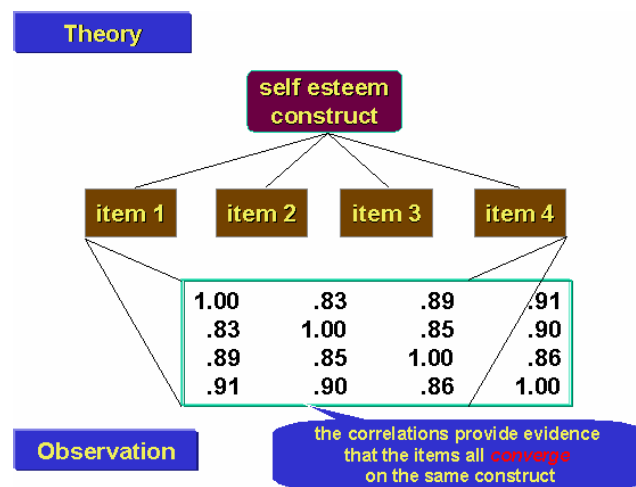


CONVERGENT AND DISCRIMINANT VALIDITY

In **convergent validity**, we examine the degree to which the operationalization is similar to (converges on) other operationalizations that it theoretically should be similar to. For instance, to show the convergent validity of a Head Start program, we might gather evidence that shows that the program is similar to other Head Start programs. Or, to show the convergent validity of a test of arithmetic skills, we might correlate the scores on our test with scores on other tests that purport to measure basic math ability, where high correlations would be evidence of convergent validity.

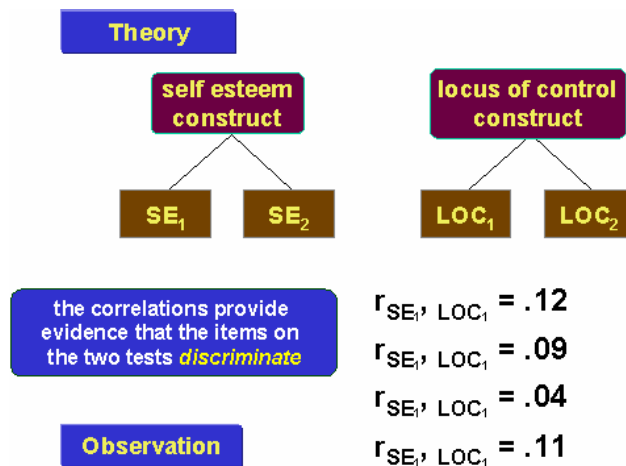
To establish convergent validity, we need to show that measures that should be related are in reality related. In the figure below, we see four measures (each is an item on a scale) that all purport to reflect the construct of self-esteem. For instance, Item 1 might be the statement "I feel good about myself" rated using a 1-to-5 Likert-type response format. We theorize that all four items reflect the idea of self-esteem (this is why the top part of the figure has been labelled Theory). On the bottom part of the figure (Observation) we see the intercorrelations of the four scale items. This might be based on giving our scale out to a sample of respondents. It should readily be seen that the item intercorrelations for all item pairings are very high (remember that correlations range from -1.00 to +1.00). This provides evidence that our theory that all four items are related to the same construct is supported.



Notice, however, that while the high intercorrelations demonstrate the four items are probably related to the same construct, that doesn't automatically mean that the construct is self-esteem. Maybe there's some other construct that all four items are related to (more about this later). But, at the very least, we can assume from the pattern of correlations that the four items are converging on the same thing, whatever we might call it.

In **discriminant validity**, we examine the degree to which the operationalization is not similar to (diverges from) other operationalizations that it theoretically should be not be similar to. For instance, to show the discriminant validity of a Head Start program, we might gather evidence that shows that the program is *not* similar to other early childhood programs that don't label themselves as Head Start programs. Or, to show the discriminant validity of a test of arithmetic skills, we might correlate the scores on our test with scores on tests that of verbal ability, where low correlations would be evidence of discriminant validity.

To establish discriminant validity, you need to show that measures that should not be related are in reality not related. In the figure below, we again see four measures (each is an item on a scale). Here, however, two of the items are thought to reflect the construct of self-esteem while the other two are thought to reflect locus of control. The top part of the figure shows our theoretically expected relationships among the four items. If we have discriminant validity, the relationship between measures from different constructs should be very low (again, we don't know how low "low" should be, but we'll deal with that later). There are four correlations between measures that reflect different constructs, and these are shown on the bottom of the figure (Observation). You should see immediately that these four cross-construct correlations are very low (i.e., near zero) and certainly much lower than the convergent correlations in the previous figure.



