Self-efficacy and structural barriers as mediators of energy efficiency behavioral change

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Purpose

* **A number of well established models employ the cognitive construct Self-Efficacy as an intermediary between knowledge and action.**

* **Schwarzer's Health Action Process Approach model is a version that has been broadly applied in the healthy behavior literature.**

HAPA

Here Self-efficacy is seen as acting both directly on Intention as well as on Planning
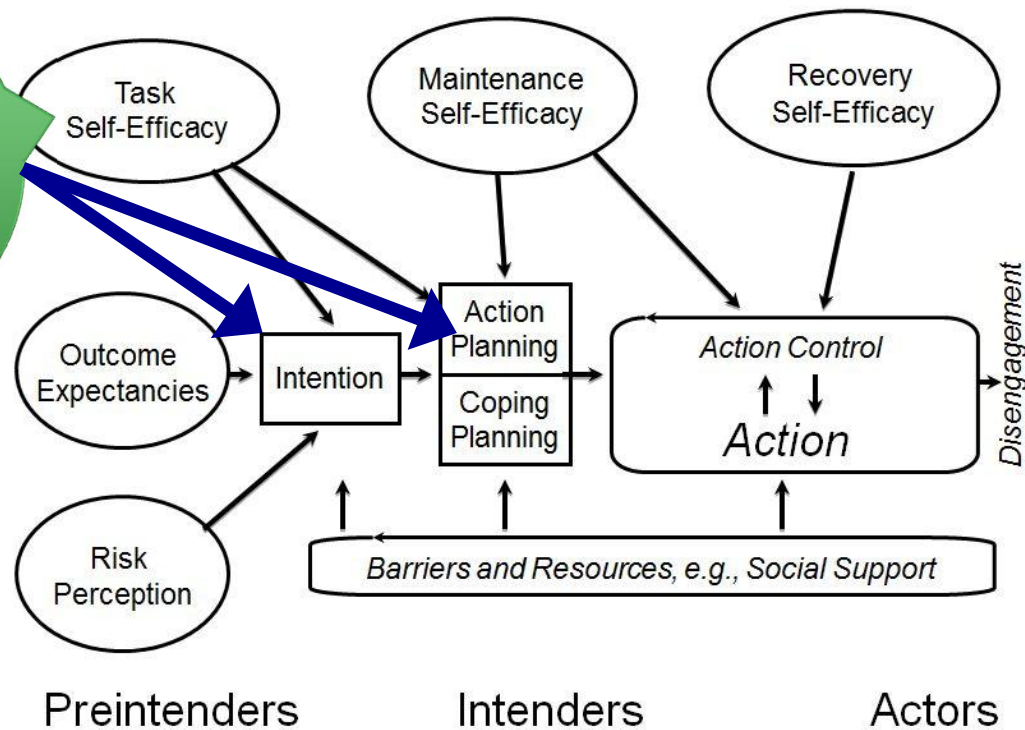
We had been working with Barriers

* We had been working with barriers to implementation of some of our programs
  * Interestingly when the group of learners was split into two groups – one to work on medical technical issues and one to work on barriers to implementaton
  * We received roughly twice the compliance from the medical technical group
  * It was as if the learners simply were uncomfortable in dealing with non-medical barriers

We decided to study the constructs more formally

* In a large group of learners we decided to assess the relationships among the three cognitive constructs:
    * Intent
    * Self-efficacy
    * Barriers to change

Method – Self-efficacy Scale

* **Method:** The measure of individual sense of self-efficacy was a four-item scale purpose built for CME. As considerable work has ben done in this area the wording borrows heavily from Wallston's and Schwarzer's scales.
* The four items were:
  * It is difficult for me to find effective solutions to the problems that come my way.
  * I succeed in the projects I undertake.
  * Typically, my plans don't work out well.
  * I am able to do things as well as most other people.

Barriers Scale

* The measure of barriers was a six-item scale that was also purpose built. As we have been studying this for some time we employed the scale we have used in the past.
    * The team is quick to adapt to new approaches.
    * This organization provides little support or encouragement for new approaches.
    * My peers like to use the approaches that have worked in the past.
    * The nurses and techs are eager to learn new methods.
    * Although I understand the latest data, my group prefers to wait to implement new approaches until all of the issues are fully explored.
    * While there are certainly guidelines available, I have a great deal of flexibility in the regimens I use.

Method

* Each of these measures has been confirmed for structure and together they provide indicators of five underlying variables – two self-efficacy variables and three barrier variables.

* In addition, a intent to implement measure was collected using a trade-off analysis, it was entered into the model as an estimate of relative importance.

* 242 respondents are in the dataset

Methods - Variables

* For the preliminary analysis we employed the derived variables, the factor scores, from these two sets of variables:
  * Self-efficacy related to personal change
  * Self-efficacy related to past results
  * Barriers related to organizational structural malleability
  * Barriers related to interpersonal inertia
 * Barriers related to interpersonal cohesion

Results

* **Results:** Preliminary analysis demonstrates a significant relationship the variables
* The overall model explains approximately 60% of the variance
* The univariate relationships between the two barriers constructs and intent appear significant.

