophysiological data show that signals of cognitive error or violations of expectations trigger negative affect (Derryberry & Tucker, 1994; Fernandez-Duque, Baird, & Posner, 2000). Furthermore, following the logic that the link between fluency and facial affective feedback also works in the opposite direction (facial feedback hypothesis), there is even more support for the assumption that low fluency, that is, a negative fluency discrepancy, elicits negative affect. For instance, it has been shown that experimentally induced negative facial activity (asking participants to furrow their brows) triggers the experience of low fluency, as reflected in increased reports of difficulty on a task that was conducted simultaneously (Larsen, Kasimatis, & Frey, 1992). Finally, this idea also converges with observations that mental states characterized by low coherence, such as cognitive dissonance, tend to be affectively negative (Devine, Tauer, Barron, Elliot, & Vance, 1999; Harmon-Jones, 2000; Losch & Cacioppo, 1990).

Link between affective feelings and pleasure or displeasure. The above considerations suggest that affective feelings are linked to fluency, construed as the by-product of automatic stimulus processing. The next important question pertains to how this processing-based affective feeling influences a perceiver's interaction with a stimulus. We reason that when the situation is such that controlled processing is not activated and the perceiver abandons his or her interaction with the stimulus based on automatic processing, he or she will transfer the affective feeling to the stimulus (see Thesis 3 for a detailed elaboration on when controlled processing is initiated; Schwarz & Clore, 1983, 1996). That is, a perceiver "discharges" his or her processing-based affective feeling to the stimulus, which is why the aesthetic response will most closely be reflected in judgments of aesthetic pleasure or displeasure. In fact, our conceptualization of aesthetic pleasure fits well with the definition as a "pleasurable subjective experience that is directed toward an object and not mediated by intervening reasoning" (Reber, Schwarz, & Winkielman, 2004, p. 365). Accordingly, we define aesthetic displeasure as a displeasing subjective experience that is directed toward an object and not mediated by intervening reasoning. Hence, the amount of pleasure and displeasure should be a direct function of the processing-based affective feeling. In contrast, if stimulus-driven automatic processing is followed by perceiver-driven controlled processing, the affective feeling is not attributed to the stimulus but channels the motivation to process the stimulus controlled, as we will discuss in the following Thesis 3.

PIA Model Thesis 3: Activation of Controlled Processing

As stated earlier, controlled processing requires high amounts of cognitive capacity, which is why the perceiver needs to be both able and motivated to make these cognitive investments (Alter et al., 2007). This postulate is in line with almost every other dual-process model and explicitly recognizes that people

are neither able nor motivated to carefully and deliberately scrutinize every stimulus to which they are exposed. We assume that ability is present in the usual situations in which people consider an object's aesthetics, but that the motivation to process requires sufficient stimulus-intrinsic and perceiver-intrinsic motivational forces (see middle part of Figure 1).

Stimulus-intrinsic trigger of the motivation to process: Fluency-based affective feeling. In the realm of aesthetics, theoretical and empirical research has focused on fluency's informative value, that is, on fluency as the informational foundation of aesthetic appreciation (see Reber, Schwarz, & Winkielman, 2004). In fact, our conceptualization of automatic processing-based aesthetic responses builds on this informative function of fluency. In addition to such direct uses of fluency as information, recent research in the context of problem solving and the detection of semantic distortions has shown that fluency changes downstream cognitions (Unkelbach & Greifeneder, 2013b). These investigations suggest that feelings of disfluency may serve as a cue that leads people to adopt a systematic approach to information processing, whereas fluency leads to more superficial processing (Alter, Oppenheimer, & Epley, 2013; Alter et al., 2007; Song & Schwarz, 2008; Thompson et al., 2013; see also Alter, 2013; Bullot & Reber, 2013; Schwarz, 2004).

Based on the above considerations and in line with our reasoning on why fluency is affectively marked (see Thesis 2), we suggest that the fluency-based affective feeling regulates subsequent processing. That is, a negative affective feeling works as a signal that "you are doing worse than you expected to do." Thus, it informs a perceiver that more effort should be invested in the processing of a stimulus (Carver, 2003). In contrast, a positive affective feeling points to a state in which one is "doing better than expected," which leads to reduced subsequent processing efforts (Carver, 2003). Therefore, similar to the influence of mood and affective states on processing style, a negative fluency-based affective feeling is assumed to trigger controlled processing, whereas a positive fluency-based affective feeling is likely to bring the cognitive activity to completion on the basis of automatic processing (see Unkelbach & Greifeneder, 2013b).