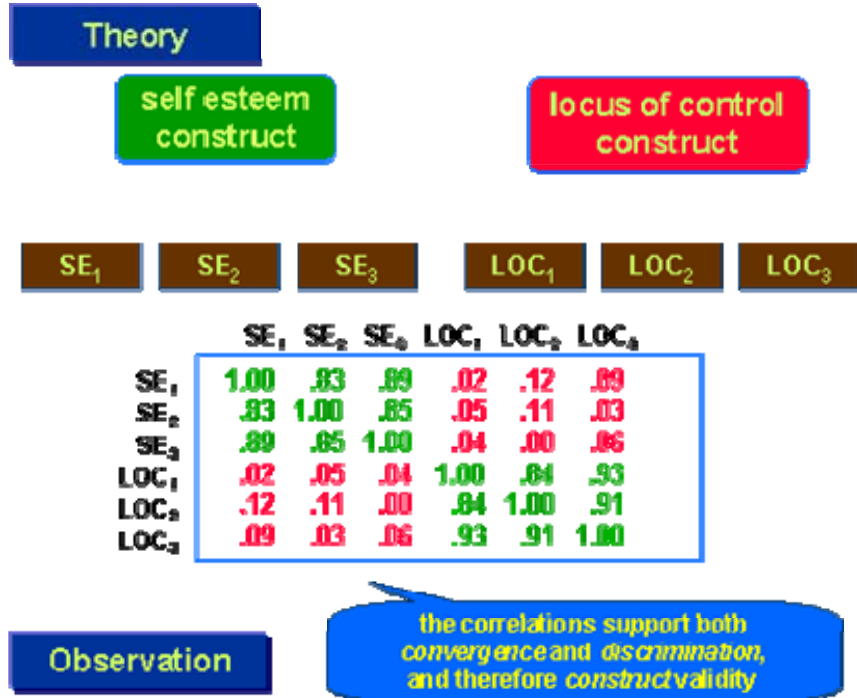
As above, just because we've provided evidence that the two sets of two measures each seem to be related to different constructs (because their intercorrelations are so low) doesn't mean that the constructs they're related to are self-esteem and locus of control. But the correlations do provide evidence that the two sets of measures are discriminated from each other.

Putting It All Together

Okay, so where does this leave us? We've shown how we go about providing evidence for convergent and discriminant validity separately. But as we said at the outset, in order to argue for construct validity we really need to be able to show that both of these types of validity are supported. Given the above, we should be able to see that we could put both principles together into a single analysis to examine both at the same time. This is illustrated in the figure below.

The figure shows six measures, three that are theoretically related to the construct of self-esteem and three that are thought to be related to locus of control. The top part of the figure shows this theoretical arrangement. The bottom of the figure shows what a correlation matrix based on a pilot sample might show. To understand this table, we need to first be able to identify the convergent correlations and the discriminant ones. There are two sets or blocks of convergent coefficients (in red), one 3x3 block for the self-esteem intercorrelations and one 3x3 block for the locus of control correlations. There are also two 3x3 blocks of discriminant coefficients (shown in green), although if you're really sharp you'll recognize that they are the same values in mirror image (Do you know why? You might want to read up on correlations to refresh your memory).

How do we make sense of the patterns of correlations? Remember that it was said above that we don't have any firm rules for how high or low the correlations need to be to provide evidence for either type of validity. But we do know that the convergent correlations should always be higher than the discriminant ones. If we take a good look at the table, we will see that, in this example, the convergent correlations are always higher than the discriminant ones. We would conclude from this that the correlation matrix provides evidence for both convergent and discriminant validity, all in one analysis!



But while the pattern supports discriminant and convergent validity, does it show that the three self-esteem measures actually measure self-esteem or that the three loci of control measures actually measure locus of control? Of course, not! That would be much too easy.

So, what good is this analysis? It does show that, as we predicted, the three self-esteem measures seem to reflect the same construct (whatever that might be), the three locus of control measures also seem to reflect the same construct (again, whatever that is) and that the two sets of measures seem to be reflecting two different constructs (whatever they are). That's not bad for one simple analysis.