

### 3.5: The Role of Variables - Predictors and Outcomes

Normally, when we do some research, we end up with lots of different variables. Then, when we analyse our data, we usually try to explain some of the variables in terms of some of the other variables. It's important to keep the two roles “thing doing the explaining” and “thing being explained” distinct. So let's be clear about this now. First, we might as well get used to the idea of using mathematical symbols to describe variables, since it's going to happen over and over again. Let's denote the “to be explained” variable as  $Y$  and denote the variables “doing the explaining” as  $X_1, X_2$  and so on.

When we are doing an analysis, we have different names for  $X$  and  $Y$  since they play different roles in the analysis. The classical names for these roles are **independent variable** (IV) and **dependent variable** (DV). The IV is the variable that you use to do the explaining (i.e.,  $X$ ) and the DV is the variable being explained (i.e.,  $Y$ ). The logic behind these names goes like this: if there really is a relationship between  $X$  and  $Y$  then we can say that  $X$  depends on  $Y$ , and if we have designed our study “properly” then  $Y$  isn't dependent on anything else.

I personally find those names unintuitive. They're hard to remember and they're highly misleading because (a) the IV is never actually “independent of everything else”, and (b) if there's no relationship then the DV doesn't actually depend on the IV.

A lot of statistical books still use these terms however, so it's still good to know them. The terms that I'll use in this book are **predictors** and **outcomes**. The idea here is that what you're trying to do is use  $X$  (the predictors) to make guesses about  $Y$  (the outcomes). Navarro and Foxcroft (2022)<sup>[1]</sup> provided a summary of the differences which can be found in Table 3.5.1.

**Table 3.5.1.** Variable distinctions

Role of the variable	Classical name	Modern name
“to be explained”	dependent variable (DV)	outcome
“to do the explaining”	independent variable (IV)	predictor

#### Chapter attribution

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1. Navarro, D. J., & Foxcroft, D. R. (2022). *Learning statistics with jamovi: A tutorial for psychology students and other beginners* (Version 0.75). <https://doi.org/10.24384/hgc3-7p15> ↵

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