

Aesthetics and Cognitive Science

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Abstract

Experiences of art involve exercise of ordinary cognitive and perceptual capacities *but* in unique ways. These two features of experiences of art imply the mutual importance of aesthetics and cognitive science. Cognitive science provides empirical and theoretical analysis of the relevant cognitive capacities. Aesthetics thus does well to incorporate cognitive scientific research. Aesthetics also offers philosophical analysis of the uniqueness of the experience of art. Thus, cognitive science does well to incorporate the explanations of aesthetics. This paper explores this general framework of *expansionism*: a research strategy that suggests that the explanatory goals and resources of both aesthetics and cognitive science should expand to include those of the other. Two relations are considered. First, what is the relation between aesthetics and more traditional cognitive science? Second, what is the relation between aesthetics and new developments in cognitive science that de-emphasize mental representation and emphasize body and action?

Be one an artist, viewer, or critic, experiences of art involve cognition. *Cognition*, like cognitive science, can be understood more or less narrowly. Most simply, cognition is just thought. Plausibly, this includes beliefs, knowledge, memory, attention, learning, reasoning and problem-solving, language use, and perhaps motivational states like desire and intention. A bit more controversially, cognition might include (some of) sense perception. What cognitive science says about cognition is important for philosophical aesthetics. The explanatory implications might also run the other way. One might infer from the fact that there is an independent field of research, aesthetics, and philosophy of art, that there is something special about the kinds of experiences – including cognitive ones – we have with artworks and aesthetic objects. Cognitive science has an obligation to accommodate these experiences (at least the cognitive ones) and does well to fulfill that obligation by attending to the philosophical work already done in this area.¹

Some philosophers have explored these directions of influence (Lopes 1999; Rollins 1999a; Carroll 2004; Levinson 2004). Importantly, some have been suspicious that any deep connection between aesthetics and cognitive science exists. Gregory Currie, while admitting that research in cognitive science is broadly important to art and aesthetics, suggests that such research has not and may never engage with more fine-grained issues regarding our experiences in making and consuming art. So while studies in cognitive neuroscience and psychology, for example, may help to clarify the perceptual and cognitive capacities involved in seeing a picture or imagining a fictional world, ‘they are relatively indiscriminating; they do little to illuminate our aesthetic judgements about particular works, traditions, styles, or genres’ (Currie 2003: 708). It seems that the forecast here is that in explaining experiences with art, cognitive science will not displace philosophical aesthetics.

Few discussions of the intersection of aesthetics and cognitive science clarify the notion of cognitive science at work. A commonly assumed understanding among philosophers

and cognitive scientists alike is that cognitive science is simply the science of cognition. This assumption is at least partly justified by today's convention: there seems to be little constraint on the research activities of many cognitive science centers and academic departments short of their studying and theorizing cognition in broadly scientific ways. According to this notion of cognitive science – Robert Harnish calls this the *broad construal* (Harnish 2002: 2) – it is a discipline centered around investigating the domain of cognition, and by a variety of methodologies: including anthropology, cognitive neuroscience, cognitive psychology, computer science, linguistics, and philosophy. However, the discipline is sometimes understood more narrowly. According to the 1978 Sloan Report on Cognitive Science, the subdisciplines of cognitive science share 'a common research objective: to discover the representational and computational capacities of the mind and their structural and functional representation in the brain' (1978: 76).² This is a *narrow construal* of cognitive science; it is thus not merely a discipline but a doctrine, committed to the claim that the mind is a type of computer (Harnish 2002: 4). This doctrine is broadly known as the *computational theory of mind*. According to Ned Block (1983: 521), cognitive science would not be a cohesive field of research if not for this commitment.³

Today, the broad construal has common usage on its side. The narrow construal has history on its side. For purposes of this discussion, a choice between these two construals is not necessary. For that matter, such a choice may be arbitrary: it just may be the case, at least if current research practices provide relevant data that cognitive science is not a precisely circumscribed domain. Thus, for analysis of the relation/s between aesthetics and cognitive science, only a few minimal assumptions are made.

Actual practice dictates this: cognitive science involves empirically grounded research on cognition. It is a science by virtue of some but not all of its methods (e.g., cognitive science includes both cognitive neuroscientific and philosophical methods). Conceptually, things are murkier. Cognitive science as such tends to study features of cognition – beliefs, knowledge, learning, attention, etc. – as involving mental representations over which certain computations are performed. So a *default research assumption* might be that one should think of cognitive states as representational states and cognitive processes as computational processes. This assumption, however, is ambiguous and overly controversial. It is ambiguous between the following two possibilities. The default assumption may have it that the *explananda* for cognitive science are all and only computational processes of the mind, and this for the reason that cognition is just computation. The default assumption may, alternatively, be one about method rather than metaphysics: the *explanans* for cognitive science are computational and representational concepts, such that cognition is best (or at least well) explained and modeled in computational terms. The weaker assumption can be made without committing to the identification of the mind and computer.

Convention makes exceptions of both senses of the default research assumption: one can find working cognitive scientists who do not commit to a computational theory of mind and those who use methods other than computational modeling techniques. Perhaps the way forward, at least for this discussion, is to follow recent convention but with an eye towards a conceptual understanding of cognitive science. Cognitive scientific research is just what researchers in cognitive science departments are studying. Such research tends to favor representation and computation as *either* the *explananda* or as *explanans*. So a cognitive scientist might, as such, assume that the target for her explanation is mental representation and computation; or she might only assume that representational and computational models are useful ways of explaining cognition. But as is

discussed next, the centrality of computation and representation to cognitive science is being challenged, and indeed by researchers working from *within* cognitive science.

