

BACK TO NATURE REVISITED

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“Contempt for simple observation is a lethal trait in any science”
(Niko Tinbergen, 1963)

The psychology of the 1960s was dominated by conditioning theory. Proponents, such as Burrhus Skinner believed that the basic unit of behaviour was the connection between stimulus and response and that these connections were influenced by reward and punishment (Skinner, 1936). Skinnerians further held that this was the basis of all learning and that as this was a universal, the phenomenon could be studied in any convenient species, including rats or pigeons (Skinner, 1938). Skinner boxes were small and relatively featureless, designed to reduce ‘extraneous behaviour’ such as exploration. The intention being to encourage animals to focus their attention on levers, that in their simplest form, would shape behaviour by delivering a reward. The Skinnerian approach thus not only ignored animals’ natural behavioural repertoire, except where this interrupted their studies (e.g. Breland & Breland, 1961) but considered this to be a virtue.

It was against this background that Niko Tinbergen published his seminal 1963 paper “On aims and methods of ethology”, where he left no doubt that the Skinnerian approach was antithetical to the aims of ethology. The pioneering ethologists of the day were field naturalists or zoologists who ‘were personally acquainted with an overwhelming variety of puzzling behaviour patterns which were simply not mentioned in behaviour textbooks, let alone analysed or interpreted.’ (Tinbergen, 1963, p 411). By contrast, the Behaviourism they encountered tended to “concentrate on a few phenomena observed in a handful of species which were kept in impoverished environments, to formulate theories claimed to be general”. Blurton-Jones (1975) similarly noted “the lateral thinking inductive approach of ethology may be contrasted with the deductive approach of psychology and its disdain for facts for their own sake” (page 72).”

Niko Tinbergen’s call was thus for a ‘return to Nature’, where “watching and wondering”, that is, observation and knowledge of natural behaviour, were to be placed at the very heart of the behavioural sciences. The late Bill Charlesworth captured the spirit of Tinbergen’s meaning when he wrote “One must first know what the organism was like on an everyday basis before intervening with an experiment or questionnaire”. (Charlesworth, 2001).

Much has apparently changed in the near 60 years since “On aims and methods of ethology” (Tinbergen, 1963) was published. Behaviourism is no longer the dominant philosophy and many university departments are no longer even equipped to study it in the way Skinner did (Hendrie, 2010). In its wake came ‘Cognitive Psychology’ (Neisser, 1967) and the rejection of Skinner’s black-box’ approach, replacing this with a focus on the brain as an information processor. Evolutionary Psychology (Cosmides & Tooby, 1987; Barkow et al, 1992) ‘a new paradigm for Psychological Science’ (Buss, 1995) grew out of that, seeking evolutionary explanations for the modularity inferred by the ‘cognitive revolution’.

Whilst Evolutionary Psychology (EP) was founded on the aspiration that it would be a unifying force in a discipline that was otherwise in ‘conceptual disarray’ (Buss, 1995), this has turned out not to be the case. At least not as yet. The number of academics who identify as EP-ists has undoubtedly increased (Kruger et al, 2022), but in addition to the lack of general acceptance of evolution amongst the public in the United States, the field has also faced criticism from within the academic community. This has not been so much for the general approach, which has been praised as being ‘broad and laudible’ (de Waal, 2002), but for its application (e.g. Grossi, 2014; Grossi et al, 2014, Nash, 2014; Parameswaran, 2014; Smith, 2020).

EP’s origins are in the biological sciences; however, the great majority of present-day adherents are psychologists (Kruger et al, 2022) and this has influenced the research questions asked and the approach used to address them. Buss’s bestselling textbook ‘Evolutionary Psychology: The new science of the mind’ (Buss, 2019) for example, gives over more than 100 pages (> 20% of the book) to topics relating to sexual behaviour, whilst only around 5 pages are used to describe Darwin and the Theory of Evolution. The result is that EP-ists’ adaptationist thinking can be loose, equating the presence of traits with ‘advantage’ and unnecessarily invoking the theoretical existence of corresponding specialised structures in the brain (e.g. Grossi, 2014).

There is also the potential confound of what is supposed as ‘adaptation’ may in fact be the product of the cultural influences of Judeo-Christian based empires that dominated much of the world at one time or another (Henrich et al, 2010; Nash, 2014). Most EP-ists are also based in the Latin West and a good proportion of EP studies are based on data collected from undergraduate students in the universities where they work (e.g. Altarriba & Avery, 2021; Apostolou et al, 2021; Burtäverde et al, 2021; Garza et al, 2021; Kaighobadi et al, 2021; Kennair et al, 2021; Thiebaut et al, 2021; Cao et al, 2022; Krems et al, 2022, Nebl & Gordon, 2022). EP studies are therefore often based on a WEIRD (Western, Educated, Industrialized, Rich, Democratic) population, that is not representative of the broader population (Apicella et al, 2020) and where a randomly selected American undergraduate is more than 4,000 times more likely to be a research participant than a randomly selected person from outside of the Latin West. (Henrich et al, 2010). EP has thus meandered into the same cul-de-sac as Behaviourism a generation earlier, and has been attempting to infer the existence of generalised adaptations based on studies of samples that are not representative of the wider population.

