

## Ad Hoc Analysis <sup>[1]</sup>

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An ad hoc analysis is an extra type of hypothesis added to the results of an experiment to try to explain away contrary evidence.

The scientific method dictates that, if a hypothesis is rejected, then that is final. The research needs to be redesigned or refined before the hypothesis can be tested again.

Amongst pseudo-scientists, an ad hoc hypothesis is often appended, in an attempt to justify why the expected results were not obtained.

An often quoted example of an ad hoc analysis is of a paranormal investigator investigating psychic waves, under scientific conditions. Upon finding that the experiment did not give positive results, they blame the negative brain waves given out by others.

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This is simply trying to deflect criticism and failure by throwing out other, completely random reasons. This ad hoc analysis would need the brain waves of the onlookers to be also tested and eliminated, moving the goalpost and creating a fallacy.

The idea of biorhythms, where the body and mind are affected by deep and regular cycles unrelated to biological circadian rhythms, has long been viewed with skepticism. Every time that scientific research debunks the theory, the adherents move the goal posts, inventing some other underlying reason to explain the results.

Often, astrologers presented with contrary evidence will blame the results upon some 'unknown' astrological phenomenon. This, of course, is impossible to prove and so the ad hoc analysis conveniently removes the pseudo-science from the debate.

The insanely stupid Water4Gas scam works along the same principles – when researchers pointed out that the whole idea revolves around the principle of perpetual motion, they

invented another ad hoc hypothesis to explain where the 'money saving' energy came from.

Ad hoc analysis is not always a bad thing, and can often be part of the process of refining research.

Imagine, for example, that a research group was conducting an experiment into water turbulence, but kept receiving strange results, disproving their hypothesis. Whilst attempting to eliminate any potential confounding variables, they discover that the air conditioning unit is faulty, transmitting vibrations through the lab. This is switched off when the experiment is running and they retest the hypothesis.

This is part of the normal scientific process, and is part of refining the research design rather than trying to move the goalposts.

Ad hoc analysis is only a problem when a non-testable ad hoc hypothesis is added to the results to justify failure and deflect criticisms.

The air conditioning unit hypothesis can be tested very easily, simply by switching it off, and was a result of experimental flaw. Negative brainwaves cannot be easily tested, and therefore the deflection causes a fallacy.

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