In what follows, two relations between aesthetics and cognitive science are considered. First, what is the relation between aesthetics and more traditional cognitive science? Second, what is the relation between aesthetics and new developments in cognitive science involving research on embodiment, artificial life, and robotics? The first comparison targets cognitive science as emphasizing – although not exclusively – representation and computation. The second comparison considers recent cognitive scientific research that de-emphasizes – although not necessarily to the point of exclusion – representations.⁴

§1. *Intentionality and Expansionism*

Currie's general cautionary note that the philosophical questions of aesthetics are not displaceable by cognitive science is apt, but his forecast may be unnecessarily limiting. A purely scientific explanation of experiences of art, while illuminating, undoubtedly fails to answer philosophical questions about meaning, interpretation, and aesthetic experience. However, Currie's suggestion that cognitive scientific research is relatively indiscriminating with respect to 'aesthetic judgements about particular works, traditions, styles, or genres' is misplaced. Like the scientific accounts in question, philosophical aesthetics rarely concerns itself with analysis of such particularities. So while the philosopher of art may concern herself with the influence of categories of art on aesthetic experience, or with appreciative and critical differences across art media or genre, among many other things, she rarely narrows her focus to the degree that Currie intimates. Rather, such a narrowed subject matter is in the hands of critical theorists and art historians. So cognitive science and aesthetics may be on a par with respect to generality of *analysanda*. Currie indicates that cognitive scientists might fruitfully ask questions like '“how do we recognize the contents of pictures at all?”' and “what kinds of mental operations are recruited by imagination?”' (Currie 2003: 708). Philosophers of art surely concern themselves with these and other like questions, questions fundamental to experiences of art. As the work surveyed next suggests, it is questions at this level of generality where aesthetics and cognitive science may fruitfully meet.

A philosophical problem fundamental to cognitive science is the *problem of intentionality*. First articulated in its modern form by Franz Brentano (1874), the problem is simply this: how do mental representations manage to stand for or represent the things that they do? How does my thought about apple pie or my grandmother manage to be *about* those things? Generally, how does any representation, be it a picture, a sentence, or a mental state, manage to represent its *representatum*? This generalization might motivate the inference that the problem of intentionality of the mind just is the problem of representation. In this spirit, Arthur Danto (1999: 30; see also Rollins 2004: 176) asks 'if a bit of mere paint can be *of* the Passion of the Lord, why on earth cannot a state of the brain?'. The rhetoric suggests that if one thinks the first problem is tractable, why should one be troubled by Brentano's problem of intentionality or, for the physicalist, by the possibility of brain states exhibiting intentionality?

While there is something to this suggestion, for it to have full force the direction of explanatory dependence would need to run from general (nonmental) representations to mental representations. However, many have argued for the opposite order of explanation. A picture (or sentence, or sculpture, or utterance) is about things – has intentionality – in a merely derivative way. A painting has its content or meaning conferred by its maker and/or audience. Without this conferral a painting is, if not a mere, at least a

meaningless dab of paint. Mental states, in contrast, have their intentionality in a non-derivative way; they possess meaning, one might say, naturally. Things like paintings and sentences possess *derived intentionality*; and they derive that intentionality from mental states, only the latter of which possess *original intentionality* (Haugeland 1981; Searle 1983; Fodor 1987). Put another way, representational systems involving pictures or words are at least partly *conventional*, while organisms with minds involve representational systems that are purely *natural* (Dretske 1981, 1988, 1995).⁵ Granting this distinction, the important connection between representation in mind and representation in art, intimated by Danto's comment, is simply that an explanation of the first is fundamental to an explanation of the second. This would imply a fundamental connection between aesthetics and cognitive science: a complete account of derived intentionality depends on an account of original intentionality. The distinction between derived intentionality and original intentionality is not, however, without its critics (Dennett 1987). At the very least, consideration of the purported distinction suggests that Danto's comment, if interpreted strongly, is implausible: whether one depends upon the other, the differences between nonmental representation and mental representation suffice to prevent explaining the second by *just* explaining the first.

In an introduction to a special issue of *Philosophical Psychology* devoted to cognitive science and aesthetics, Mark Rollins (1999a) identifies this same connection. A concern common to many of the papers included in that issue, Rollins suggests, is 'the nature of *mental representation* in the understanding and perception of art, and the need to include it in explanations of aesthetic experience' (1999a: 382). Erik Myin (2000: 43) suggests that the concept of representation is one of two (the other being '*pathways* or *modules*') that 'ground the hope for a deep connection between the representational science of vision and the art of visually representing'.⁶ Indeed, as Dominic Lopes (2003: 632) suggests, this deep connection between aesthetics and cognitive science may be traced back to Nelson Goodman's famous work on representation. '[B]y encouraging us to think of the arts, at least in part, as distinct representational systems, Goodman paved the way for a rigorous philosophical examination of artworks as the products of the representational mind'.

Lopes argues for a research strategy he calls 'expansionism'. Expansionism is captured by the following two theses. First, the creation and consumption of art involves the exercise of the same cognitive capacities used to negotiate the environment and engage with conspecifics. Call this the *common capacity thesis*. Second, expansionism suggests that these capacities are extended in novel, art-specific ways when engaging with artworks (Lopes 2003: 645–6). Call this the *uniqueness thesis*. Explanatory implications follow from each thesis. The common capacity thesis implies the importance of cognitive science to aesthetics, as the job of cognitive science is partly to explain those common capacities. Although the thesis may not be terribly surprising, it is important: it encourages cognitive scientific explanations in the context of the arts. The uniqueness thesis implies a special importance for aesthetics to cognitive science, namely, that cognitive science accommodates the art-specific operation of cognition. Thus, expansionism offers a framework for analysis of mutual explanatory goals of aesthetics and cognitive science.