Perceiver-intrinsic trigger of the motivation to process: Need for cognitive enrichment. Although we presume a negative affective feeling to be a catalyst and a positive affective feeling to be an inhibitor of a shift toward controlled processing, the idiosyncrasy of aesthetic judgments as being "disinterested" (Kant, 1790/1951) implies that the motivation to process an aesthetic stimulus cannot be fueled by a desire for the object as such but only by an "abstract" desire to possess knowledge about the object (for a similar argument, see Armstrong & Detweiler-Bedell, 2008). Hence, we propose that the disinterestedness of aesthetic judgments implies that whether a perceiver engages in controlled processing is dependent on whether his or her desired knowledge state regarding a stimulus has already been reached on the basis of the available evidence provided by automatic processing.

Kruglanski's (1990) theory of lay epistemics addresses the process whereby human knowledge is formed and modified and provides a useful framework to analyze people's motivation to reach certain knowledge states. According to Kruglanski, a person's tendency to generate new knowledge about a phenomenon depends on that person's epistemic motivation. Epistemic motivation depends, among other things,[5] on a person's need for cognitive closure, which varies along a continuum anchored at one end by a high need for cognitive closure and at the other end by a need to avoid cognitive closure (Kruglanski & Webster, 1996). When the need for cognitive closure is high, people have a desire to reach quick conclusions regarding a topic, whereas a low need for cognitive closure corresponds to a desire to achieve a rich, well-developed and accurate conclusion about a topic (De Dreu, Nijstad, & van Knippenberg, 2008).

In the present context, we reason that the concept of the need for cognitive closure affects whether people are content with a knowledge state of a stimulus that is based on their preexisting knowledge structures or whether they have the need to attain a knowledge state that is based on an optimal adaption and revision of their knowledge structures to the stimulus. Because we are explicitly concerned with explaining when people are motivated to revise and adapt their knowledge structures to the stimulus (i.e., with a low need for cognitive closure), we prefer to speak of a "need for cognitive enrichment." Thus, because stimulus knowledge formed by preexisting knowledge structures follows directly from automatic processing, we suggest that a need for cognitive enrichment will increase people's tendency not to "freeze" on this available knowledge but to engage in adapting and revising their knowledge structures to the demands of the stimulus. Because this is only feasible with controlled processing, a need for cognitive enrichment will trigger the motivation for controlled processing.

Motivation to process as a joint function of stimulus-intrinsic and perceiver-intrinsic motivational forces. Based on the above considerations, we propose that a perceiver's motivation to process a stimulus in a controlled way is determined by the interplay of the perceiver's need for cognitive enrichment and the fluency-based affective response to the stimulus. If a person experiences a negative affective feeling and a high need for cognitive enrichment, the motivation for controlled processing will be high and controlled processing is activated (see Figure 1; drawn through path from the negative affective feeling down to "*D*isfluency *R*eduction?"). At the other extreme, the combination of a positive affective feeling and a low need for cognitive enrichment implies a low motivation to process, and controlled processing will not be initiated (see Figure 1; drawn through path from the positive affective feeling up to aesthetic pleasure). In cases where the

affective feeling and the need for cognitive enrichment have opposing effects (positive affective feeling/high need for cognitive enrichment, negative affective feeling/low need for cognitive enrichment), we suggest that the motivation to process in a controlled way depends on the relative strength of the stimulus-intrinsic and perceiver-intrinsic motivational triggers. If the motivational force of the need for cognitive enrichment transcribes the motivational effect of the affective feeling, the dashed paths will take effect (see Figure 1).

PIA Model Thesis 4: Controlled Processing-Based Aesthetic Evaluations

We characterized controlled stimulus processing as deliberate, perceiver-driven stimulus processing and fluency as the feeling that reflects the ease or difficulty of this type of processing. In the following, we will begin by characterizing the informative value of controlled processing fluency for aesthetic judgment, that is, the idea of disfluency reduction (see Figure 1). Afterward, we will discuss the links of disfluency reduction to interest, confusion, and boredom.

