

How do sociologists use t-tests?

The t-test is one of many statistical techniques available to sociologists. We discussed how the t-test is appropriate for comparing two groups' means of an interval or ratio variable. We also discussed how the t-test tells us whether the differences we observed are *significant* - that is, not by chance.

So how do sociologists use t-tests?

Do men overcompensate when their masculinity is threatened?

In our culture, there is an intuitive understanding that threatening a man's masculinity may cause him to react in a way to show others that he is actually masculine. Willer and colleagues (Willer, Rogalin, Conlon, & Wojnowicz, 2013) sought to test whether threatening a man's masculinity would cause him to overcompensate ("the overcompensation hypothesis"). In an experiment, they assigned male participants randomly to two conditions: one group was told they had scored in the "average male range" on a gender identity survey, while the other group was told they had scored in the "average female range." Participants were randomly assigned to these groups, so the feedback they were given was *not* actually based on their answers to the survey. They then asked each respondent's opinion on a host of "masculine" issues, including their support for the Iraq War on a scale from 1 to 7.

What is the independent variable? Is it nominal, ordinal, interval, or ratio?

What is the dependent variable? Is it nominal, ordinal, interval, or ratio?

Based on your answers, is a t-test appropriate?

Willer and colleagues hypothesized that masculinity threat (the independent variable, nominal - specifically binary or dummy) would increase support for the Iraq War (the dependent variable, interval). Because they were looking at the relationship between a binary and interval variable, they used a t-test to determine if average support for the Iraq War was statistically higher for those who had received feedback that they were "feminine." Their results are shown in table 1.

Table 1. Effect of gender identity feedback on men's support for the Iraq War.

	Masculinity threatened	Masculinity not threatened	t-statistic
<i>Mean support for the Iraq War</i>	3.64 (1.85)	2.65 (1.52)	2.06*

Note: Standard errors in parentheses. * = $p < 0.05$. N = 51.

What is the null hypothesis for this test?

What is the alternative hypothesis for this test?

How would you interpret this t-statistic?

Mean support for the Iraq War was higher for those who had their masculinity threatened compared with those who did not (a difference of $3.64 - 2.65 = 0.99$). But is the difference statistically significant or by chance? Willer and colleagues calculated a t-statistic of 2.06. The null hypothesis for this test is that there is no difference in support for the Iraq War between these two groups. The alternative hypothesis is that support for the Iraq War is higher among those who had their masculinity threatened. They used a two-tailed test (to be more conservative) and found a significant difference, meaning they could reject the null hypothesis. Men whose masculinity had been threatened had significantly greater support for the Iraq War. This provided evidence of their overcompensation hypothesis.

What limitations does Willer et al's data or data analysis have?

But what if this is not about masculinity per se, but about threat to gender identity generally? What if, for instance, both men *and* women react in the same way to learning that they have "atypical" gender identities? Willer and colleagues considered this argument beforehand, and thus ran the same experiment with women too. There was no significant difference in support for the Iraq War (or any of the other dependent variables they measured) between female participants who were told they scored in the feminine range and those who were told they score in the masculine range. The authors take this to mean that it is threat to *masculinity*, not gender identity broadly, that caused the observed effect.

References

Willer, R., Rogalin, C. L., Conlon, B., & Wojnowicz, M. T. (2013). Overdoing Gender: A Test of the Masculine Overcompensation Thesis. *The American Journal of Sociology*, 118(4), 980–1022.