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# LEWINIAN MASH-UPS: TOPOLOGY, NETWORK ANALYSIS, MOTION CAPTURE, AND COMPUTATIONAL MODELING OF CROWDS

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## Abstract

Modern powerful methods are used to revive classical Lewinian field theory concepts. This "poster symposium" will describe a unique convergence of vector psychology, topology, social network analysis, motion capture, and computational modeling methods. This poster introduces the U.S. Army's Target Behavioral Response Laboratory, an interdisciplinary group that evaluates effectiveness of non-lethal weapons, and introduces the conceptual framework for four subsequent posters on the Crowd Behavior Research Program at the TBRL. Novel resulting approaches and analyses can be brought to bear on the challenges of crowd behavior experimentation.

## Overview

Collective behavior of crowds – Daunting area of social psychology research!

### Target Behavioral Response Laboratory (TBRL) purpose:

- Experimentally Evaluate Non-Lethal Weapon Effectiveness
- Includes mission to understand crowd behavioral response to non-lethal weapons

### Symposium of five posters – Report here on a convergence effort from disparate scientific domains to meet that mission:

- Engineering, mathematical, and computer research personnel
- Behavioral Sciences: Social & Experimental Psychologists, Behavioral Neuroscientists
- Interdisciplinary and unique effort has produced laboratory experimentation with crowds (14 research sessions so far, from small indoor crowds to a large outdoor crowd of 89)

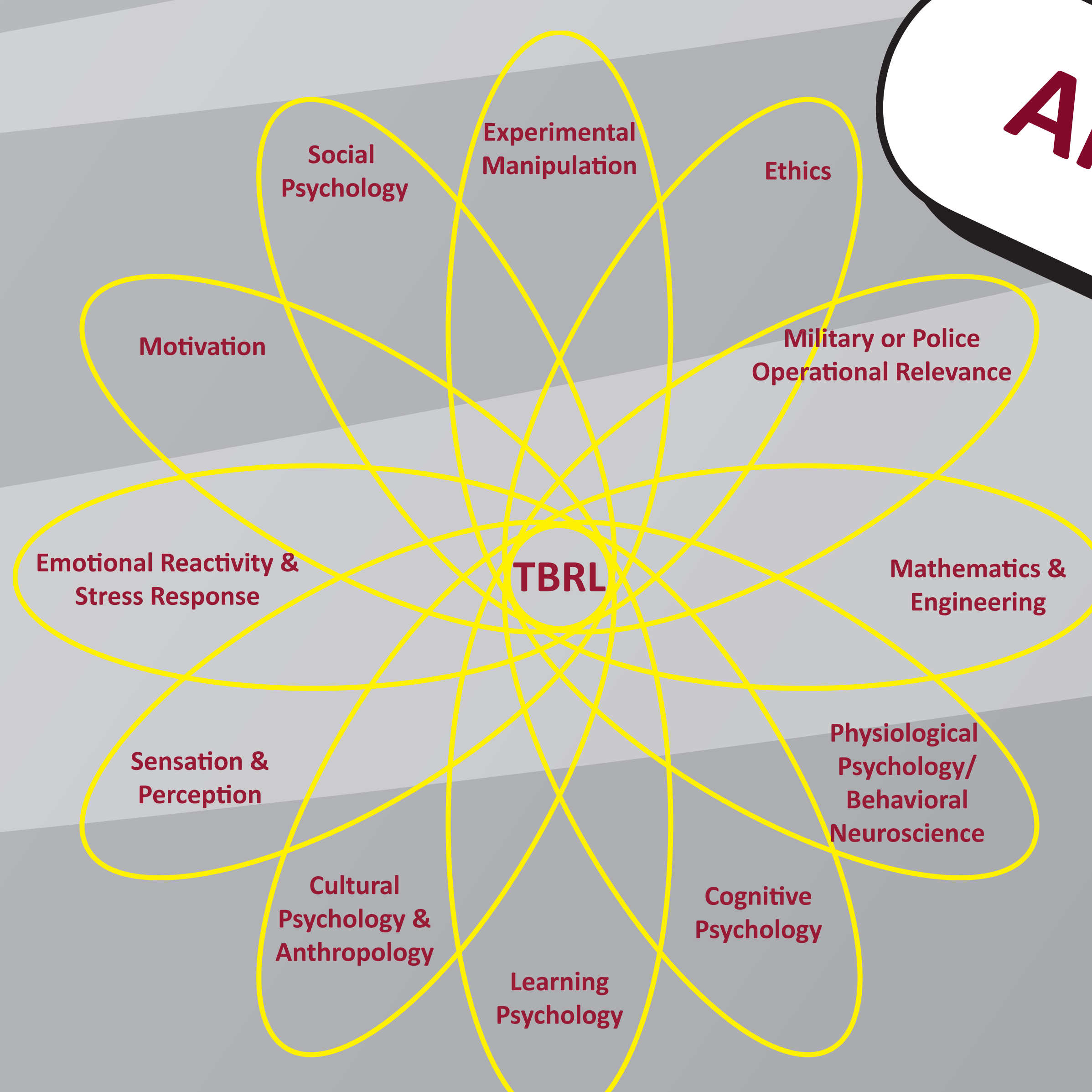
### Conceptual framework of crowd behavior research program: Lewinian Field Theory.

### This is the overview poster. What else you will see:

- Poster 2: How field theory methods and concepts are used (goal regions, valenced psychological forces, locomotion to and away from)
- Poster 3: Motion capture methods to record crowd behavior, transformation into aggregate metrics of crowd-level behavior, concrete visualizations of underlying psychological forces
- Poster 4: Social network analysis to capture crowd-level sociometrics among individual members (prior acquaintance, social interaction, leadership) that affect crowd behavior.
- Poster 5: Computational models fed by empirical data (modeling and simulation efforts, extrapolating from small crowds to larger crowds)

## Questions

- How can you characterize the nature of a crowd?
- What does a crowd do?
- How can you measure crowd behavior?
- How can you describe how a motivated crowd behaves?
- Can you capture changes in crowd motivation from their behavior?
- How do you compare the effectiveness of different crowd interventions?



Fields of study that define the TBRL mission

## Conclusions

1. Experimentation on human crowds can be conducted
2. Meaningful measures of crowd behavior can be obtained and analyzed
3. Manipulations of motivations can produce predictable results on crowd behaviors that help to model behaviors of larger crowds
4. Human studies of Non-Lethal Weapons interventions on crowds can illuminate our community and national choices