§2. Aesthetics and Mental Representation

2.1. THE UNIQUENESS THESIS

The truth of expansionism as such depends centrally upon the truth of the uniqueness thesis. The uniqueness thesis is the more controversial of the two. Considering it first,

then, in what ways might the experience of artworks expand ordinary cognition? Following Lopes expansionism may be applied by noting the following feature of depiction. It is in the understanding of non-naturalistic pictures – which incidentally are just the kind most neglected by theories of depiction – that uniquely pictorial types of cognition and perception are most salient at work. Methods of depiction have been developed, with increasing sophistication, to exploit our recognitional capacities, and in ways that outstrip the recognitional capacities employed in the experience of ordinary, nonartistic stimuli. By and large, appreciators of pictures are up to the task: they develop, employ, and hone the skills required for understanding pictures in all their variety. The theoretical implication is that the unique interpretive skills employed to understand pictures, although not at work in recognition and understanding of ordinary, natural stimuli, should nonetheless be included in the *explananda* of the cognitive science of vision (Lopes 2003: 645–6, 650).

Rollins also argues for a kind of pictorial expansionism.

[O]ur responses to visual artworks can be especially revealing of the fundamental principles of perception or cognition, in terms of which the responses are supposed to be explained. Paintings and drawings are not just one class of stimuli that must be accounted for. They are particularly important cases that may tell us more about our perceptual abilities than ordinary objects usually can (2004: 175).

Rollins situates his analysis in the context of the debate between actual and hypothetical intentionalists. The *actual intentionalist* claims that interpretation of the meaning of artworks should be guided by the actual intentions of the creator of those artworks. This is analogous to how one might interpret uttered sentences in an ordinary conversation; one tries to determine what a person ‘really means’. The *hypothetical intentionalist*, conversely, claims that artworks should be interpreted in accordance with what intentions the audience would justifiably take the creator to have, given the properties of the work in question. This is analogous to what one could reasonably infer a speaker to mean, given a context of utterance and linguistic conventions, independent of what the speaker as a matter of fact ‘really means’.⁷ Actual and hypothetical intentions are normally understood in terms of socio-historical practices of interpretation. Following both Danto (1993) and Jerry Fodor (1993), Rollins notes that these practices supervene on cognitive states and processes. One approach to the question of interpretation from the perspective of cognitive science is to focus on the subvenient cognitive states and processes. Rollins concludes that this approach reveals the following special feature of pictures (or, more generally, artworks) as objects of interpretation. The minimal communicative intentions of artists embodied in representational states at the neural level, *microintentions*, provide an interpretive guide through the artwork for the viewer of that work.⁸ This interpretive guide also operates at the neural level.

On my account, the artist’s minimal intentions define an attributive process, which constrains possible meanings, not as reference constrains meaning, but by controlling the flow of information and the strategies the interpreter can employ (Rollins 2004: 186).

The perceptual strategies that one employs in interpreting a picture are constrained by the strategies that are manifested in the work. Artworks are thus cognitively and perceptually special: they betray the minimal communicative intentions needed for their proper appreciation.⁹

Contrary to the perception-based approaches taken by Lopes, Rollins, and the majority of philosophers on the subject, John Kulvicki addresses questions about pictorial represen-

tation by considering the representational systems in which pictures function. Extending the work of Nelson Goodman, Kulvicki identifies four structural conditions for a pictorial representational system: relative repleteness, relative syntactic density, semantic richness, and transparency. Any system that satisfies these conditions is pictorial.¹⁰ Kulvicki infers from these structural facts about pictorial representational systems, rather than facts about how pictures are perceived, that pictures are a unique perceptual kind. This suggests an important theoretical contribution.

A popular view in cognitive neuroscience and philosophy of psychology has been that visual, auditory, and somatosensory systems make use of imagistic representations. Without an account of what makes a representation an image, such claims cannot be straightforwardly evaluated (Kulvicki 2003: 324; see also Kulvicki 2006).

Kulvicki delivers just such an account of images, and one grounded in the representational structure of pictures.

Philosophers are not alone in flagging these interpretive and representational features of pictures and, more generally, artworks. Indeed, a number of scientists have argued for the same general uniqueness (or at least unusualness). Thus, cognitive neuroscientists Margaret Livingstone (2002), V.S. Ramachandran and William Hirstein (1999), and Semir Zeki (1999) on, predominantly, visual art; linguist Ray Jackendoff and musicologist Fred Lerdahl (Lerdahl and Jackendoff 1983; Lerdahl 2001; Jackendoff and Lerdahl 2006), cognitive neuropsychologists Isabelle Peretz and Max Coltheart (Peretz and Coltheart 2003; Peretz 2006), and Bharucha et al. (2006) on music, among others. These analyses imply both that philosophical aesthetics should be aware of the relevant cognitive and neurological facts that underpin unique artistic schemes, and that cognitive science is obligated to explain this special category of perceptual object.

One may remain sceptical of the uniqueness thesis. Depending upon the level of description, one might maintain that the purportedly unique representational and semantic features of artworks can be accommodated by the standard explanations of cognitive science. Perhaps this is so. At the very least this thesis of expansionism motivates a progressive research strategy, whereby cognitive science may accrue theoretical benefit through the explanation of artistic phenomena.

