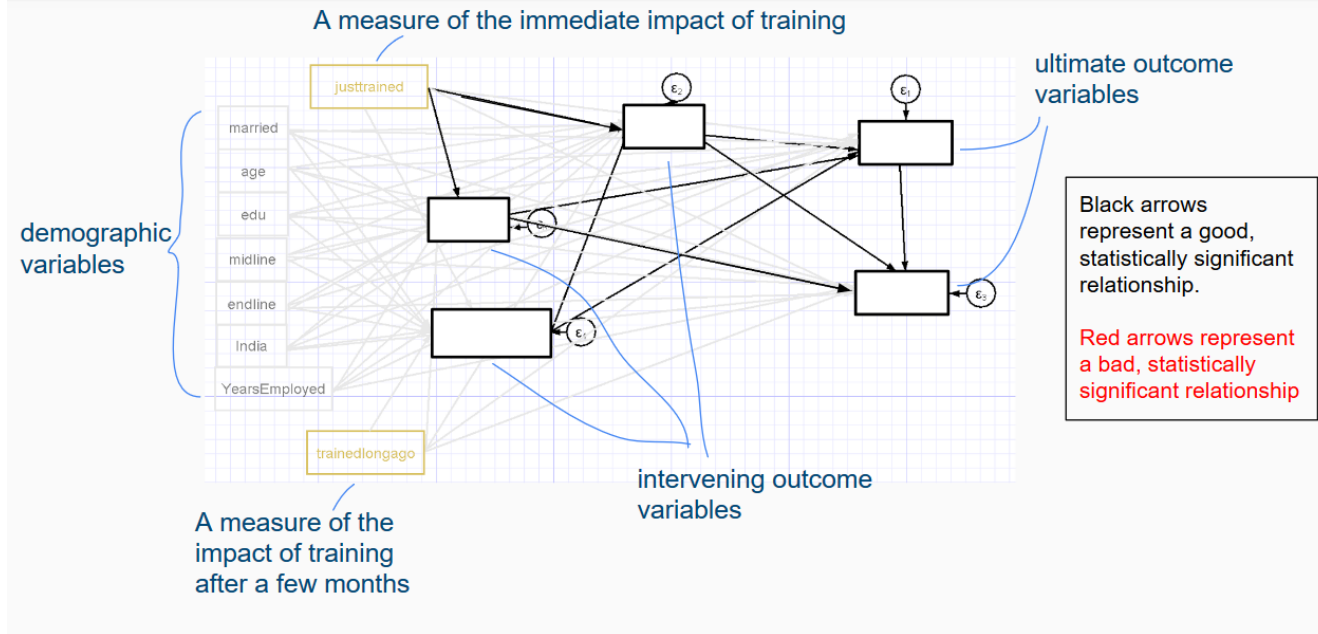


## Sample of a simultaneous equation model



### Interpreting the Structural Equation Model

The structural equation model visually represents the relationships between variables.

In standard analysis, we look at the impact of treatment on just one variable.

“Does training impact how often a worker is sick?”

In Simultaneous Equation Estimation, we measure the impact of multiple variables on one another as a system.

“Does training impact a worker’s knowledge of clean water? Does that in turn affect whether they boil their water? Does that knowledge and behavior impact how often they are sick?”

In this way, we measure the full impact of training through mediating variables.

This analysis also enables us to take a holistic look at what factors make training most effective. For example, we have found that confident workers experience greater gains from training.

The variables at the left in grey are standard exogenous demographic controls (age, education, marital status, country, years employed and time period of data collection).

