

Baseball, pessimistic inductions, and the turnover fallacy

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Among the niftiest arguments for scientific anti-realism is the ‘pessimistic induction’ (also sometimes called ‘the disastrous historical meta-induction’). Although various versions of this argument differ in their details (see, for example, Poincare 1952: 160, Putnam 1978: 25, and Laudan 1981), the argument generally begins by recalling the many scientific theories that posit unobservable entities and that at one time or another were widely accepted. The anti-realist then argues that when these old theories were accepted, the evidence for them was quite persuasive – roughly as compelling as our current evidence is for our best scientific theories positing various unobservable entities. Nevertheless, the anti-realist argues, most of these old theories turned out to be incorrect in the unobservables they posited. Therefore, the anti-realist concludes that with regard to the theories we currently accept, we should believe that probably, most of them are likewise incorrect in the unobservable entities they posit. (This argument appeals to what our best current theories say about unobservables in order to show that the entities posited by some earlier theory are not real. So the argument takes the form of a *reductio* of the view that the apparent success of some scientific theory justifies our believing in its accuracy regarding unobservables.)

Of course, this argument has been criticized on many grounds. Some have argued, for instance, that the scientific theories we currently accept are much better supported than were earlier scientific theories at the time they were accepted. In addition, some have argued that many scientific theories accepted justly in the past were in fact accurate

in positing various unobservables, although the theories may have been seriously mistaken in the properties they went on to ascribe to those unobservables (Kitcher 1993, Leplin 1997). I shall not review this literature here (see Psillos 1999); my concern is not with whether these replies succeed in undermining the pessimistic induction. For whether or not these replies succeed, they are aimed exclusively at the scientific anti-realist's pessimistic induction. There are many other pessimistic inductions to which replies like these are inapplicable.

For example, consider this pessimistic induction: Most of the persons who have ever managed major-league baseball teams, and have by now ended their careers, ended them having lost more games than they had won. Therefore, regarding the managers currently in office, we should believe (in the absence of any further information about them) that probably, most of them will likewise end their careers with losing records. To this argument there is no reply analogous to pointing out that the scientific theories we currently accept are much better supported than the scientific theories accepted justly in the past. No one would argue, I think, that today's baseball managers are generally more promising than in former days. Likewise, no help will come from anything like distinguishing a theoretical term's having a referent from its referent's being accurately described by the theory. My concern is with pessimistic inductions generally.

Anti-realists themselves should be interested in understanding pessimistic inductions generally, since an inductive sceptic could offer a pessimistic induction against anti-realists and realists alike. That argument considers all of the scientific theories that have ever at some time or another been widely and justly believed to be empirically adequate, on the strength of evidence that was at the time roughly as

compelling as our evidence is now for the theories we currently accept. Most of these theories eventually turned out not to be empirically adequate. Therefore, we should believe that probably, most of the theories we currently accept are not empirically adequate either.

Pessimistic inductions can obviously be offered regarding many sorts of things. On my campus, for instance, most of the various student organizations that have at one time or another been officially registered have never possessed a membership roll longer than fifty. Hence, regarding the student groups currently in existence, we should believe (in the absence of any further information) that probably, most will never grow beyond fifty members. My point is not going to be that such a conclusion cannot be justified. But I wish to point out a fallacy involved in arguing for it through this sort of pessimistic induction.

The key to this fallacy is turnover. For the sake of simplicity, suppose that at each moment in the history of science, the number of theories that are justly receiving wide acceptance remains the same (though the identities of these theories may, of course, differ from moment to moment). Let that constant number be N . (Admittedly, it is difficult to see how to count theories precisely, but since the pessimistic induction itself refers to '*most* theories adopted in the past,' I too shall presume that theories have some criterion of individuation.) Obviously, theories that were accepted at some earlier moment, but are now believed to be false, must have been rejected sometime in the intervening period. On the other hand, many theories that were accepted at some earlier moment, and are also accepted now, were never rejected in the meantime. Therefore, since theories currently believed false have generally experienced more rapid turnover

than theories currently accepted, the past contains more room for theories currently believed false than for theories currently accepted. It would be very easy for there to be more than N theories that were accepted sometime in the past but that have by now been rejected as false. If, for each theory currently accepted, there were (for example) two predecessors that were once accepted but have since been discarded, then fully two-thirds of the theories accepted at some time or other are currently believed false.

The same point about turnover applies to other pessimistic inductions. Baseball managers with losing records are more likely to lose their jobs than managers with winning records. Accordingly, it is to be expected that the past will contain more managers with losing records than with winning records. Likewise, campus student groups with fewer members are more likely to go extinct than groups with many members, so as the years go by, smaller organizations are more apt to come and go than groups that at some stage achieve large memberships. Consequently, there will over all time have been more groups that remain small than groups that become large.

It is therefore quite easy for the historical premise of a pessimistic induction to turn out to be true – far easier than it ought to be for the induction to go through. That is because the historical premise of a pessimistic induction is a *cumulative* claim, lumping together cases from all past moments. For example, here is a well-known statement of the anti-realist's premise:

I daresay that for every highly successful theory in the past of science which we now believe to be a genuinely referring theory, one could find half a dozen once successful theories that we now regard as substantially nonreferring. (Laudan 1984: 123)

However, a pessimistic induction of a somewhat different and less familiar form is made impervious to the turnover fallacy by employing a historical premise that is not cumulative: at most past moments, most of the theories receiving wide acceptance at that moment are false (by current lights). Then by induction, we should conclude (in the absence of other relevant information) that the current moment is probably no different: most currently accepted theories are false. Since this argument considers past theories moment by moment rather than cumulatively, turnover is irrelevant. In the premise of this inductive inference, a current theory that has long been accepted will count not just once in the cumulative grand total, but rather once with regard to each of the past moments at which it was receiving wide acceptance.

Of course, though, that most theories accepted at some time or other are false (by current lights) does not entail that at most moments in the past, most of the theories then accepted are false (by current lights). It could well be that for a typical past moment, most of the theories then receiving wide acceptance remain accepted currently, but because of the turnover rate among the other theories, most of the theories that have ever been accepted have been rejected by now. Likewise, that most baseball managers in history accumulated losing records does not entail that at most past moments, most of the managers then in office ultimately conclude their careers with losing records. Of the 542 men who managed major-league teams from 1876 through 1990, only 176 (32%) had winning records (as of 1990). Yet of the managers in office for their team's first game of the 1907 season, a majority went on to accumulate winning records. The same was true for 1917, 1937, 1957, 1967, and 1977, though not for 1927 and 1947. (All statistics compiled laboriously from Wolff 1990.) Although only 32% of all managers had

winning records, it may well be that most major-league games were managed by that minority of winners. In that case, if we select a manager at random, we are very likely to have chosen a losing one. Nevertheless, if we select a moment of baseball history at random, it is more likely than not that most managers then in office were winners.

On the other hand, it may well be not only that most student organizations ever registered remain small throughout their history, but also that at most moments, most of the student groups then extant remain small throughout their history. In that case, we would (in the absence of any further relevant information) be justified in believing that probably, most current groups will always be small.

Is an analogous pessimistic induction warranted regarding the scientific theories currently receiving wide acceptance? The evidence would need to consist not merely of a few spectacular examples of long-held but false theories. That most of the theories that have ever been accepted were false is inevitably more plausible than the needed premise: that at most past moments, most of the theories then accepted were false.

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