2.2. THE COMMON CAPACITY THESIS

The common capacity thesis of expansionism is less controversial but not trivial. Some cognitive and perceptual capacities are crucially important to our experiences of art. Mental representation is one obvious general candidate. As just discussed, general perceptual capacities are clearly central as well. Philosophical aesthetics does well to incorporate the relevant cognitive scientific research. Another important issue in aesthetics, implied by some of the previous discussion, call it the question of the *innocent eye*, invokes research on perception and its relation to cognition.¹¹

The art critic John Ruskin, and many of his contemporaries of the mid- and late-19th century, argued that the artist's aim and the audience's goal in proper appreciation of art is an *innocent eye*, a 'return to the unadulterated truth of natural optics'.¹² In more familiar contemporary terms, an innocent eye thesis suggests that our experiences of (visual) art either are/or should be *un*influenced by cognitive elements like beliefs, knowledge, and concepts. Ernst Gombrich (1961) was the first to forcefully reject the innocent eye as a myth. Gombrich's rejection was informed by the New Look psychology of his day, which analyzed perceptual experience as being influenced by

higher cognitive states and processes, namely, knowledge and concepts.¹³ According to Gombrich, perceptual experiences of pictures depend importantly upon the conceptual repertoire of the perceiver. Dispelling the innocent eye as myth was a motivation common to Gombrich's constructivism and Goodman's conventionalism. According to Goodman's (1976) view, all artworks are composed of symbols, and these symbols are to be understood in terms of their reference and the symbol system of which they are a part. For Goodman, then, artworks are conventional and their experience is highly cognitive. The relevant problem today does not consist in vindicating any such extreme: between them, there are few wholesale endorsements of Gombrich's constructivism, Goodman's conventionalism, or the innocent eye. Rather, the problem concerns the degree to which the eye is innocent. The question in cognitive science and philosophy of mind is, to what degree, if at all, is perceptual experience cognitively influenced?

If the innocent eye is indeed a myth, then perceptual experiences of art are, in some way, dependent upon the concepts or cognitive states of the perceiver. If experiences of artworks are cognitively influenced then it is plausible that experiences of nonartistic stimuli are similarly influenced.

[P]ictures do not transform human perception ... but rather merely activate the perceptual capacities we already possess. The human perceptual apparatus—at the level of seeing how things look and recognizing them on that basis—does not change, and, therefore, art does not change vision, at least in the sense of restructuring the human capacity for recognizing things perceptually ... (Carroll 2001: 11).¹⁴

The common underlying capacity is perception *plus* whatever cognitive capacity influences perception. There are two distinct candidates. Experiences of art, and of other objects and events, may be influenced by concepts. Alternatively, experience may be influenced by cognitive states like belief. Call the first possibility *conceptual influence* and the second *doxastic influence*. Cognitive science addresses both possibilities.

Philosophers and cognitive scientists debate whether perception is conceptual or non-conceptual.¹⁵ The question can be posed in a number of ways. Most simply, does being in a perceptual state require grasp of the concepts that characterize the content of that state? Does having a perceptual experience as of a red tomato require grasping or applying the concepts REDNESS and ROUNDNESS and, perhaps even, TOMATO. Conceptualists answer 'yes' to this type of question, nonconceptualists, 'no'. Alternatively, the question may be posed in terms of what Richard Heck Jr. (2000: 487) calls *conceptual articulation*. Is perceptual content, like the content of propositional attitudes like belief, structured by concepts?¹⁶ When one tokens a belief that 'Grass is green', one is in a state the content of which is articulated by certain concepts – GRASS and GREENNESS – plus a relation between them. Some think that perceptual content is structured in a similar way. Nonconceptualism denies this thesis: perceptual content is not conceptual in this sense.¹⁷ The question of conceptual content forces a traditional epistemological problem. Intuitively, perceptual experience provides reason for belief. But for this to be the case, the content of perceptual experience has to be graspable or structured in a way appropriate to enter into inferential relations with belief. Thus the nature of perceptual content, and whether it is conceptually influenced, is of foundational epistemological importance (see Sellars 1956; McDowell 1994).¹⁸

Cognitive science also addresses the possibility of doxastic influence. The question here is whether perceptual experience may be influenced by cognitive states like belief. While perceptual experiences clearly influence belief formation, some maintain that, conversely, beliefs (as well as other cognitive states like desire or memory) do not

influence perceptual experience. Perceptual processing, at least in its early stages is, *cognitively impenetrable*, ‘prohibited from accessing relevant expectation, knowledge, and utilities’ (Pylyshyn 1999: 341). The cognitive impenetrability thesis may be motivated by a modular theory of mind, which advances a mental architecture characterized by functionally discrete, informationally encapsulated structures (Fodor 1983; Sperber 2002; Carruthers 2006) or it may be motivated by neuroscientific research on perceptual systems (Raftopoulos 2001). Cognitive impenetrability is not without its dissenters. Paul Churchland (1979, 1988) has been a persistent critic of both modularity and cognitive impenetrability. Novel arguments for theory-laden perception have been offered (Brewer and Lambert 2001; Estany 2001; McCauley and Henrich 2006). The importance of this debate to cognitive science should be clear: models of perceptual representation must be constrained by the facts about cognitive penetrability.

Either conceptual influence or doxastic influence would vindicate Gombrich’s claim that the innocent eye is a myth. The ways and degrees to which perceptual experience is cognitively influenced, if it is in fact so influenced, is important for theories of the experience of art. So while the innocent eye strictly understood may today be something of a strawman, questions about interesting cognitive influences on perceptual experience, and thus experience of art, remain open. This common capacity – perceptual experience and the degree to which it is cognitively influenced – has been recognized in recent work at the intersection of aesthetics and cognitive science.

Daniel Gilman argues that the eye may be more innocent than many theorists of pictorial representation assume, at least if the relevant influence is doxastic. Neuroscientific and computational studies on vision suggest that vision is not influenced by the cultural and historical beliefs and knowledge that conventionalism requires. Gilman categorizes the theories of Gombrich, Goodman, Max Black, and Kendall Walton as broadly conventionalist, despite their various differences, insofar as they each require that a viewer have the knowledge and/or habits relevant for recognition of the conventional (symbolic) relations between representation and represented. Gilman takes depiction of perspective as his central example.

[I]n many cases the visual problems posed by a perspectival pictorial stimulus are solved by fast, automatic processing mechanisms in early vision—mechanisms that typically do not have access to the sorts of culture-specific information the conventionalists think necessary to even the simplest perception (Gilman 1992: 185).