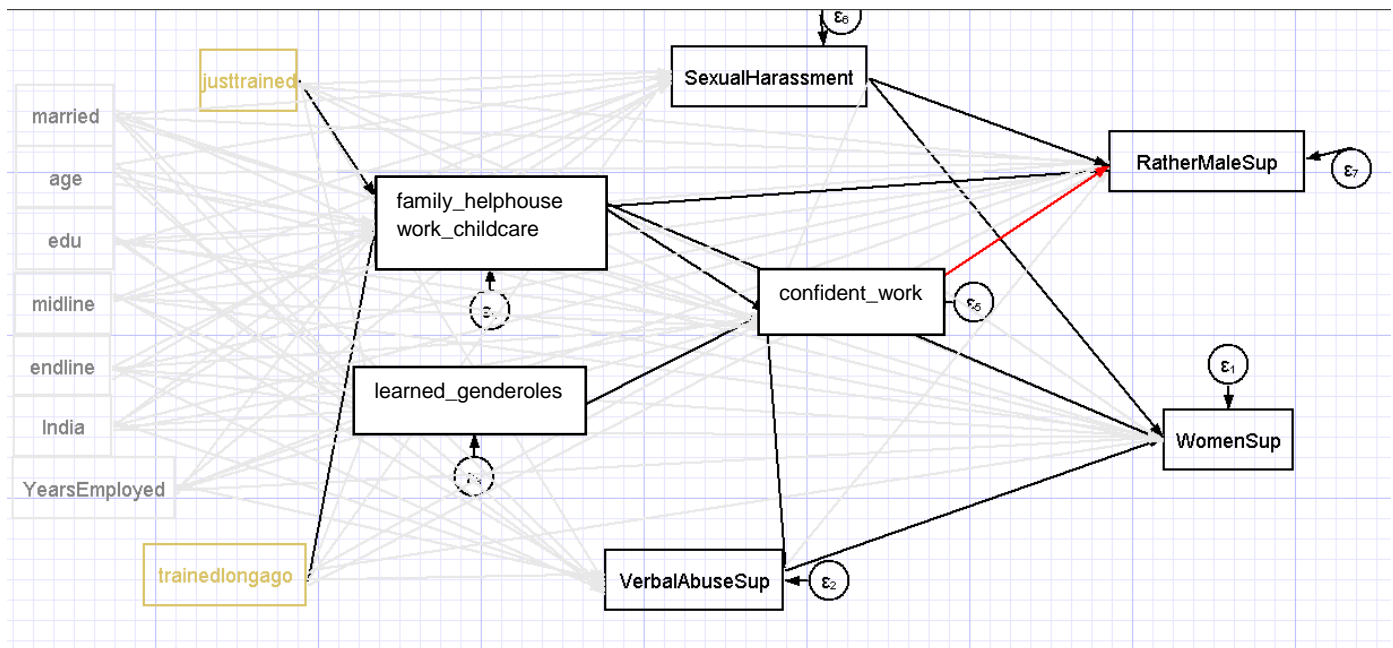
The gold variables are the training variables. Justtrained is a measure of the short-term impact of training (measured immediately after training), while trainedlongago measures the long-term impact of training (after several months). Trainedlongago helps us understand if there has been decay (the training is less effective with time) or curing (the training is more effective with time).

The variables in the middle of the ‘web’ are intervening variables- we are interested in the impact training has on them, but we also know that they impact other variables.

The variables on the far right are the ultimate outcome variables- those measures of training which we are most interested in.

All variables have been coded such that a higher number means a positive outcome and a lower number means a negative outcome. This means a positive regression coefficient is a ‘good’ outcome and a negative regression coefficient is a ‘bad’ outcome.

In the visual web, these relationships are represented by colored arrows. A black arrow represents a positive (good) and statistically significant relationship, while a red arrow represents a negative (bad) and significant relationship.



### Gender at Work

The above image depicts the treatment paths from the 100-hour Women in Factories Advanced Training, an intensive empowerment course for women.

Whether a worker understands that gender roles are learned has an impact on her confidence at work (confidence has been found to be a key variable in many aspects of training).

Less sexual harassment means a lower preference for male supervisors, and beliefs that women can be good supervisors.

These can also both be thought of as proxy measures for understanding gender in the workplaces. Women who experience less sexual harassment are more likely to be empowered to view other women as capable and effective supervisors.

Less verbal abuse means a worker is more confident at work and believes women can be good supervisors.

This is similar to the relationship between sexual harassment and empowerment. Workers who experience less verbal abuse are more likely to be empowered to view other women as capable and effective supervisors.

Training does not have much impact on a worker's understanding of gender socialization.

However, training does have a significant long and short-term impact on whether a worker's family helps her with childcare and housework.

Trainers from SWASTI observed that many women workers do not want to be supervisors, because they feel this is too much work in addition to their many duties at home.

Workers whose families help them with domestic duties have more time, and therefore more direct incentive to be supervisors.

When a woman's family helps her with housework and childcare, there is a direct and twofold impact on empowerment. She is more confident at work, and also more likely to view other women as capable and effective supervisors.

We start to see an interesting relationship here between being confident (unrelated to training) and *preferring* a male supervisor.

One theory is that some women who gain power are more likely to buy into the hierarchical structure of the factory (social psychologists refer to this phenomenon as 'Climbing and Kicking'). The empowerment aspect for them is therefore very individual and not related to overall gender empowerment.