JAN FORUM

Your views and letters

In response to: Paley J., Cheyne H., Dalgleish L., Duncan E. & Niven C. (2007) Nursing's ways of knowing and the dual process theories of cognition. *Journal of Advanced Nursing* 60(6), 692–701.

Evidence for and evidence against

In a recent paper in this journal, Paley *et al.* (2007) attempted to refute a point made by Dawn Freshwater and myself in our book *Deconstructing Evidence-Based Practice* that EBP 'appeals to an absence of evidence' (Freshwater & Rolfe 2004, p. 38). Paley and colleagues claimed that:

> Freshwater and Rolfe, however, translate *evidence against* the null hypothesis into *lack of evidence for it*; and it is this translation which is offered in support of their claim that, at the centre of EBP, there is no evidence at all. This is a startling non-sequitur. (Paley *et al.* 2007, p. 697, their emphasis)

This would indeed have been a startling non-sequitur if that is what we had said. In fact, we said the reverse:

> The evidence *for* a particular practice is actually a *lack* of evidence *against* it. When the postpositivists claim to have proved that a particular practice is effective, they have, in truth, merely failed to prove that it is ineffective. (Freshwater & Rolfe 2004, p. 38)

Unsurprisingly, given his misrepresentation of our argument, Paley rather misses the point that we were trying to make, which I will restate here.

Evidence-based practice is usually represented as practice based on 'best evidence' that something is the case, for example that a particular treatment is the best available, or that a particular drug is the safest. However, it has been recognized at least since the time of Galileo that it is impossible to make any generalization of this kind by induction, since the next observation might offer contrary evidence. For example, we can never prove by induction that a particular drug is safe for all (or even most) people, since however many observations we make of its safe administration, it will only take one future case of adverse side effects to show that it is, in fact, harmful. The unfortunate example of Thalidomide illustrates this point very well: no side effects were observed until the pregnant users of this anti-emetic gave birth to disabled babies, at which point the formerly 'safe' drug was rapidly reassessed.

Karl Popper (1992) attempted to counter this so-called 'problem of induction' by suggesting that scientists do not, in fact, reason in this way, and offered in place of induction the method of 'hypothetico-deductivism'. Since general theories can never be proven, the project of science should be to attempt to *disprove* them: the longer that a theory resists being disproved, the more robust it is considered to be. However, as I stated above, it is never possible to say with certainty that a theory is finally proven, since it is always open to being disproved at the next attempt. This is, of course, very different from the claim made by Paley that we were advocating a search for evidence *against* the null hypothesis. On the contrary, our point is that (according to Popper) science proceeds by attempting to find evidence *for* the null hypothesis, and that it is the *failure* to come up with such evidence that constitutes the absence or lack which we claim is at the heart of evidence-based practice.

Let us return to the above example of testing a drug for safety. For Popper, the scientific aim in testing for harmful side effects is not to show that the drug is generally safe (which, as we have seen, is impossible), but to attempt (and hopefully fail) to show that it is harmful. The drug should therefore be subjected to tests, which do their utmost to elicit harmful side effects under as many conditions as possible. The longer that the drug fails to deliver any side effects, the more confidence we can have in its overall safety. It was in this context that we stated in our book that any claim to have produced evidence for the safety of the drug is actually based on a *lack of evidence* that it is harmful. Similarly, the logic of hypothetico-deductivism suggests that rather than test a treatment for its effectiveness, we should subject it to our best attempts at showing that it is ineffective. For Popper, the treatment that most successfully survives our tests to discredit it (in what he likened to a Darwinian 'survival of the fittest') is the one that we should adopt.

It is in this sense, then, that we claimed in our book that evidence-based practice appeals to an absence of evidence, and (perhaps controversially) that if research is conducted according to the logic of Popper's method of hypothetico-deductivism, then evidence-based treatments are actually predicated on the *failure* to find evidence that confirms the null hypothesis that those treatments are ineffective. This was, however, only one of many arguments presented in our book against the logic of evidence-based practice, and arguably not the most compelling. Clearly,

Paley and colleagues disagree with this position, but I am disappointed that they should attempt to discredit our argument by falsely representing it.

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Popper K. (1992) *The Logic of Scientific Discovery*, Routledge, London.