Perception of pictorial perspective may be sufficiently explained by the same mechanisms as ordinary perception of perspective. The latter is not conventional: it may be explained by the physiological and computational features of early vision. Therefore, Gillman suggests, neither is the former conventional.

If true, this is bad news for the conventionalist, but only when the innocence of the eye is interpreted as a claim about doxastic influence. So, the conventionalist of whatever variety and strength may get the cultural influence needed for her conventionalism by way of conceptual influence. This is the more plausible avenue and indeed is the one explored by some theorists of pictorial representation.

Some philosophical positions on pictorial representation commit to conceptual influence; others deny it. Robert Hopkins (1998; see also 2003), for example, explains pictorial representation in terms of experienced resemblance in *outline shape*. This experience is partly conceptual: it is contingent upon the perceiver’s conceptual grasp of the relevant depictum, importantly, its appearance vis-à-vis outline shape. Lopes rejects the need for conceptual influence for pictorial experience. He accepts that some pictures invite

twofold experience: we experience features of the picture's design and the scene depicted simultaneously. You see both the swirling brushstrokes and the starry night in Van Gogh's *Starry Night*. But neither experience of a picture's *design content* nor its *pictorial content*, Lopes argues, require conceptual grasp. According to this recognition-based account, experience of pictures, like experience generally, depend on the operation of subpersonal perceptual processes, evidenced by differential responses to novel stimuli. Lopes argues that drawing, as a recognition-based skill, is also nonconceptual in the relevant sense. Contrary to Gombrich's claim that artistic accomplishment depends on the artist's concepts or 'mental set', Lopes (1996: 184–7) suggests that translations from a three-dimensional scene to a two-dimensional plane are guided by subpersonal mechanisms of recognition. No conceptual grasp is necessary for this basic feature of drawing.

John Dilworth suggests a *double content* view that accommodates (some of) the intuitions of both conceptualist and nonconceptualist theorists, as well as twofold experience of pictures. Dilworth appeals to research in cognitive science that suggests that perceptual processing is generally hierarchically organized. In early stages of perceptual processing, information is encoded (mostly) nonconceptually, sensitive to aspectual features of the perceived stimuli. At later stages in processing, the information encoded at the lower levels is interpreted in a way sensitive to the concepts. Thus, according to this model, perceptual experience results from perceptual processing that involves both nonconceptual and conceptual content. For Dilworth, the first corresponds to *aspectual* content; and the second, *subject matter* content, is decoded from the first. Aspectual content includes stylistic and medium-related features of representations. Subject matter content corresponds to what is represented. Twofoldness might be explained by simultaneous experience of the two kinds of content (Dilworth 2005a; see also 2005b, 2005c).

The explanatory success of the double content view depends on the general account of perception and content from which it derives. Dilworth is right to appeal to the increasing popularity of nonconceptual content views. However, the proposed nonconceptual/conceptual division of labor, as it were, remains contentious. Some theorists have argued instead that perceptual processing involves active categorization all the way down, resisting any distinction between sensation and perception or raw sensory information and the later conceptualization thereof (see Matthen 2005). In any case, the double content view provides a clear example of the common capacity thesis: it supposes that the facts about experience of pictures are best explained by the facts about the underlying capacity, namely, perceptual processing. Despite their differences, this is true of the views of Hopkins and Lopes as well. In fact, all three philosophers maintain that perceptual experience of pictures depends (at least partly) upon the operation of ordinary perceptual capacities. The relevant disagreement concerns the degree and ways in which this operation is conceptually influenced. Endorsement of expansionism implies that adjudication will, partly, come from cognitive science.

Although vision and pictorial still dominate the respective literature on perception and perception of art, similar issues arise for and have been analyzed in the philosophy and cognitive science of music. In her important work on the metaphysics and perception of music, Diana Raffman (1993) explains the apparent ineffability of musical experience by appeal to a modularized theory of perception. One of her theses is that language fails to describe the *nuances* of music and its experience – nuances are fine-grained, performative details not dictated by a score, and often just noticeable – because, more fundamentally, such nuances are categorized by mental schema that are more coarsely grained. Experience of musical nuance is thus ineffable *because* nonconceptual. Raffman's analysis draws importantly on Fodor's modular theory of mind and Evans' fine-grainedness argument

for nonconceptual content (Evans 1982; Fodor 1983).¹⁹ More recently, Michael Luntley (2003: 417) has argued for nonconceptual content in perception of music (explicitly) not by appeal to fine-grainedness arguments but instead by appeal to the relation between experience and rationality. According to Luntley, one may experience a dominant seventh chord, for example, insofar as one discriminates the auditory event. If one is a novice – lacking both music-theoretic knowledge and performance competency – one may represent this event without the representation being subject to inference. Nonconceptual contents as experienced in music by novices are nonconceptual *because* they do not ‘figure in rational organization of behaviour’. Luntley suggests that this metric for conceptual content generalizes, and if so it provides the nonconceptualist with a strategy that is sensitive to the Sellarsian challenge to perceptual knowledge.

Mark DeBellis (1995: 57) also reserves conceptually contentful experience of music for those competent in music-theoretic concepts. In contrast, the novice may have *weakly nonconceptual* experience – experience that involves grasp of concepts, although not music-theoretic ones – or *strongly nonconceptual* experience – experience ‘that is not the exercise of any concept’. DeBellis’ account is controversial in opposing ways. His strongly nonconceptual content requires that nonconceptual content, as it figures in the perception literature, is (psychologically) possible. Conversely, the proposed experience of the musical expert requires that perception is cognitively penetrable, and by music-theoretic concepts and knowledge. According to both DeBellis and Luntley’s views, whether the ear is innocent depends on whether it has been trained. This brings us to a kind of full circle: Gombrich’s foils (Ruskin et al.) also argued for the perceptual effects of artistic training. The difference is this: Ruskin and his contemporaries argued that artistic training *restores* perceptual innocence. The theorists considered here, and many of their contemporaries, argue that artistic training *removes* innocence.²⁰

