Commentary/Humphreys & Evett: Evaluating dual-route theory

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It seems like only yesterday that we middle-of-the-roaders were defending a dual-route model against those who denied the existence of an input lexicon for print. Reading was seen as parasitic upon speech, and so there had to be a grapheme-to-phoneme conversion before anything else could happen (see Coltheart 1978; 1980b). The old single-route theories died a natural death because they just couldn’t address large portions of the relevant data. We now find ourselves in the middle of a brief upsurge of enthusiasm for a single-route theory of the opposite kind, analogy theory. Glushko (1981), Henderson (1982), and Marcel (1980) have all made fairly clear statements of principle leading them to explore theories of reading in which there is only a lexicon and no means of mapping between orthography and phonology outside the lexicon. By this principle there are no explicit representations of submorphemic mappings that express generalities about the language. Nothing, that is, of the form b → /b/ can be found.

In the past, the central issue was not that of single versus dual, which was just a consequence of underlying theoretical questions. In the target article the fundamental questions appear to be, first, whether the processing of nonword letter strings could proceed solely with a set of simple grapheme-to-phoneme rules and, second, whether lexical and nonlexical processing could be completely independent and noninteractive. The answers to both questions are fairly trivially no, given even the current quality of data. However, by some sleight of hand, Humphreys & Evett (H & E) turn their target article into an attack on the principle of dual routes. To do this they have to legislate as to what dual-route theorists are allowed to do, and, in consequence, they distort the debate.

H & E take any evidence of lexical influence on nonword reading as supporting single-route models. There are two fallacies here. The first is that of mistaking historical influences for current ones. The notion of regularity itself is lexical in origin. There is no source other than our experience of words from which GPC rules could be derived, whatever form we conceive them to have. In the same way, many of the lexical influences seen in nonword reading will reflect the influence of lexical knowledge on the development of the nonlexical system.

The second fallacy involves the confusion of processing with representations. This is revealed initially in H & E’s figure, in which the result of grapheme–phoneme conversion is “speech.” No serious dual-route theorist would put forward such a suggestion. What is independent in dual-route models is the knowledge (or processes) that convert from an orthographic code to a phonological code. But it is a long way from that to speech, with ample opportunity for interference on the way. To interpret interference as forcing a single-route theory is rather like interpreting the Stroop (1935) data as demonstrating that colour recognition and word recognition are carried out by the same system!

The climax of H & E’s restrictive practices comes when they end up adopting as a pure lexical theory the Shallice, Warrington, and McCarthy (1983) “multiple levels” model. In the Shallice et al. model the conversion from an orthographic code to a phonological code is mediated by spelling-to-sound correspondences both at the morpheme level (i.e. lexical) and at all other levels down to the grapheme. But the Shallice et al. position contains the essential feature of a nonlexical route, that of independence of the sublexical levels from the lexical. In this respect it differs from analogy theories, which, if they have sublexical components (e.g. Marcel 1980), do so only within lexical entries. Whether one regards the Shallice et al. model as single or dual route is purely notational and could never be a substantive issue.

The central issue of the paper remains unclear. Is it really to establish that there is only incomplete functional independence of lexical and nonlexical processes? Is such a claim really worth all this fuss? And, in particular, is it helpful to go from such a claim (easily conceded) to one in which there are no nonlexical processes? Even supposing we had been offered the beginnings of a purely lexical model, such an extreme claim could be met by the arguments H & E themselves have offered, but with the polarity reversed. Thus, although the evidence of double dissociation of reading skills is consistent with breakdown in “particular operational procedures that may use a common knowledge source,” it would be equally consistent with separate knowledge bases.

The pity of it is the waste. What H & E could have done with the material on hand was to specify a minimum requirement for a dual-route theory. In particular we could have been treated to a review of their own excellent empirical work and its implications for any model of word recognition, single or dual route.

A better attack on dual-route theory can be found in Patterson and Morton (1985). In this paper we list the four main findings that the simple dual-route theory cannot account for. We then specify the minimum additions that are necessary to account for the data in question. For monosyllables we need to add a “body” system to the grapheme–phoneme rule system and then a simple decision algorithm to decide among the alternatives in the response buffer. We also need to keep some influence of the lexicon during the reading of nonwords, but this appears to be limited to the erroneous triggering of single lexical items rather than every lexical item with the faintest resemblance, as seems to be required by Marcel’s (1980) pure lexical theory. With the resulting model we give a good account of all the difficult data (except the results of Rosson 1983). Of course, if Humphreys & Evett want to call this model a single-route model, they are entirely welcome to do so.

So the “strong” theory loses. But are there any winners?

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In evaluating the “strong” version of the dual-route theory Humphreys & Evett (H & E) have made much of the fact that