The concept of disfluency reduction. Stimulus-driven automatic processing occurs quite quickly, and the perceiver experiences only a specific level of processing fluency that is mainly informative about the considered stimulus. However, perceiver-driven controlled processing is much more elaborate and can occur for an extended period of time. Therefore, the perceiver is assumed to experience not just one specific level of fluency but rather a continuous and most likely fluctuating feeling of fluency. Importantly, the perceiver will monitor the gradient of this feeling in addition to the absolute level because in the controlled processing mode, the perceiver is interested in learning something about the capabilities of his or her cognitive system when handling aesthetic stimuli. Hence, the increase or decrease of the fluency experience is critical for assessing the progress of adapting one's own cognitive structures.

Again, we would assume that this fluency delta is not assessed in isolation but against a processing expectation that is formed during the first few moments of controlled processing. In particular, because controlled processing considers more details than automatic processing, the initial controlled fluency level may differ from the automatic fluency level. For instance, a stimulus that superficially seemed fluent during automatic processing may contain complex, difficult-to-process details that are only detected during controlled processing. In contrast, a superficially atypical stimulus may be easy to integrate into existing knowledge structures when processed in a more controlled way. Once an updated fluency level (of course, the initial controlled fluency level may also match the automatic fluency level) is experienced, this level constitutes the processing expectation that is used to evaluate the subsequent fluency delta. Depending on the level of processing expectation and the size of the delta, three distinct aesthetic evaluations will be discussed: aesthetic interest, aesthetic confusion, and aesthetic boredom.

Link between disfluency reduction (Yes DR) and interest. If controlled processing is less difficult than expected (i.e., people perceive a positive delta of their fluency feeling), this should result in a positive affective feeling because it implies an increase in the effectiveness of processing the stimulus. Importantly, we reason that whereas people attribute the positive affective feeling to the stimulus during automatic processing, they will ascribe it to the process of interaction during controlled processing. Thus, people relate the feeling to their successful efforts in increasing the effectiveness of their processing. This important difference implies that the positive, fluency-based affective feeling is most closely reflected in a judgment of aesthetic interest rather than simple pleasure. In fact, educational research has empirically shown that positive affect after working on cognitive tasks increases interest in the task (Efklides & Petkaki, 2005). Csikszentmihalyi (1990) similarly suggests that when a person makes progress toward a challenging goal by investing psychic energy and attention, this results in an experience of flow, whereas pleasure does not require the investment of psychic energy or effort. Finally, our proposition advancing interest as the "controlled counterpart" of automatic pleasure seems to be in line with Berlyne's (1971) understanding, in which interesting stimuli are those whose arousal potential are within the aversive range but permit relatively prompt arousal reduction through perceptual and intellectual processing. Pleasing stimuli, by contrast, are apprehended so quickly that there is no disorientation to be relieved.

The idea that increases in fluency, or the reduction of disfluency, due to stimulus elaboration have positive effects on aesthetic appreciation is also empirically supported (Muth & Carbon, 2013; Muth, Pepperell, & Carbon, 2013). Muth and Carbon (2013), for instance, analyzed whether aesthetic appreciation benefits from perceptual insights, also referred to as the "Aesthetic Aha Effect," during the elaboration of indeterminate stimuli. Two-tone images either containing or not containing a hidden Gestalt (i.e., a face) were repeatedly presented to participants, and Aha-insight moments of Gestalt detection and liking ratings were captured alternately. The results show that participants who gained insight into the face-like appearance showed strongly increased liking in a subsequent block of liking ratings (i.e., liking increased only directly after an insight).

Similarly, Aha-insight moments have been described as sudden experiences of processing ease with respect to a problem solution (Topolinski & Reber, 2010). Although it is less clear whether there are distinctive Aha-insight moments when people elaborate in an autonomous manner and, if there are, how they integrate into a more sustained fluency experience, the findings support our claim that the appreciation of initially disfluent stimuli can benefit from elaboration. Finally, our proposition that the reduction of disfluency

is affectively positive is strongly related to the proposal by Van de Cruys and Wagemans (2011), according to which the contrast effect associated with the transition from a state of uncertainty to a state of increased predictability is rewarding.