Structural Malleability

Inertial

Cohesion

Change

Result

Intent
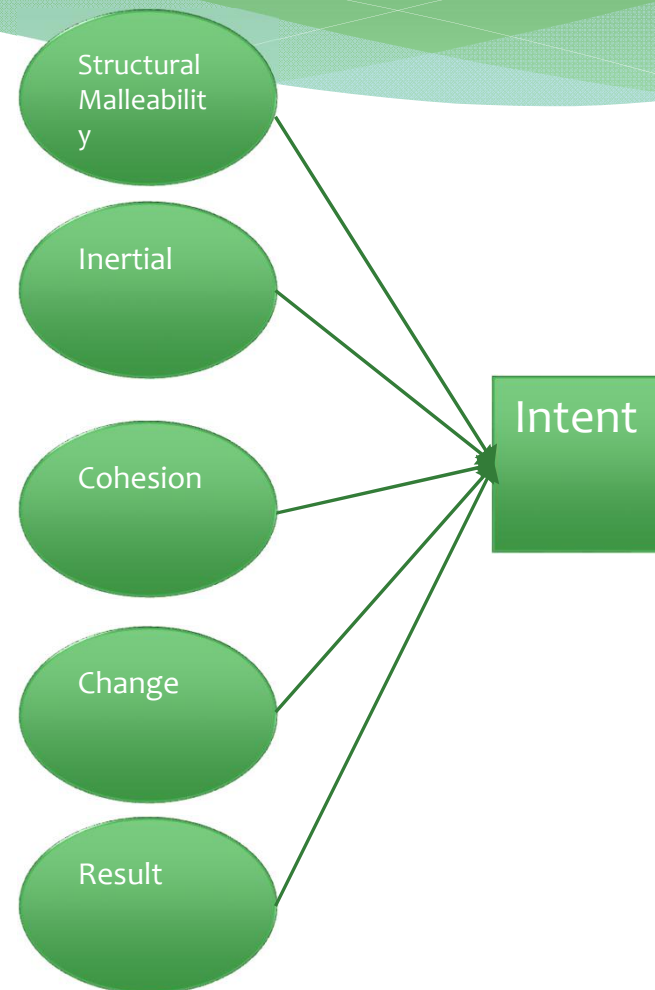
Self-efficacy and Barriers

* Further inspection of the relationships finds that the sense of self-efficacy related more specifically to personal change is itself related to the perception of barriers.
 * The model explains about 30% of the variance in barriers
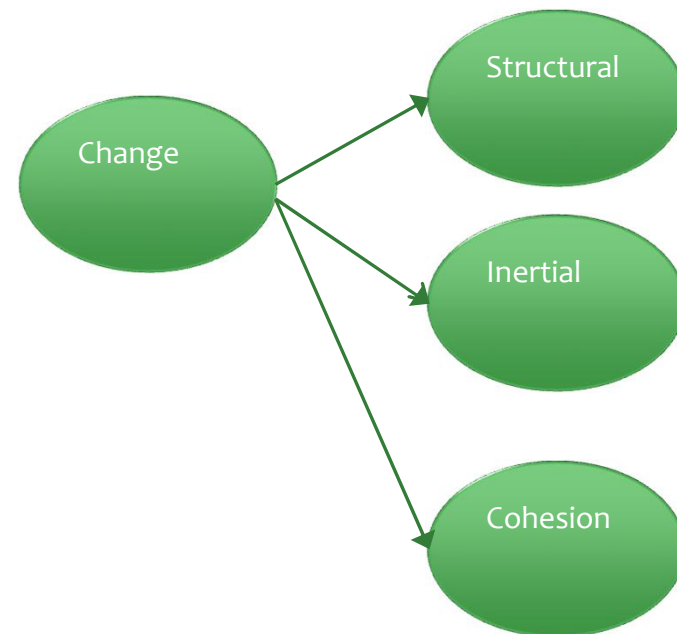
Our Preliminary Model

* Unlike the HAPA model, our results suggest that barriers to implementation mediate the effect of self-efficacy in these data