§3. Aesthetics, Embodiment, and Action

Much recent work in philosophy of mind and cognitive science has emphasized the role of the body and action in perception and cognition. This is not exactly new. The philosopher Hubert Dreyfus has been arguing for the importance of embodiment for better than three decades. According to Dreyfus (1972, 1992), bodily experience of the everyday world enables gestalt pattern recognition and ‘coping’ capacities. Holistic ‘lived experience’ is thus a necessary condition for human understanding and higher-order cognition. Dreyfus’ work owes much to a number of earlier thinkers, most especially continental phenomenology: Husserl (1912); Heidegger (1927); and Merleau-Ponty (1942, 1945). Gibson’s (1979) ecological approach understands perception as geared to *affordances* of the environment – objects or features of the environment that are apt for use and action, in ways relative to different organisms. Similarly, *Dynamic Systems Theory* emphasizes the interactivity between complex systems and their environments over time (Varela et al. 1991; Thelen and Smith 1994; Beer 1995; van Gelder 1995).

These views have often been launched as criticisms of the representationalism and rule-bound computation of classical cognitive science – sometimes from the inside, sometimes from the outside – motivating increased scepticism about the explanatory purchase of cognitive science as such. Indeed, many researchers working in related disciplines like evolutionary robotics embrace these negative implications for cognitive science. However, the research strategies fundamental to this scepticism are also appropriated to supplement rather than supplant more traditional, representation-based cognitive science. In this spirit, many philosophers and cognitive scientists do not dismiss mental representations,

but instead the traditional assumption that mental representations are tokened and computed in a way *decoupled* from the body and action. For example, Andy Clark (1997: 143–75) argues for a view that accommodates the sceptic's insights regarding the explanatory importance of dynamics of body and environment, while maintaining that there is space for both *being there* and representation in cognitive science. The unifying thread is this: both sceptics and combined theorists take the study of embodiment to be important not *just* for the explanation of action but also for the explanation of cognition. The disagreement concerns whether embodiment is sufficient for cognitive explanation.²¹

With this alternative development in cognitive science come alternative approaches to aesthetic issues. If at least the common capacity thesis of expansionism is true, then some old questions in aesthetics may be seen in new light. Rollins (1999b, 2003, 2004) argues for a new category of perceptual approach to pictorial representation that he calls *Strategic Design Theory* (SDT). This category divides into *internalist* and *externalist* theories. An internalist SDT suggests that solutions to perceptual problems like contour completion are achieved not by exhaustive representations of the environmental stimuli, but by exploiting diagnostic features of the stimuli – features of the environment likely to be informative. This enables more efficient use of attention and ultimately more efficient computation of input.²² An externalist SDT emphasizes the relation between perception and action. Perceptual processing is task-dependent: internal representations are constructed and employed by the system only as needed for the development and execution of motor plans. Some of the computational load is thus borne by the environment.²³ Common to the internalist and externalist strategies is a de-emphasis on internal representations and an emphasis on environment and/or action. Rollins claims that either type of SDT offers a (partial) account of the comprehension and interpretation of artworks. Whether internal or external, both artist and audience employ perceptual strategies in the experience of a work. Artists guide audiences by creating a work that constrains what perceptual strategies enable understanding of that work. The philosophical advantage of such a naturalistic account is that it affords an explanatory role for artistic intention in the experience of art without, on the side of the audience, overintellectualizing the process of meaning attribution and, on the side of the artist, without overintellectualizing intention or giving it an exhaustive role in the determination of meaning (Rollins 2004: 185–6).

In a related spirit, a number of recent theories of perception might be broadly categorized as *active*. In slogan form, active theories of perception say that perceiving does not happen to us, it is something we do (Noë 2004). Perceptual experience is not just the result of internal representations formed in response to external stimuli, but also of the fact that we plan and execute action in the world, and in ways dependent upon the physiological details of our body and brain (Hurley 1998, 2001; O'Regan and Noë 2001). This general research strategy is informed by much of the same research as Rollins' strategic design theory: by phenomenology, recent work in robotics and computational theory, and the neurosciences. Indeed, active theories of perception have been invoked to develop explanations of artistic perception that de-emphasize internal representations and emphasize bodily action (Ione 2000; Myin 2000; Lopes 2004; Seeley and Kozbalt 2008).

Some recent theorists of perception distinguish the capacity of visual perception to provide descriptive information about stimuli from its capacity to guide action (Clark 2001, 2007; Campbell 2002; Matthen 2005; Carruthers 2006). These theories are influenced by the work of cognitive neuroscientists David Milner and Melvyn Goodale (1995), who distinguish two information-processing streams in the brain. The *ventral stream* processes information relevant to recognizing and categorizing the objects of

perception. The *dorsal stream*, in contrast, processes information relevant to fast, online control of motor action. Mohan Matthen (2005: 293–319) distinguishes two corresponding visual systems. *Descriptive vision* (*dv*) provides experience of the visual properties of distal objects. *Motion-guiding vision* (*mgv*) locates objects in agent-centered terms for orientation and action. This distinction suggests novel analyses of experience of artworks. According to Matthen, information is computed by *mgv* only when visual stimuli are actual, three-dimensional objects. As *mgv* provides agent-centered coordinates for perceived objects, seeing involves a *feeling of presence* when and only when *mgv* is engaged.²⁴ This implies an experiential difference between seeing a depiction and seeing a thing depicted – the *depictum* – *through* the depiction: seeing the *depictum* lacks a feeling of presence, as features of the two-dimensional *depictum* are processed only by *dv*. This generalizes to differences between experiences of two-dimensional versus three-dimensional art media. Sculpture, theatre, and performance, in contrast with painting, photography, and film, will engage both *dv* and *mgv*, resulting in agent-centered experiences of the former but not the latter. This experiential difference might be fruitfully explored in comparative analyses of the aesthetic and affective features of two- versus three-dimensional art media.

