A valid argument is more than just an opinion!

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For many decades social sciences have been captivated by the statistical method. In itself there's nothing wrong with this. However, there's a serious side effect of a strong dependency on surveys, likert-scales and normal distributions: the argument is mainly seen as opinion and therefore hardly scientific. However, the science from which the statistical (quantitative) method is derived - mathematics - is based entirely on the argument. What's going on?

An example. Psychology professor Angela Duckworth conducts research into talent and examines the hypothesis that everyone within normal physical, cognitive and neurological boundaries is capable of becoming a high achiever. She states that the "grit" factor (motivation and lots of practice) always determines talent. The professor verified her hypothesis by interviewing a considerable number of top talents. It appears that they have all practiced a lot, especially under initial external motivation. If x, then y. Even Mozart "fits" in the scheme: before his father showed the prodigy to the world, he had had dozens of hours of practice. The statistical analyses have been carried out error-free, and for good reason the results have been placed in highly rated journals.

Arguing can always be traced back to four derivations, two correct ones, and two incorrect ones. The derivation used in the talent study is the modus ponens: x, then y, (verification). But x, then y does not automatically mean y, then x: If we see an exceptionally skilled person, he will have practiced a lot. After all, it is also possible that the skill has emerged without considerable effort, that it is in the genes, or that someone has been genetically manipulated, or came from another planet. This incorrect derivation is called "affirming the consequence". This fallacy is often implicitly present in statistical research. Sometimes in their discussion section scientists mention that correlation and causation aren't the same: an alternative explanation for y can not be excluded.

A modus ponens can be verified: an extreme skill level always follows a lot of practice. A correct derivation that often remains out of sight in the statistical method is the modus tollens: x -> y; there is no y, so no x. Finding a very ambitious parent/teacher who is training a "normal" child unsuccessfully but methodically well on the piano, falsifies this hypothesis. A high skill level without much practice also falsifies this theory. This isn't an opinion; it's a logical fact! (Idiot) savants and prodigies who demonstrate exceptional skills on YouTube at a very high level of achievement, falsify Duckworth's theory. Their skills (y) do not stem from exercising and motivation (x). Two fallacies are made; x -> y is equal to y -> x (affirming the consequence) and the ignorance of the modus tollens. No matter how hard we try, we cannot teach a mouse to roar, just as we cannot convert a tiger to vegetarianism! But because of the low status of the non-statistical method, social scientists produce journals full of well-executed quantitative research in which arguments and more probable alternative hypotheses are often wrongly dismissed as "opinions".

The Wason task illustrates specific shortages in human argumentation. Subjects receive 4 cards: "A", "4", "C" and "5". The rule is: if there's a vowel on one side of the card, there's an even number on the other side. Question: Which card (s) should you turn anyway in order to check the rule? Card "A" must be reversed. Almost everyone succeeds (ponens mode). Card "4" (x, then y isn't equal to y, then x) isn't about the rule. More than half of people turn this card around (error "affirming the consequence"). Also card "C" doesn't need to be reversed (error "denying the antecedent"). The card with number 5 must be reversed! Only 5% of people succeed! It concerns the modus tollens: no y (even number), so no x (vowel). If there's a vowel on the back of the 5, the rule is falsified. Both wrongly "affirming the consequence", and not applying the modus tollens are erroneous present in the talent study. A good argument is not just an opinion!