* Our results also find a much less significant effect for result related efficacy
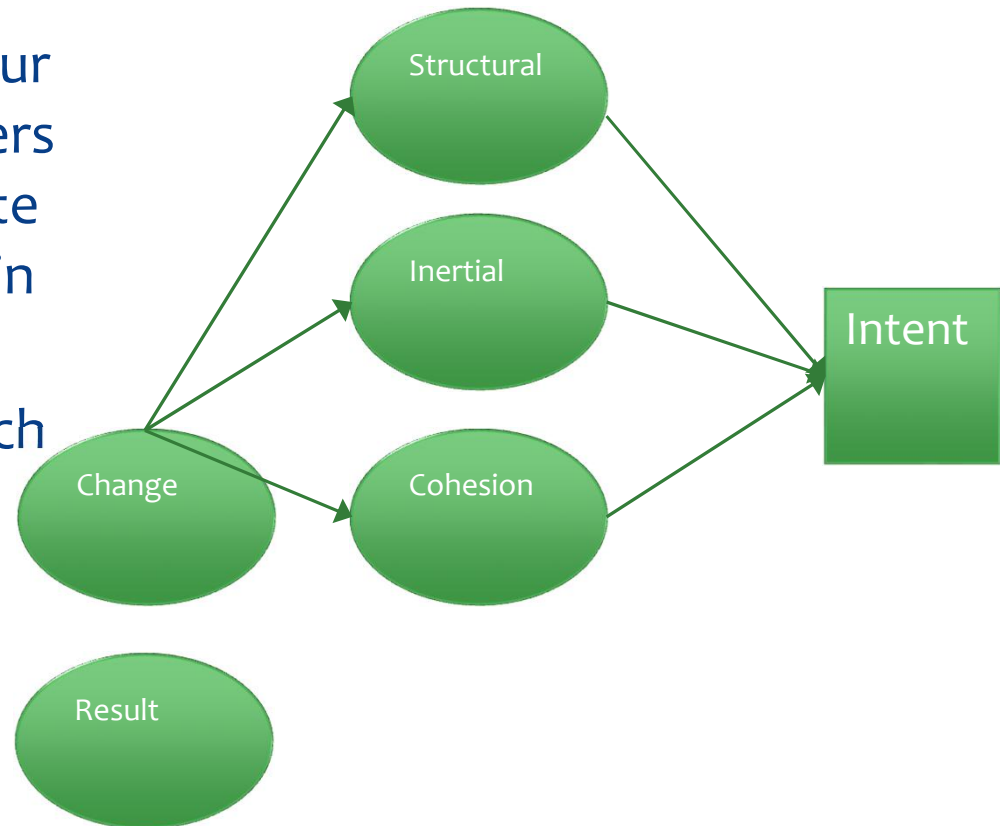
The overall analysis shows a significant relationship

* Specifically the sense of efficacy in effecting change in the practice environment, a sense of structural barriers to change, as well as, the sense of personal and staff resistance to change are predictive of formation of an intent to change behavioral patterns.
* The self-efficacy construct, however, appears to manifest in the sense of the barrier rather than directly in the formulation of intent.

Remember
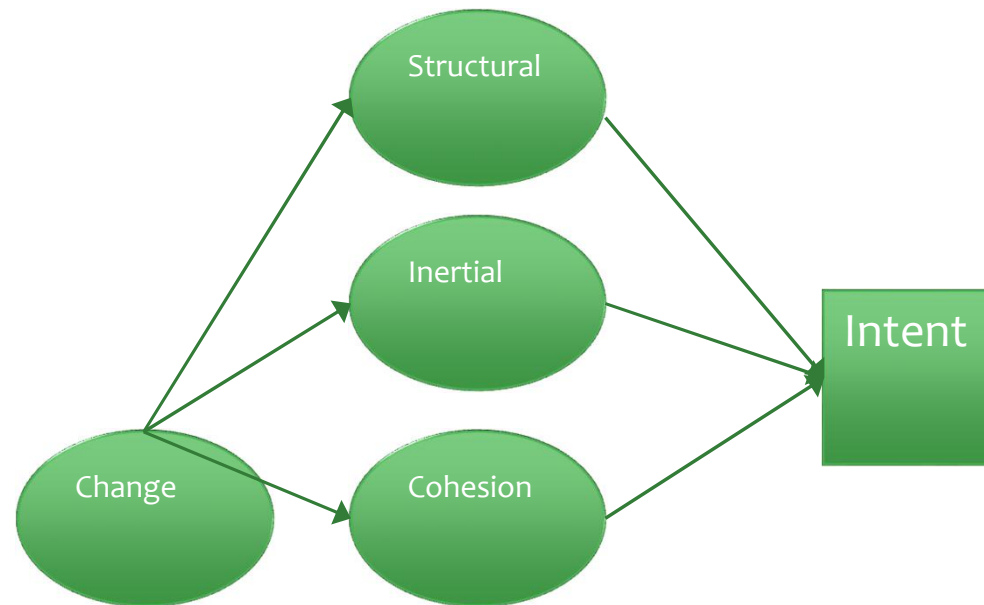
Conclusion

* Inspection of the barriers constructs suggests that they mediate the self-efficacy constructs' effect on intent. The relationship between self-efficacy and intent to change appears to be related to the participants' sense of the impediment caused by the barrier at question. The proximal barrier completely masks an important underlying causal relationship that ultimately contributes to effective efficiency improvement through training.

Next Steps

* Several issues need to be studied further.
  * A full model with all observed variables in needs to be tested and confirmed – at this point the choice variable is entered as if it is directly measured;
  * The two instruments, while serviceable, could do with strengthening; and,
  * An experimental manipulation to fully demonstrate the causal relationships needs to be attempted.