Importantly, we suggest that for fluency-based positive affective feelings to be reflected in aesthetic interest, the goal of having successfully understood the stimulus must not be finally achieved. We propose that people draw on the fluency experience associated with their mental processes to assess whether they have achieved this goal; when they perceive no further fluency increases (i.e., processing is not becoming any easier), they will regard their target as achieved. Stated differently, as long as people experience disfluency reduction/fluency increases, they will be interested because the prospect of future positive affective feelings is motivating. That is, we strongly associate interest with the motivation for further exploration and information seeking with respect to a stimulus (Silvia, 2005a, 2005c). Because a stimulus, whose disfluency potential has been completely reduced by controlled processing, satisfies the need to enrich one's own knowledge structures, it will not trigger controlled processing during subsequent encounters and can thus become an aesthetically pleasant stimulus based on its gained processing fluency.

The proposition that interest requires the prospect and the potential to learn new things about an aesthetic stimulus is supported by Silvia's (2005a, 2005c) appraisal theory of interest, which suggests that interest consists of an appraisal of novelty, followed by an appraisal of coping potential. In one study by Silvia (2005c), participants provided self-reports on trait curiosity, openness to experience, and appraisals of their ability to understand complex and abstract art. Then, the participants were presented with random polygons that ranged from simple to complex, but their instructions were manipulated. One group had to select the polygon they found most pleasant, whereas the other group had to identify the polygon they found most interesting. Silvia (2005c) found that an appraisal of the ability to understand complex art significantly predicted the complexity of the most interesting polygon but not of the most pleasant polygon. In addition, as people felt more able to understand complex art, they selected highly complex polygons as the most interesting. Thus, interest arises when people have the feeling that they can learn more about a stimulus. Finally, the different pattern with respect to pleasure and interest also suggests that the two are different outcomes and that pleasure is a backward-oriented response that is not associated with the motivation for further exploration of the target, whereas interest also has a forward-oriented character related to the motivation for learning.

Notably, Silvia's (2005c) appraisal approach to interest may be understood within the tenets of our PIA Model. Specifically, understanding a novelty appraisal check as disfluent automatic processing and an appraisal of coping potential as a disfluency reduction-based feeling of knowing (see Koriat, 1993), both appraisals are explainable based on processing fluency. Importantly, this understanding shows that an apparently "higher level aesthetic evaluation" such as aesthetic interest may be explained purely by the experiential information associated with stimulus processing (i.e., processing fluency).

Link between no disfluency reduction (No R) and confusion. Although the processes that establish confusion and interest have the same inception (i.e., a low-controlled fluency expectation), the subsequent perceiver-driven controlled processing proceeds substantially differently. That is, even though one had expected the interaction with the stimulus to be difficult, the fact that even the investment of effort did not make the interaction less difficult should lead to confusion (under certain circumstances, the interaction might be even more difficult than expected). Similarly, Silvia (2010, 2012) proposes that interest and confusion are closely related in that they share a two-dimensional appraisal space; they both involve appraisals of novelty and of comprehensibility (i.e., coping potential), but they differ in whether people's ability to understand is low (confusion) or high (interest). Using unusual visual art, he shows that interest and confusion can be distinguished by their within-person relationships with comprehensibility (Silvia, 2010). Note that in the case of confusion, we argue against the common understanding that fluency is only informative when it deviates from an expectation/context. That is, we argue that when people evaluate the effectiveness of their own processing efforts, fluency can be particularly informative because there is no variation or change in the fluency experience. However, the influence of fluency on judgment when there is no variation in fluency presumably requires that people pay attention to their experience (Unkelbach & Greifeneder, 2013a). Consequently, the frustration of failing to make progress in processing the stimulus (i.e., no fluency delta) although the perceiver was motivated to invest cognitive effort leads to the hedonically negative connotation of confusion, which is experienced as aversive.

