Looking for logic in all the wrong places: An investigation of language, literacy and logic in reasoning
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Conclusions

Summary

The dissertation opened in Chapter 1 with a fresh analysis of reasoning behaviour in subjects with varying but low educational levels. We saw that Luria’s blanket negative conclusions about such reasoners can be replaced by a more informative account which takes into account the semantic and pragmatic constraints in the task which shape subjects’ responses, including matters such as the anomalous epistemic structure of the question-answer interaction, the various readings possible for the generalisations expressed in the major premises, and the relation of the protagonist to this generalisation. The analysis indicated that the commonalities with schooled subjects are much greater than previously reported. In Chapter 2 the remaining differences between groups, specifically the observed differences between all and if premises, were explained by an original and exploratory synthesis of corpus analysis with semantic theory.

Chapter 3 contextualised the results from these chapters in the broader debate about the cognitive consequences of literacy, and considered some of the manifold social and cultural dimensions which feature in a full account of literacy’s effects. This prompted a ‘local’ approach to theorising, in the form of the evaluation of a very specific proposal from David Olson, namely that the results from reasoning research signify ability to distinguish ‘literal’ meaning, in the form of ‘what is said’, from ‘what is meant’. Although this was found to be an attractive suggestion, it was argued that the notion of ‘literal meaning’ has been understood too simplistically, in its role in reasoning tasks.

A more qualified understanding of literality was outlined in Chapter 4, and the resultant decoupling of literal meaning from logicality in reasoning tasks was described. This formed a key part of the chapter’s more general critical examination of the theoretical underpinnings of mainstream reasoning research. Assumptions such as that logical form is given by grammatical form, that there is a clear and unchanging division between the logical and non-logical, or contentful, parts of
natural language, and the identification of logical reasoning with classical logical norms, were interrogated and repudiated. It was proposed that the schooled stance towards reasoning tasks, described as reasoning Logically, has served as an overly narrow description of a more basic ability to generate and manage meaning, an ability in which interpretation and reasoning are intrinsically connected, and that this is more aptly seen as the locus of logic in reasoning.

Finally, in Chapter 5 this approach was applied to an analysis of qualitative data from a small study of Wason’s selection task and a number of variations on it. Wason’s selection task has been an important source of evidence for negative conclusions about reasoning. The last chapter challenged these, by describing plausible interpretations of the linguistic materials as well as broader matters of task construal, in an effort to show that the range of responses observed reflects full engagement with the task and a similar concern for semantic parameters observed in the subjects reported in the opening chapters. In this way, the common basis to behaviour across different subject groups became more apparent.

Finding logic

The introduction sketched a situation in reasoning research for which Krueger and Funder’s (2004, p. 318) contention that “only irrationality is newsworthy” seemed pretty accurate. In the course of the current study we have seen that the focus on negative findings is accompanied by fluctuations in classifications of logical ability. When Luria and Scribner investigated the reasoning behaviour of illiterate farmers, they contrasted it with their educated peers, who were found to be exemplary reasoners. But researchers who have concentrated their investigations within highly educated subject populations have documented failings judged at least as serious as Luria’s findings. In the introduction we read of Wason’s despair at his undergraduate subjects: “What makes people so narrow minded and so cognitively prejudiced? Why did they find these trivial games so difficult?” (Wason, 1968b, p. 172) – it feels as if this exclamation could just as well have come from Luria’s writings. It can seem that reasoning researchers have directed their energies towards wherever they find the errors, and thus seem to uncover more and more irrationality in human reasoning.

In this dissertation I sought to provide a counterbalance to the catalogue of reasoning errors. The aim was not to show that everyone is logical all the time, but to provide a more constructive and nuanced account of the role of logic in reasoning behaviour. But I would go so far as to say that as researchers of human reasoning, it is our job to make rationality newsworthy. The burden is on us to find the sense in what our subjects do, not to try to trick them out. This approach changes what counts as an interesting result. When we look for logic in semantically-driven interactions, the details of a particular interpretation, the justification given by the subject for it, and the support that can be found
for it in everyday language use, become essential means to assess the adequacy of a subjects’ response and are no longer viewed as unconnected or detracting from the logical aspects of it. There is moreover plenty of logic to be found, as I hope to have convinced you over the course of this work. Subjects engage fully with presented premises and set semantic parameters appropriate both to their linguistic experience and to their construal of the task. The range of choices available to subjects sometimes reflect their educational background, for instance, in the varying ease with which subjects accepted an *all* premise as expressing a law-like generalisation – as described in Chapter 2 – but more often reflect their individual ability to set and reset semantic parameters in a self-controlled fashion, demonstrated in both Chapter 1 and the last chapter, Chapter 5.

