Handout

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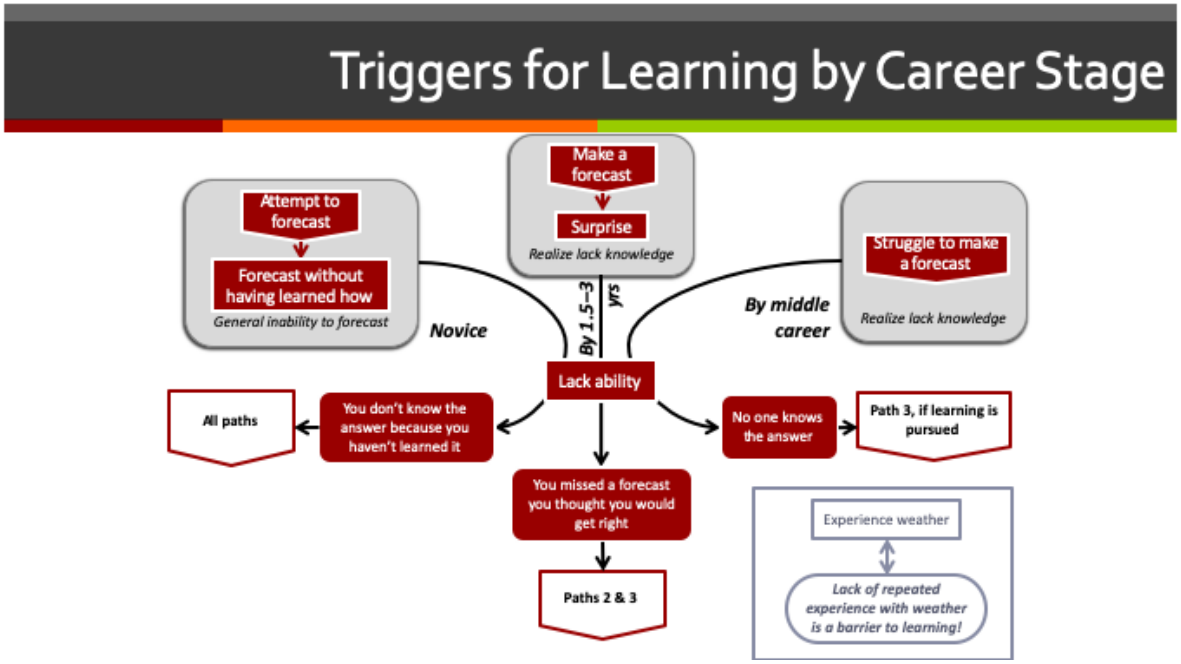
This handout contains key concepts from my dissertation research and from cognitive sciences that have implications for facilitating the learning of professional forecasters.

Main Dissertation Results



Left side: Novice

- A new forecaster has not learned how to forecast, but they are asked to start forecasting.

