

Form and Content in Mental Representation

Mark Simms

Philosophy, Adelaide University

June, 2004

Acknowledgements

My thanks to Gerard O'Brien (principle supervisor) and Jon Opie for supervising this thesis and providing the intellectual environment and framework within which it was constructed. Their enthusiasm for resemblance in representation always kept me thinking. Although we were often in dispute over the matters of this thesis, we shared an interest in them and the assumptions behind that interest about what is important in philosophy. They same thanks go to Greg O'Hare and Philip Gerrans. Finally, I'd like to thank the congenial staff and graduate students of the Philosophy Department at Adelaide University.

Introduction: Form and Content.....	6
Chapter 1. What counts as a representation?	12
The high and low roads to representation	12
Tacit and implicit representation	30
Chapter 2. The psycho-syntactic tool kit	36
Intrinsic and relational syntax	36
Millikan’s relational syntax	42
The connectionist version of constituent structure	46
How should we identify representations?	59
Chapter 3. The big picture: does cognition explain representation or does representation explain cognition?	63
The psycho-semantic tool kit	63
Cognitive science’s chicken and egg problem.....	68
Resembling structure	72
Some broad options for resisting Cummins.....	74
Chapter 4. In more detail: two (and a half) responses to Cummins	77
Response 1: Bringing implicit content to cognition	77
Response 2: Content and functional explanation.....	87
Response 2½: The co-determination of content and use	94
Chapter 5. Abstract representation.....	96
Capturing abstract properties	96
Abstract representation in smart search	109
State Space Semantics and reductionism.....	115
Chapter 6. Combining Representations.....	119
The trials of combination	119
The benefits of representing intrinsically in combination	124
Chapter 7. Tracking.....	129
Keeping track of constancy within change	129
Tracking in analogical reasoning	137
An alternative approach to tracking: effects don’t have to reflect their causes.	147
Chapter 8. How resemblance could drive cognition	154
Weight State Semantics	154
Should we be suspicious of weight states as representations?.....	156
Conclusion	162

Abstract

It is orthodoxy in contemporary philosophy of cognitive science to hold that the human brain processes information, both about the body in which the brain is located and about the world more generally. The internal states of the brain that encode this information are known as mental representations. Two matters concerning mental representation are interwoven here: the role of representational content in cognition and the format of mental representation. Robert Cummins, among others, argues that content is intrinsic to mental representation, rather than involving matters external to a representation, such as the use to which the representation is put. He also holds that resemblance accounts of representation best make sense of this fact. Thus, according to Cummins, the content of a mental representation is determined by its form.

This thesis argues that an account of representation requiring that representations possess resembling structure is unlikely to be correct given (a) the minimal requirements that something must meet in order to count as a mental representation, (b) the tasks required of representation in cognition, such as capturing abstract properties, combining with other representations, and tracking change, and (c) the possibility that content stands in a different relation to form and cognition from the one Cummins has in mind. In criticising Cummins, however, this thesis explores possible implementations of resemblance theories in connectionist representation. It also redraws his map of the psychosemantic field to suggest that classical theories of cognition, which posit concatenative schemes of symbolic representation, share some of the benefits of tying content to form. Finally, in exploring various notions of the role of form in representation, this thesis also advocates a pluralistic approach to the mental representations implicated in human cognition.

Declaration

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university and to the best of my knowledge and belief, the thesis contains no material previously published or written by another person, except where due reference is made in the text of the thesis.

I give consent to this copy of the thesis, when deposited in the Library, being available for photocopying and loan.

Mark Simms