As we saw in Chapter 4, the context-dependence of meaning, and the dynamic character of interpretation that it entails, has implications for the status of classical norms for reasoning, since they are assumed to be determined by the literal meaning of the premises. Once literal meaning loses its sovereignty as bearer of logicality, the criteria for an account of good reasoning change. On this account reasoning skills are to be judged on skill in discerning differences between interpretations and fitting them to the task at hand in the best way possible, including ability in matching conceptual distinctions within an interpretation with those which the situation requires, creativity in articulating and constructing possible interpretations, in particular other than the default which may be derived from typical language use, and insight into the consequences of adopting specific interpretations. This is not the same as saying that reasoning is domain-dependent; it is to say it is done so on the basis of parameters which are set according to the task at hand, in the process of constructing meaning. It also entails that for many other behaviours which have been labelled as systematic ‘reasoning errors’, this has been done so in haste, and they might also be rehabilitated when semantic analysis is applied to them.

There are broader implications of this account of reasoning and its relation to language and literate practices. Firstly, we should do away with the idea that language is stable and monolithic, and take seriously the dynamic nature of meaning. This impacts on the way that languages are studied, as well as the way they are taught, in both cases by removing the search for, or teaching of, some kind of a linguistic bedrock, the same for speakers across contexts, which, as we have seen, massively underestimates the interpretational flexibility language users have at their command. Secondly, the findings here suggest that although education is largely a matter of learning new ways of using symbolic systems, this learning is something which occurs quite locally and sporadically. I think that this is so because these new ways with language are taught with only a vague sense of why such an enterprise is valued, and how it connects with what we do when using language. A better understanding of our meaning-making behaviour will make education more able to connect up with what we do anyway, and thereby more able to effectively contribute to cognitive development.
Where to next

Apart from the specific experimental suggestions to be found at the end of each chapter, there are some natural avenues for further research suggested by the dissertation as a whole. Firstly, studies which extend the analysis of language used in cognitive tasks and relate it to general language use would be very valuable. In other words, further investigation of the relation between language used for thinking and language used for talking. Factors underlying subjects’ behaviour do not lie within neat disciplinary boundaries: processing constraints presumably affect choices just as much as conscious deployment of learnt standards of reasoning, as well as, as we have seen, automatic attribution of linguistic meanings, and socio-pragmatic norms. Hence, further research can probably best be done in collaboration with linguistic researchers, primarily semanticists, but psycholinguists and sociolinguists could also help bridge the gap between language use for thinking and language use for communication purposes.

Secondly, the qualitative data presented here yield many ideas for further quantitative studies, and these should be followed up on, although I think that a combination of both qualitative and quantitative data collection remains optimal for this area of research. With the less educated subject populations quantitative research is difficult both because it is difficult to find suitable populations and because of the necessarily verbal nature of the testing, but as we saw in Chapter 3 simply broadening the subject profile beyond the student undergraduate already produces a range of linguistic behaviours which have not been fully investigated. The suggestion would be to conduct a broader range of quantitative tasks – including for instance, interpretation-oriented tests – with a broader range of subjects.

Finally, it would be very constructive to provide appropriate formalism for the analyses given here of subject behaviour. Partial suggestions in this direction were made in Chapter 1, but these should be greatly extended to a more complete formal model of reasoning behaviours. Apart from the benefits in terms of precision and perspicuity regarding claims and predictions, this is important because it allows the common features of diverse cognitive tasks to be identified, especially tasks classified under problem-solving, decision-making and such like. These are traditionally separate areas of study, while it is fairly obvious that they share many features of reasoning tasks. Stenning and van Lambalgen (2008) have already, by the use of a specific formal apparatus, been able to model features shared by diverse tasks such as the false belief task and the suppression effect task. Continuing in this vein is essential if we are to develop a more unified theory of human cognition.