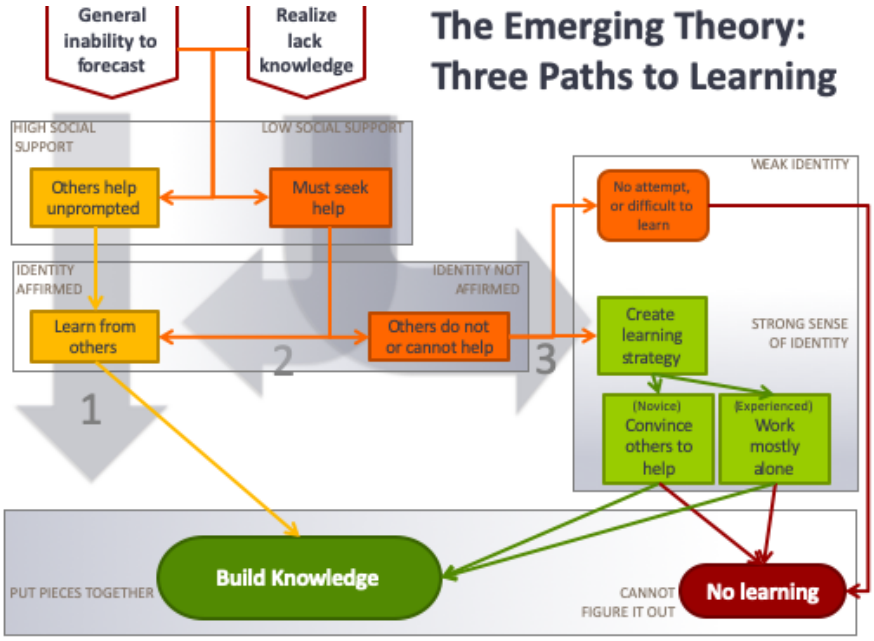
Middle: Early Career

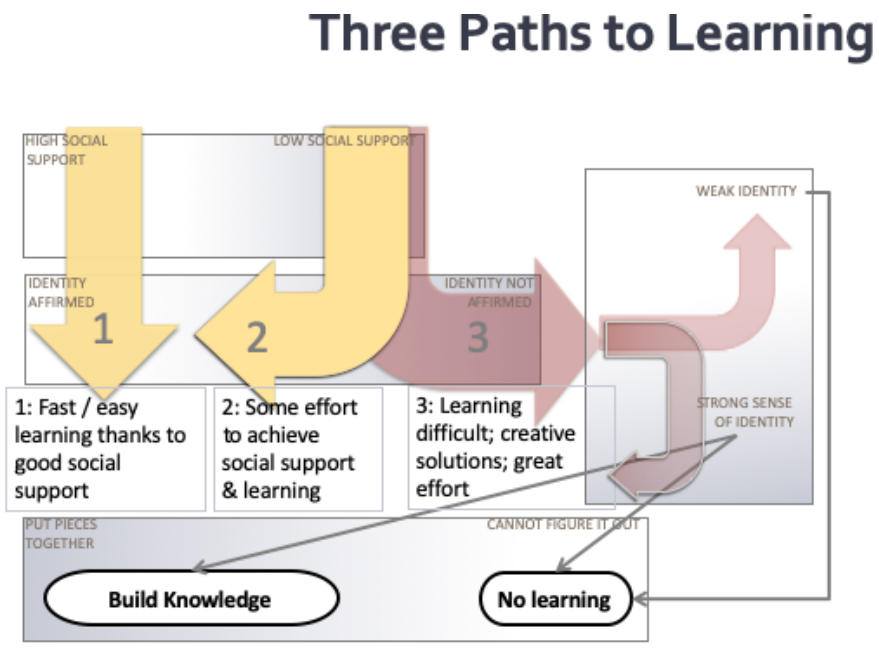
- After 1.5–3 yrs, for example, after having experienced a full year of forecasting at a location, forecasters are doing okay most of the time, but a forecast goes bad when they did not expect, because there was still more to learn.

Right side: Middle/Late Career

- By middle career, forecasters (should) have high competence, but there are persistent forecast issues because the state of the science isn't good enough. If a forecaster takes this on, they are not only learning for themselves, but also advancing the science of forecasting.

Two key diagrams:





Expertise in Weather Forecasting: Two Views

Pliske et al.'s 1997 study of weather forecasters:

Category	Characteristics	Level of Expertise
Disengaged	Limited knowledge base of rules; unmotivated to improve	Novice
Procedure-based mechanics	Limited knowledge of rules; always used same sources of information in same sequence; locally proficient; lacked motivation to improve	Advanced beginner
Procedure-based observers	Knowledge of rules insufficient to construct a useful mental model; lacked understanding of weather as a global system; keen observational skills; motivated to improve	Competent
Rule-based scientist	Extensive knowledge base of rules; high-level pattern recognition skills; integrated a wide variety of information sources; constructed a complete and useful mental model; used an analytic reasoning style	Proficient
Intuitive-based scientists	Used highly visual, dynamic mental models; high-level pattern recognition skills; flexible use of information sources depending on problem of the day; did not think in terms of rules	Expert

Linking my data to the notion of expertise: