The Development of Taste and the Mathematical Aesthetic

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Abstract

Beauty, elegance, parsimony, and other aesthetic properties are commonly attributed to the theorems, proofs, and other products of working mathematicians. Although this was well-known to the ancient Greeks, has been well-documented in recent years by philosophers of mathematics, and is experienced firsthand by mathematicians themselves, the use of aesthetic language often strikes the uninitiated as strange or surprising. In this paper,

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Introduction

I want to discuss several different things in this paper

- What is taste? - Hume, Bordieu, Kant...
- How is taste acquired? (Maybe mention McAllister and Michele (2005)?)
- The development of taste in evaluative judgments
- The development of taste in generative judgments (Thomas argues that interest is more important than beauty in these judgments, along with Poincare and Hadamard as referenced in Sinclair)
- The development of taste in motivational judgments
- The distinction between "interesting" and "important", as indicated both by Hardy and Thomas
- Conjunctive vs disjunctive accounts of aesthetic judgment

In considering the study of the philosophy of mathematics, Shapiro (2000) characterizes the view that philosophy "precedes" or "determines" practice as the *philosophy-first* paradigm. For example, those who subscribe to the view that modern mathematical discourse is incoherent due to unsound metaphysical or logical presuppositions, and that the field should therefore be revised to conform to first principles determined by philosophy, would be considered to be working within the philosophy-first paradigm. Many (if not most) philosophers, and certainly most mathematicians, reject this paradigm. For the purposes of this paper, I also reject this view and instead hope to provide a coherent, post-hoc account of the aesthetic experience of mathematicians. One interesting consequence of this approach is that empirical observations of mathematicians' aesthetic experiences become relevant to the discussion, and the surveys conducted by Inglis and Aberdein (2015) of contemporary research mathematicians will be used to support several of my arguments.

While the results of Inglis and Aberdein (2015) are fascinating, it is important to note that their empirical semantics do not compare the way in which mathematicians use aesthetic language to the way in which non-mathematicians use aesthetic language. As a result, while they seem to have shown that individual mathematicians do use aesthetic language to describe mathematical objects and procedures in consistent ways—in particular, that there are at least four different dimensions along which they classify these mathematical structures—, they have not shown that this use of language is either consistent or inconsistent with the use of aesthetic language in other domains.

I want to argue that a disjunctive view of the relationship between aesthetics and epistemics in mathematics and science is entirely plausible, and provides a sufficient explanation for the use of aesthetic language in mathematics. This contradicts the view espoused by Todd (2008), who argues that the use of aesthetic language in mathematics is entirely epistemic in nature. As particular counterexamples, I will use the instances in science of past models which were, and could still now be, considered beautiful (such as the Ptolemaic model of the solar system or the notion of a pervasive, light-conducting ether permeating the universe) and within mathematics, the entire Hilbert programme as an instance of a beautiful, but false theory. Since we also have plenty of examples of "ugly" truths in both mathematics and science, this seems mostly sufficient to demonstrate the validity of the disjunctive model of aesthetic experience in mathematics and science.

However, I'm pretty sure there have to be some sort of flaws in that logic, since it seems so simple and easy. I know I can also draw on the work from Inglis and Aberdein (2015) to support my conclusions, but I think there are deeper reasons for which Todd (2008) rejects the disjunctive model. I think I need to address those reasons, but I'm not currently in a sufficiently awake state to do so. I'll try to get back to this tomorrow.

References

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