From an ethological perspective viewing human behaviour through an ‘evolutionary’ lens provides only part of the information that is needed to gain an understanding of the phenomenon under investigation. Tinbergen raised four questions to do with causation, survival value, ontogeny and evolution (Tinbergen, 1963). EP’s main focus is on ‘evolution’ and so addresses only one of these, which severely restricts its explanatory power.

The ethological approach is to first focus on observation and description of behaviour before considering other issues. To give an example of this approach in the context of psychology and panic disorder in particular. Panic attacks are associated with ‘brief moments of immobility’ (Klein, 1981). Reduced movement is seen in patients with panic disorder when shown panicogenic stimuli (Lopes, 2009) Freezing and panic-like symptoms are noted in healthy volunteers in response to brief inhalation of 20% CO₂ inhalation (Schmidt et al, 2008) or infusions of CCK-4 (Bradwejn et al, 1994).

Immobility/ freezing is a well-documented defensive reaction in a wide range of species (Blanchard et al, 1986; Eibl-Eibesfeldt, 1961; Eilam et al, 1999; Eilam 2005; Gray, 1971; Kalin, 1993; Kalin et al, 1998; Pickles et al, 2012,) and so appears to be phylogenetically well preserved. Defensive behaviour is itself organised according to the distance between the threat (“predator”) and the threatened (“prey”) (Gallup, 1974; Ratner, 1977). Briefly, this distance-dependent-defence-hierarchy comprises of (i) constant vigilance when no predators are in sight, (ii) maximisation of distance or removal from visual contact when a predator is sighted, (iii) escape attempts which may include protean behaviour in the event of a predator rapidly approaching, (iv) defensive aggression using whatever natural weaponry the prey species possess when predator/prey distance is reduced to zero, and finally (v) tonic immobility/death feigning (see Hendrie et al, 1996 for review).

Freeze responses associated with panic attacks may therefore be related to a “stop, look, and listen” response (Bracha et al, 2004, Gray, 1971, 1988) seen near the beginning of the distance-dependent-defence-hierarchy or tonic immobility (‘death feigning’) which would come at the end of the sequence. Further studies are required to determine which.

The EP approach is to give thought to the various subtypes of fear discussed in the mainly intuition-based DSM (APA, 1980) and then try to relate these to the threats they are assumed to have evolved to protect against (e.g. Nesse, 1990). For example, ‘small animal phobia’ is imagined to be derived from an adaptive response to ‘dangerous small animals’. Similarly, panic is considered to be a response to “imminent attack by predator or human” (Nesse 1990, p271). This same author describes in this and an earlier paper how panic is associated with physiological changes such as increased heart rate/breathing and increased cognitive activity that is ‘focused on planning escape’ (Nesse, 1987, p 77S). Panic is therefore seen in the context of the ‘fight or flight’ response (Cannon, 1927) and viewed as ‘an adaptive defense that facilitates escape from mortal danger’ (Nesse, 1987, p 74S). The EP approach is therefore a tautological one, that first puts behaviour into arbitrary groupings, then seeks to ascribe function based on those unfounded categorisations, instead of developing ideas about possible functions based on observation of natural behaviour.

This ‘story-led’ approach is also seen in EP theories of depression, such as in the ‘Environment of Evolutionary Adaptedness’ (EEA) hypothesis (Bowlby, 1969). This is essentially a ‘Garden of Eden’ hypothesis that holds that depression is a disease of modernity (Hidaka, (2012) caused by the mismatch between the EEA and modern world (See Bennett, 2018 for review). The ‘Social Navigation Hypothesis’ (Watson & Andrews, 2002) attempts to account for rumination, whilst Raisin & Miller (2013) consider social withdrawal to be a pathogen avoidance mechanism.

The ethological ‘behavioural description first’ approach makes it clear however that the behaviours associated with depression, such as hunched posture and avoidance of eye contact, are defensive in character. Suppression of appetites for food and sex serves to reduce competition, as does social withdrawal. Sleep disturbance means that depressives are awake at times when others are asleep. The involvement of appetitive behaviour and alterations in sleep/wake cycles strongly implicates mediation by events in and/or around the Third ventricle, although this has not as yet been examined experimentally (Hendrie & Pickles, 2010).

The differences between the ethological and EP approaches may seem trivial and unimportant to some, but the potential to test by experimentation is critical (Popper,1963). Poor science is time-wasting and can be costly, as Big Pharma found before it abandoned attempts to develop a third generation of monoamine theory-based antidepressants in the early to mid-2000s (Hendrie & Pickles, 2013). Comparison of ethological and EP methodologies therefore serves to demonstrate the key importance of the ‘observation and behavioural description first’ approach.

Tinbergen’s call in 1963 was for a ‘return to Nature’ because the Psychology of the time was dominated by Behaviourism, and this tended to “concentrate on a few phenomena observed in a handful of species which were kept in impoverished environments, to formulate theories claimed to be general” (Tinbergen, 1963, p 411). At the time of writing, towards the end of the first

quarter of C21st, the same issues still exist with EP, except that rats and pigeons have largely been replaced by WEIRD students, and Skinner boxes with questionnaires and vignettes. Dobzhansky (1973) wrote that “nothing in biology makes sense except in the light of evolution” and this is absolutely the case. The same sort of statement can also be made however about EP and the full zoological description of our species, that we do not currently have.

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