AN ANALYSIS OF INDEFINITE PROBABILITY STATEMENTS

ABSTRACT. An analysis of indefinite probability statements has been offered by Jackson and Pargetter (1973). We accept that this analysis will assign the correct probability values for indefinite probability claims. But it does so in a way which fails to reflect the epistemic state of a person who makes such a claim. We offer two alternative analyses: one employing de re (epistemic) probabilities, and the other employing de dicto (epistemic) probabilities. These two analyses appeal only to probabilities which are accessible to a person who makes an indefinite probability judgment, and yet we prove that the probabilities which either of them assigns will always be equivalent to those assigned by the Jackson and Pargetter analysis.

1. INTRODUCTION

There are three students in my class: Tom, Dick and Harry. A member of my class has 0.8 probability of passing (or, equivalently, there is a probability of 0.8 of a member of my class passing). This is what is known as an indefinite probability statement: ‘a member of my class passing’ is not a proposition. It does not have a truth-value, or specifiable adequate truth-conditions.

Such indefinite probability statements are not uncommon, nor are they impotent in practice. A man of 40 has a 0.9 probability of reaching 50, and this is used by insurance offices to calculate risks and premiums. An Australian Prime Minister has a 0.6 probability of being re-elected, and this can be used by a bookmaker to help determine odds for bets.

The fact that, on the surface, indefinite probabilities seem to ascribe probabilities to “indefinite statements” rather than to propositions would not be problematic if a paraphrase were always available which reveals a “deep” structure in which probabilities are ascribed only to propositions. But the challenge is to find such a proposition (or propositions), and to determine the probability (or probabilities) ascribed to them. All the appealing simple moves fail. As no member of my class need have 0.8 probability of passing, we cannot ascribe 0.8 probability to any of ‘Tom will pass’, ‘Dick will pass’, or ‘Harry will pass’. Nor is it that there is a 0.8 probability that some member of the
class will pass (it is higher than 0.8) or that all members of my class will pass (it is lower than 0.8).

A paraphrase does not seem to be available by moving to any straightforward statement concerning relative frequencies. It cannot be that 80% of the class will pass (there are three members!!). And it cannot be that in the long run 80% of my class will pass, as this may be my only class, or it may be that this class is different from any other class.¹

There are really two problems with indefinite probabilities. First, we need some account of the logical form of indefinite probability statements, since because they are indefinite, we have no immediate insight into their logical structure. Second, we should attempt to find an account of their logical structure which ascribes probabilities to propositions. This is because we assume that an adequate analysis will reveal that indefinite probabilities are epistemic in nature. It is determined that whether each of Tom, Dick and Harry passes or fails, no objective chances are involved. All of the results of the class are determined, but our beliefs about who will pass and fail are not held with certainty. An analysis in terms of the ascription of probabilities to propositions would allow a straightforward interpretation of such probabilities as degrees of belief (or degrees of rational belief). Of course, for an analysis to be epistemic in nature does not require the ascription of probabilities to propositions. Corresponding to de re and de se beliefs, there must be de re and de se probabilities.² However it would be simplest and most convenient if our analysis offered a de dicto form.

2. THE JACKSON-PARGETTER ANALYSIS

Jackson and Pargetter³ have offered an analysis of indefinite probability statements.

An A has a probability of p of being a B,

is to be analysed as

\[ \sum_{s=1}^{n} p_{s/n} \cdot \frac{s}{n} = p, \]

where \( p_{s/n} \) is the probability that the ratio of A's which are B's among \( n \) A's is \( (s/n) \).