Link between no disfluency reduction (No D) and boredom. Finally, we propose that, similar to confusion, the nonexistence of a fluency delta during controlled processing can be reflected in boredom. However, in contrast to confusion, the invariability occurs at a constantly high level of fluency (i.e., processing is consistently associated with ease). As described earlier, we argue that under these circumstances, a perceiver will consider the goal of successful understanding as accomplished, implying that the stimulus is abandoned (i.e., controlled processing is likely to terminate very quickly). Moreover, because the perceiver was motivated to learn something from the stimulus and hence to invest cognitive effort, he or she will (as was the case for confusion) be frustrated that there is no potential to satisfy this goal.

Therefore, boredom also contains a hedonically negative connotation and is experienced as aversive. In support of our arguments, Berlyne (1971) defines boredom as a hedonically negative, aversive state that results from a mismatch between an individual's need for stimulation/arousal and the availability of mental stimulation provided by a stimulus.

General Discussion

When people encounter an object, they can pass an aesthetic judgment spontaneously and quickly or they can process the object more extensively, including the processes of reflection and elaboration, before they evaluate it aesthetically. Importantly, aesthetic judgments are likely to be qualitatively different depending on which "processing approach" is used. In this article, we developed the PIA Model, a model that allows aesthetic preferences to be formed by both processing approaches, which, in our view, correspond with two hierarchical processing levels. Preferences based on the first, stimulus-driven processing level reflect aesthetic evaluations of pleasure or displeasure. When stimulus and/or perceiver motivational components are sufficiently pronounced, a subsequent processing at a higher processing level can emerge. This conditionally activated processing is characterized as perceiver driven and can give rise to aesthetic evaluations of interest, boredom, or confusion. Theoretically, our PIA Model integrates a dual-process perspective and ideas from lay epistemology into processing fluency theory and is able to explain the formation of aesthetic preference judgments following both processing levels based on one parsimonious mechanism (i.e., processing fluency). Beyond this integrative attempt, our model may contribute more than the sum of its parts insofar as phenomena that are unexplained, contradictory, or simply obscured by other models follow directly from our PIA Model. These include seemingly inconsistent preference patterns for easy versus difficult-to-process aesthetic stimuli, the inverted U-shape functions between mere exposure or stimulus complexity and liking, or the question of when people engage in aesthetic elaboration instead of using their gut feeling to form aesthetic judgments.

Our PIA Model can explain apparently contradictory findings regarding the relationship between processing fluency and aesthetic liking by ascribing the formation of aesthetic pleasure, aesthetic interest, aesthetic displeasure, aesthetic confusion, and aesthetic boredom to a single mechanism, processing fluency, and simultaneously allowing this mechanism to be effective at two hierarchical processing levels. Specifically, we suggest that because aesthetic liking is a very general expression of aesthetic preference, it may be triggered by both pleasure and interest. However, because pleasure and interest have different underlying processing mechanisms, pleasure-based liking may differ from interest-based liking in its relation to stimulus fluency. Thus, aesthetic liking related to fluent stimuli can be ascribed to aesthetic pleasure, whereas aesthetic liking associated with disfluent stimuli can be attributed to aesthetic interest (because of disfluency reduction). Similarly, we expect that displeasure, confusion, and boredom are all reflected in judgments of aesthetic disliking, which clearly elucidates the importance of considering the underlying process to understand and qualify judgments of aesthetic disliking.

In addition, our theoretical framework may help to understand the frequently reported inverted U-shaped relationship between mere exposure and liking (e.g., Landwehr et al., 2013). The increase in liking during initial exposure can be easily explained by the increase in fluency during automatic processing and the according increase in aesthetic pleasure. However, one likely side effect of externally imposed exposure (such as advertisements or stimuli shown in psychological experiments) is that perceivers want to justify their investment of perceptual capacity. Because improving one's own cognitive structures would provide a reasonable justification, this may lead to a continuous increase in the need for cognitive enrichment. Hence, over the course of additional exposures, controlled processing of the stimulus is increasingly triggered. However, if the stimulus does not offer any disfluency reduction potential, it will become boring during prolonged exposures. This experience of boredom may explain the downward trend in liking in the inverted U-shape.

