I think we are causing (yes, CAUSING) enormous confusion in the minds of consumers (as well as in the minds of our students, and even ourselves) by using the terms “independent” and “dependent” as loosely as we do.

In my research methodology classes we critique lots of research articles. Most educational researchers want desperately to establish cause. (Of course; we are a profession. We intervene, and hope to make an impact.) Most of these studies are correlational or causal comparative (ex post facto). Many of the authors know that they are supposed to be careful in using blatantly denotive causal language, or that they must qualify their causal inferences, suggestions and conclusions. But there is a rich array of terminology with varying degrees of subtle causal connotations to choose from.

I tell my students to answer the questions, “What do the authors want us to believe?” (Not “what do the authors conclude,” which is often not very clear.) “What data address these (often causal) arguments/inferences/suggestions?” And, “Based on these data, how strong is the case for a causal argument.”

We find that what the authors can support, and what they want us to believe are often miles apart. Causal arguments usually permeate the introduction and discussion sections, even to the point of making recommendations which necessarily assume causation. Don’t get me wrong. I’m not against making causal arguments. In fact, we must try to build causal cases. But we also must be honest about the strength of our causal cases. Many authors want us to believe that their data support a very strong case for a causal argument, when in fact, the strength of their case must be characterized as very weak.

This problem is exacerbated by the statistical term “explain” (which has a statistical meaning about common variance, but Webster meanings which include causation — to give reasons for). And it is further compounded by many researchers using a prediction model to imply a causal relationship. The regression model seems directional (even though prediction in the opposite direction is equally viable). It’s not uncommon for researchers with no particular interest in prediction to use a regression model and then suggest causal possibilities, or probabilities.

I don’t have a solution. A few years ago I suggested to SPSS [Statistical Program for Social Sciences] that they replace the words “independent” and “dependent” in their printouts with “predictor” and “criterion.” But this isn’t right, either. We don’t always want to predict, and we do often want to suggest possible partial causation. Burke Johnson suggested the possibility of “exogenous” and “endogenous,” which are terms used in structural modeling. I’d be satisfied if researchers would routinely and clearly remind readers that their causal argument is just one possibility, and that, at best, it may be a partial cause (often explaining as little as 5% of “dependent” variable variance). We’re all allowed to dream.
manipulate dosage and see that IT accounts for variance on the criterion (days to recovery, for example) ... i have no problem using independent variable for the X variable (though joe ward would prefer that we designate X as the outcome ...) and then call the Y variable the dependent variable after all, experimental designs and ANOVA ... are special cases of broader based regression ... and, in regression, it is the accounting for variance (r squared) on the outcome that is the important thing we have to be careful however to NOT think (necessarily) that the independent variable causes the outcome variable)

At 02:34 PM 11/16/00 -0600, you wrote:
> > Hi Folks:
> > For several years in my research methods classes, I have reserved the term
> > independent variable for those variables that are specifically experimentally
> > manipulated. I realize that many prominent texts also use this term to
> > describe a variable "thought to cause" a change in the dependent variable.
> > My objections to this use stems from the fact that many students come to
> > believe that variables like gender "cause" certain outcomes. This seems
> > particularly true when ANOVA designs are used in which such variables are
> > designated "independent" variables. It is particularly frustrating given
> > that packages like SPSS refer to independent variables in regression models,
> > when I see these as predictors. I try to get students to use terms like
> > "subject variable" to refer to characteristics such as SES, Gender, and
> > Ethnicity, or "classification variable" to describe environmental variables
> > such as rural or urban school setting. But I am growing weary, and some of
> > my colleagues have dismissed my exactitude in terminology as trivial. So I
> > ask listserv members, I am fighting a battle worth winning, has it already
> > been lost, and are the consequences indeed trivial. I recently joined the
> > listserv and this is my first post, so I apologize if this issue has been
> > batted around in the past. Regards, Tom. >

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