§4. CONCLUSION: A POSSIBLE EXPERIMENTAL TURN

Aesthetic theories may take an increasingly more experimental turn. Mike Wheeler (1996), among others, has suggested that the techniques of artificial life and evolutionary robotics may experimentally support theories of aesthetic, and closely related, phenomena. An example of such an approach has been taken to creativity – a phenomenon by no means exclusive, but certainly relevant, to philosophical aesthetics. Rather than beginning with high-level genius or masterworks, one might take a bottom-up approach to the phenomenon by using evolutionary robotics (ER). ER is a biologically inspired research methodology where artificial agents are assessed for fitness by a genetic algorithm, according to fitness functions specified for some kind of task completion. Fit agents are selected for reproduction and, after many generations, agents evolve to perform the desired task/s (Husbands et al. 1997; Nolfi and Floreana 2000). Jon Bird and Dustin Stokes (2006, 2007) suggest some minimal conditions for creative behavior and then attempt to artificially evolve agents that meet those conditions. Notions of *agency*, *autonomy*, and *novelty* are analyzed both through the lens of conceptual analysis and the lens of robotics experimentation. This approach yields empirically supported answers to traditional questions regarding creativity. For example, Kantian and romantic theories of creativity specify a negative condition on creative thought such that a person (or system) may act creatively only if that person is free from constraints. Stokes and Bird (2008) show that this supposition is false: systems subject to considerable behavioral constraints may still act in ways that are, at least minimally, creative.

Some argue not just for experimentation in aesthetics, but that art and its experience are *experimental* (Zeki 1999; Livingstone 2002; see also Rollins 2004). Alva Noë (2001, 2002) suggests that some artworks are what he calls *experimental*: they offer viewer opportunities to experiment with and reflect upon the phenomenological nature of one's own perceptual experience. The study of such artworks provides 'a model of how to study experience' (Noë 2001: 128). Noë's experimentalist claim is premised on his *enactive* theory of perception, which takes experience to result from the active exploration of environment. Experience is a kind of activity that consists in the exercise of the perceiver's implicit knowledge of *sensorimotor contingencies*: interdependent relations between move-

ment and sensory stimulation.²⁵ Some artworks thus provide opportunity for perceivers to ‘catch themselves in the act’ of exploration of the environment. One worry is that the purported feature of the so-called experimental art generalizes not just to all art objects, but to any object of experience. Noë’s response is to claim that certain types of artwork – Noë chooses the large-scale installations of Richard Serra as an example – are ‘intrinsically site-specific’ particulars that overwhelm the senses in a way especially suited to self-reflection upon experience. Whether or not Noë’s defense is satisfying, his insight is an important one. Experiences of art, most especially when explained by active theories of perception, may offer an alternative experimental test bed for claims about consciousness, experience, and phenomenology.

Artistic experience as experiment is expansionism at its most extreme: it says that the exercise of common capacities in experiences of art is sufficiently unique to provide experimental insight into both artistic *and* nonartistic exercises of those capacities. This instance of expansionism, and all others considered before, is founded on two basic observations. One, there are contingent environmental, physiological, and psychological facts about cognition and experience. Two, there is something cognitively and perceptually special about the experiences of art. The conjunction of the two observations implies the mutual theoretical importance of aesthetics and cognitive science. Purely scientific accounts of cognition neglect cultural facts that figure importantly in the cognitive environment. Purely philosophical accounts of aesthetic experience neglect the contingencies of cognition and perception. This, finally, is the basic moral of expansionism: the explanatory goals and resources of both aesthetics and cognitive science should expand to include those of the other.

Short Biography

Dustin Stokes works on philosophical issues at the intersection of philosophy of mind/cognitive science and aesthetics. His research interests include creative thought, imagination, and perception. He is currently a postdoctoral fellow at the University of Toronto, and formerly at the Centre for Research in Cognitive Science at the University of Sussex.

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Notes

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¹ Some philosophers distinguish ‘aesthetics’ from ‘philosophy of art’, where the first might refer to issues of beauty, value, and certain types of experiences of artworks and other objects. ‘Philosophy of art’, in contrast, is sometimes used to refer to general philosophical issues (often metaphysical and epistemological) concerning artworks and art practices. Others use these terms interchangeably. This paper will follow the latter convention, except where a distinction is needed.

² The Sloan Report is an unpublished report, commissioned by the Alfred P. Sloan Foundation in 1978, on the then state-of-the-art of cognitive science (see Harnish 2002: 4–8; Miller 2003).

³ ‘Computation’ is generally understood in a technical sense, involving rule-bound processing of symbolic representations.

⁴ Much important research at the intersection of cognitive science and art is left out of the present analysis. For work on imagination see, among others, Currie 1998, 2004; Walton 1990; Nichols and Stich 2000, 2003; Currie and Ravenscroft 2002; Nichols 2004, 2006. On emotion, see Goldie 2000, 2002, 2005; Meskin and Weinberg 2003; Prinz 2004; Robinson 2005. On evolution, art, and culture see Mithen 1996, 2005; Tomasello 1999; Currie 2004; De Sousa 2004; Carruthers et al. 2006, 2007. On creativity, see Simonton 1999; Carruthers 2002, 2007; Gaut and Livingston 2003; Boden 2004; Sawyer 2006; Stokes 2007.

⁵ Dretske's account appeals to a distinction made by philosopher and linguist Paul Grice (1957). Some things have a meaning independent of human agents. The rings on a tree mean – we might say *indicate* – that the tree is such-and-such age, no matter if we see or use those rings in any way. The rings have a *natural meaning*. Language, in contrast, has its meaning only by virtue of convention: human language practices. Words and sentences have *non-natural* meanings.