Similarly, the U-shaped curve between complexity and liking (e.g., Berlyne, 1971; Munsinger & Kessen, 1964), which Reber, Schwarz, and Winkielman (2004) explain by incorporating attributional processes into fluency theory, can be captured by the PIA Model. According to the explanation by Reber, Schwarz, and Winkielman (2004), low levels of complexity make the source of fluency salient, thereby suppressing the attribution of fluency to aesthetic liking. As complexity increases, the salience of the source of fluency decreases, enhancing aesthetic liking. Further increases in complexity will eventually reduce processing fluency and thus will reduce aesthetic liking. The PIA Model offers a more parsimonious explanation when stimuli are processed in a controlled way. That is, for low to moderate levels of complexity, the increase in the stimulus processing affordance enhances the amount of disfluency reduction and thus enhances interest. If, however, the processing affordance associated with higher stimulus complexity exceeds the perceiver's capabilities, stimulus disfluency cannot be reduced, and confusion leads to a decrease in aesthetic liking. For stimuli that are only processed automatically, the PIA Model would predict a monotonic decrease in aesthetic liking with increasing amounts of complexity due to a decrease in fluency and pleasure, respectively. Thus, taking the two different processing levels proposed by the PIA Model into account may help to derive more precise predictions for the relationship between complexity and aesthetic liking and reconcile contradictory empirical findings.

Furthermore, our PIA Model contributes to an explanation of why and when people engage in elaborate and controlled processing of aesthetic stimuli (see Thesis 3).

Nevertheless, we believe that the motivational structure underlying aesthetic processing represents an inquiry for which much more research, particularly empirical research, is required. For instance, future studies could analyze the antecedents of the need for cognitive enrichment and whether they are related to an object's overt "aesthetic function." More precisely, because artwork is produced with the intent to evoke an aesthetic response (Shimamura, 2012), it directs a perceiver's attention to his or her aesthetic response (Palmer, Schloss, & Sammartino, 2013), implying that people may be more likely to have a need for cognitive enrichment when encountering artwork. Kruglanski and Webster (1996) suggest that the need for cognitive closure derives from an individual's cost–benefit analysis of the appropriate epistemic end state; the perceived costs and benefits are assumed to vary as a function of the situation as well as the person. Following this logic, one may argue that in situations or contexts where one has little existing knowledge about the stimulus category and fear of invalidity is salient (e.g., when the aesthetic judgment determines the purchase of an expensive and representative piece of furniture), the need for cognitive enrichment will be large.

Importantly, our PIA Model explains stimulus preferences that only refer to the aesthetic quality of a stimulus. As we stated at the outset, we understand aesthetic preferences as "disinterested" (Kant, 1790/1951), implying that we exclude the influence of content-based object information on aesthetic preferences. In overall stimulus preference judgments, however, fluency-based aesthetic appreciation competes with purely object-related or feature-based declarative information (Belke et al., 2010). Especially for stimuli with salient semantic content, an "aesthetic" preference judgment may therefore be obscured by content-based stimulus information, making the preference judgment not exclusively aesthetic. This may also explain occurrences of "fluent ugliness": If the stimulus has a particularly strong negative valence or connotation, people may not be able to make a purely aesthetic preference judgment, and the apparently aesthetic evaluation will be biased by the negative content of the stimulus.

We suggest that the PIA Model is eminently applicable to the perception of artwork. Specifically, higher order cognitive processes, such as finding meaning and understanding, that play an important role in the appreciation of art (Leder et al., 2004; Leder et al., 2006) reflect our understanding of perceiver-driven controlled processing that includes reflection and elaboration on an aesthetic object. Moreover, our model supports the notion that artists may actively use disfluency as an artistic means to disrupt people's thoughtless and shallow appreciation of a work (Bullot & Reber, 2013). Importantly, however, a psychohistorical approach to the science of art appreciation would suggest that a comprehensive appreciation of art requires the audience to rely not only on the visible traces of the artwork but also on the knowledge about the artist's intention and the context in which the artist worked (Reber, 2012).

