

Measurement Guide for Group Affect Model

Introduction

This guide provides detailed measurement specifications for each variable in the group affect model. The measurements are designed to capture the temporal dynamics of group emotional processes and their relationship to group flow.

1. Timing of the First Individual's High-Activation Positive Emotion Display

Component	Specification
Primary Measure	Time in seconds from interaction start
Thresholds	Valence > 0.5 (positive) Arousal > 0.5 (high activation)
Data Source	Video/audio analysis
Collection Method	Automated emotion recognition Manual verification
Unit	Seconds

2. Frequency of High-Activation Positive Emotion Displays in Group

Component	Specification
Primary Measure	Count per time unit (e.g., per minute)
Calculation	(Number of high-activation positive displays) / (Total time in minutes)
Thresholds	Same as above: Valence > 0.5 Arousal > 0.5
Data Source	Continuous video/audio analysis
Unit	Displays per minute

3. Speed of Group Positive Affective Convergence

Component	Specification
Primary Measure	Time to convergence in seconds
Operationalization	SD of group members' V-A values < 0.2
Calculation	Time from start until SD < 0.2
Alternative Measure	Rate of convergence (change in SD over time)
Unit	Seconds or SD/min

4. Onset of Group Flow

Component	Specification
Measurement Type	Binary (0/1) or Continuous (0-1)
Binary Criteria	1 = Flow achieved when: <ul style="list-style-type: none">- Group shows synchronized behavior- High engagement levels- Smooth interaction patterns
Continuous Components	<ul style="list-style-type: none">- Behavioral synchronization (0-1)- Engagement level (0-1)- Interaction smoothness (0-1)
Data Sources	Video analysis Behavioral coding Self-report measures
Unit	Binary or 0-1 scale

5. Behavioral Synchronization

Component	Specification
Primary Measure	Movement synchronization index (0-1)
Components Measured	<ul style="list-style-type: none">- Body posture alignment- Gesture timing- Speech rhythm coordination- Turn-taking synchrony

Calculation Methods	<ul style="list-style-type: none"> - Cross-correlation of movement signals - Phase synchronization analysis - Nonlinear coupling measures
Time Windows	<ul style="list-style-type: none"> - Short-term: 10-30 seconds - Medium-term: 1-5 minutes - Long-term: Entire interaction
Thresholds	<ul style="list-style-type: none"> - Low sync: < 0.3 - Moderate sync: 0.3-0.7 - High sync: > 0.7
Data Sources	<ul style="list-style-type: none"> - Motion capture data - Video analysis - Audio features - Interaction timestamps

Data Collection Methods

Method	Application
Video Analysis	<ul style="list-style-type: none"> - Facial expression recognition - Body movement tracking - Interaction pattern analysis
Audio Analysis	<ul style="list-style-type: none"> - Voice tone and intensity - Speech patterns - Turn-taking dynamics
Behavioral Coding	<ul style="list-style-type: none"> - Manual video coding - Specific behavioral indicators - Synchronization ratings
Self-report Measures	<ul style="list-style-type: none"> - Flow state scales - Engagement questionnaires - Group cohesion measures