⁶ Myin provides an editorial introduction for papers from the 'Cognitive Science Conference on Perception, Consciousness, and Art' at the Free University of Brussels in 1999, published in a special issue of *Journal of Consciousness Studies* entitled 'Art and the Brain II'.

⁷ See Carroll 1992; Levinson 1992; Nathan 1992; Currie 1993; Stecker 1997, 2003.

⁸ Minimal communicative intentions operate like Gricean constraints on communication in the sense that the audience for a work of art must assume that the artist intended her work for a certain type(s) of interpretation (see Schier 1986). In Levinson's (1996: 188–9) terms, recognizing an artist's *categorial* intention – that a work is to be interpreted as a member of some artistic category *C* – is necessary to but not sufficient for determining the meaning of a work.

⁹ It should be noted that Rollins explains interpretation in ways explicitly less dependent upon representations. This kind of approach is discussed in §3 later.

¹⁰ Much of audio recording satisfies these conditions, which Kulvicki understands as picturing audible properties.

¹¹ Perceptual imagery is yet another candidate common capacity. See Currie's (2003) 'Aesthetics and Cognitive Science', which pays considerable attention to imagery. Currie's work on the intersection of aesthetics and philosophy of mind has consistently argued for the importance of a cognitive science of imagery to philosophical aesthetics (see also Currie 1995; Currie and Ravenscroft 2002: 71–107.)

¹² Gombrich attributes this general category of view to a number of 19th century artists and thinkers. In particular, the impressionists championed the view that they painted the world 'as we really see it'. Ruskin (1843; see also Gombrich 1961: 11–12) was responsible for coining the 'innocent eye'.

¹³ Jerome Bruner is best known for advancing the New Look movement in psychology (see Bruner (1957); see also Bruner and Goodman 1947; Bruner and Postman 1949).

¹⁴ In a symposium entitled, 'The Historicity of the Eye', Arthur Danto provides the target article, with criticism by Noel Carroll, Mark Rollins, and Whitney Davis (Carroll 2001; Danto 2001; Davis 2001; Rollins 2001). The historicity of the eye is, for some of the analyses in this symposium, just the contrary of the innocent eye. However, the *analysandum* is not consistent across Danto's foils, Danto's analysis, and his critics' analyses. Indeed, at least three claims may be distinguished. The eye may be historical in the sense that: (a) vision is *evolutionarily* plastic and the history of art has shaped that evolution; (b) vision is *developmentally* plastic and exposure to and engagement with an art culture shapes that development; (c) vision is cognitively penetrable, where art-relevant cognitive states and capacities influence visual experience. As Danto interprets and criticizes him, the primary proponent of the historicity of the eye, Marx Wartofsky (1980, 1984), intends a claim like (a). However, Carroll argues that in spite of Danto's criticisms, Wartofsky may have meant something weaker than (a), and Rollins suggests that in criticizing Wartofsky's claim as (a), Danto unnecessarily imports issues about modularity and cognitive penetrability more relevant to claim (c). In any case, the innocent eye opposes the historical eye only if the latter is understood as claim (c).

¹⁵ The issue of (non)conceptual content is also relevant, it should be noted, for theories of subpersonal mental representation (e.g., tacit knowledge of rules of grammar) and animal cognition. See Bermúdez and Cahen (2008) for an overview.

¹⁶ There is no one agreed upon analysis of (non)conceptual content, just as there is no one agreed upon analysis of either concepts or content. For two useful discussions of some of the relevant decision points, see Byrne (2005) and Bermúdez and Cahen (2008).

¹⁷ In addition to the several mentioned before and later, analyses of the conceptual content question include: Evans (1982); Cussins (1990); Crane (1992); McDowell (1994); Tye (1995, 2006); Stalnaker (1998); Brewer (1999); Peacocke (2001); Matthen (2005); Chuard (2007); Heck (2007). Ron Chrisley maintains a running bibliography on nonconceptual content at: <http://www.cogs.susx.ac.uk/users/ronc/ncc-bibliography.html>.

¹⁸ The general question of nonconceptual representational content is also, some suggest, fundamental to cognitive science in at least two ways. First, a dominant Chomskyan research program in cognitive science attributes subpersonal representational states to agents who would lack the constituent concepts of those states. This would seem to imply nonconceptual representational states (Stich 1978; Davies 1989; Bermúdez 1995; Raftopoulos and Müller 2006; Tye 2006). Second, some argue that *classical* models of cognitive science only yield psychological explanations

that are conceptualist in character. This is inadequate for any kind of connectionist approach to cognitive science (Cussins 1990).

¹⁹ A number of nonconceptualists today appeal to considerations of fine-grainedness of experience. For a fully developed account, see Heck's (2000) *richness argument*. See also Peacocke (1992) and Bermúdez (1995); see Kelly (2001) for a critique of appeals to fineness of grain; see De Clercq (2000) for criticism of Raffman.

²⁰ See also, DeBellis (1999), which offers important criticism of Lerdahl and Jackendoff's (1983) work on generative rules for musical experience. Tillman and Bigand (2004) argue that implicit, rather than explicit, musical knowledge influences the experience of music. Also, Davies (2004) provides a brief analysis of the types of procedural knowledge (and their conceptualization) involved in musical performance.

²¹ For other 'combined' theorists, see Ballard (1991) and Hooker et al. (1992). See also the theorists discussed next in relation to Milner and Goodale's research on distinct information-processing streams in the brain.

²² Rollins categorizes Ramachandran (1990), Churchland and Sejnowski (1992), Kosslyn (1994), and Zeki (1999) as internalist theories.

²³ Rollins categorizes Cutting (1986) and Ballard (1991) as externalist theories.

²⁴ Campbell (2002) argues for similar demonstrative reference in visual experience.

²⁵ This enactive theory of perception is fully developed in Noë (2004). See also O'Regan and Noë (2001).

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