Thus, to explain art appreciation by accounting for the appreciator's sensitivity to the art-historical context of a work (including its transmission over time), our PIA Model may incorporate tenets of a psychohistorical theory of art. In our reading, this would imply that during perceiver-driven controlled processing, appreciators engage in causal reasoning about the work of art and its context and function (Bullot & Reber, 2013). The ensuing sensitivity to and proficiency with the art-historical context enable the processing of art with regard to art-historical understanding, whereas the associated controlled processing fluency experience shapes the aesthetic evaluation according to our PIA Model. In addition, this type of processing may enable art appreciation based on artistic understanding. Consequently, an artwork's overall appreciation will be grounded not only in the fluency-based aesthetic evaluation but also in content-related artistic understanding. Assuming that experts are more likely to be proficient in art and its history than novices, this may also explain why responses to artwork vary as a function of expertise (Bullot & Reber, 2013). Irrespective of appreciators' art-historical sensitivity, our PIA Model suggests that the disparity between expert and nonexpert judgments—in which experts generally prefer works with visual elements of complexity and asymmetry (e.g., McWhinnie, 1968)—is a consequence of an elevated predisposition to engage in perceiver-driven controlled processing for experts.

In addition to contributing to the literature on aesthetics, we contribute to the general literature on the fluency of cognitive processes. First, we elaborate on a recent trend within the fluency paradigm, which acknowledges that the hedonic value of fluency is not an end in itself (Fiedler, 2013; Oppenheimer, 2008) but that fluency also has an impact on people's processing efforts (Alter et al., 2007; Oppenheimer & Alter, 2013). Moreover, we delineate a mechanism by which initial disfluent processing can eventually lead to fluency-based positive outcomes. In doing so, we extend the consideration period in which fluency experiences accompanying stimulus processing are typically analyzed, thereby advancing the idea that lower level and higher level fluency experiences may produce nonlinear and dynamic fluency effects on judgments.

Finally, our PIA Model allows us to deduce guidelines in terms of managing aesthetic responses to products. Thus, our model clearly has practical relevance for consumer behavior contexts in which many companies build their competitive advantage on the design of their products. In this regard, the PIA Model suggests that to optimize aesthetic product impressions, stimulus-based processing affordance and the likelihood with which a perceiver engages in elaboration on the stimulus need to be considered conjointly.

Acknowledgment

The authors thank Joachim Krueger and four anonymous PSPR (*Personality and Social Psychology Review*) reviewers for their thoughtful and constructive comments during the review process as well as Martin Natter and Daniel Wentzel for helpful comments on

an earlier draft of this article and Susanne Scholz for her help with a translation of the Fechner quote.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

Notes

1. Original version: "In der Tat können alle Vorstellungen, die zum geistigen Eindrucke beigetragen haben, auch unter Umständen wieder daraus hervortreten; es bedarf nur besonderer äußerer oder innerer Anlässe dazu. Das begründet die Möglichkeit, sich nach gewonnenem Totaleindruck eingehend nach verschiedenen, doch unter sich zusammenhängenden Richtungen mit dem Gegenstande zu beschäftigen, was einen zweiten Hauptteil der ästhetischen Wirkung der Gegenstände bildet, die ja nicht bloß in ihrem einheitlichen Totaleindrucke ruht. Dieser ist so zu sagen nur das Samenkorn, aus dem eine ähnliche Pflanze sich zu entfalten vermag, als die, aus der es entstand."
2. The present article focuses on the explanation of aesthetic evaluative judgments of visual stimuli. However, in principle, the framework may be extended to stimuli processed in different sensory systems, such as the auditory system.
3. To reconcile the preference for complexity with their fluency account, Reber, Schwarz, and Winkielman (2004) introduce the possibility of several additional assumptions and processes. They argue that if complex stimuli are preferred, they may hold "simplicity within complexity" (Reber, Schwarz, & Winkielman, 2004, p. 373) such that processing is expected to be difficult but turns out to be easy. In addition, processing facilitation based on a recompensation between perceptual and conceptual fluency or expertise in the respective stimulus domain may explain preferences for complex stimuli (Reber, Schwarz, & Winkielman, 2004).
4. Because of the underlying semantic structure, a coherent triad has been shown to be processed faster than randomly combined words (Topolinski & Strack, 2009).
5. Epistemic motivation is proposed to also have other antecedents, such as openness to experience (person based) or preference diversity (situation based). However, the need for cognitive closure is particularly relevant if an initial opinion or conclusion has been reached (De Dreu, Nijstad, & van Knippenberg, 2008). The fluency-based automatic feeling provides such an initial opinion.

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