ABSTRACT. There is a prevalent notion among cognitive scientists and philosophers of mind that computers are merely formal symbol manipulators, performing the actions they do solely on the basis of the syntactic properties of the symbols they manipulate. This view of computers has allowed some philosophers to divorce semantics from computational explanations. Semantic content, then, becomes something one adds to computational explanations to get psychological explanations. Other philosophers, such as Stephen Stich, have taken a stronger view, advocating doing away with semantics entirely. This paper argues that a correct account of computation requires us to attribute content to computational processes in order to explain which functions are being computed. This entails that computational psychology must countenance mental representations. Since anti-semantic positions are incompatible with computational psychology thus construed, they ought to be rejected. Lastly, I argue that in an important sense, computers are not formal symbol manipulators.

1. INTRODUCTION

In From Folk Psychology to Cognitive Science (1983), Stephen Stich argues that there is no scientifically respectable method for attributing semantic content to psychological states. Because of this, he advocates the radical position of rejecting semantics and semantically interpreted states (such as propositional attitudes) from cognitive psychology. Cognitive psychologists, on his view, ought to construe cognitive processes purely syntactically. If Stich is correct, future cognitive scientists will have theories that do not countenance mental states with content, i.e., theories that do not countenance mental representations. For philosophers such as Fodor and Pylyshyn, who advocate representational theories of the mind, this would be catastrophic.¹

Stich's view, however, is much more sweeping than it first appears. If he is correct, then not only will representational theories have to be rejected, but, I claim, all of computationalism will have to be rejected as well, because computationalism – the thesis that cognitive capacities are best explained in terms of capacities to compute certain functions – requires us to posit and semantically interpret mental states and mental processes. A success for Stich is thus much more than a disaster for Fodor and Pylyshyn. Rejecting computationalism would affect all of cognitive psychology. Psychologists in fields as diverse as
problem solving, perception, imagery, memory, language understanding, and developmental psychology would have to completely change their methodology. 2

In this paper I will argue that computationalism does in fact require us to posit and interpret mental states and structures, and I will present a strategy for doing this, the "computational strategy". This strategy is used in both the computational and cognitive sciences. In practice, therefore, computer and cognitive scientists attribute semantic content in the course of producing scientific explanations. (In my opinion, this is a good prima facie reason for being skeptical about arguments such as Stich’s.) I will argue that the computational strategy is used because it provides cognitive scientists with a scientifically respectable method for attributing contents of computational, psychological states. If my argument is correct, then there are good reasons for embracing semantics and remaining computationalists, and we may reject current arguments to the contrary.

My view, however, is also more sweeping than it first appears. The necessity of semantic attribution within the computational paradigm is not generally acknowledged. The main reason for this, I think, is that computers themselves are widely regarded as formal symbol manipulators or syntax machines, manipulating symbols independently of their content. If my argument is correct, then to understand computers we must ascribe contents to their internal functioning. This means that computers cannot be understood as formal symbol manipulators. Therefore, in my view, not only is Stich wrong in claiming that there is no scientifically respectable method for assigning contents to mental states, but the dominant view of computers is also in error. 3

In Section 2, I present two of the problems Stich sees for countenancing representational mental states. My primary concern is not these problems per se, but rather the general intuition they are intended to foster that semantic attribution is scientifically suspect. My arguments that semantic attribution is scientifically respectable and necessary for computationalism is presented in Section 3. Finally, in Section 4, I discuss the consequences of my argument for the view that computers are formal symbol manipulators.

2.

Stich sees two fundamental problems with attributing semantics to mental states. The first is that a scientific psychology must generalize