The Effect of Motion on Infants' Processing of Novel Faces
Emily Touchstone & Melanie Spence
The University of Texas at Dallas

Introduction
The role of motion in identity processing

Adult Literature
Roark, Abd, Barrett, Spence, & O'Toole (2003): In review of previous findings reported in the literature, Roark, et al., conclude that there is much inconsistency in the adult literature regarding identity processing, particularly the role played by rigid and non-rigid facial movement.
Landar & Bruce (2003): Faces were more accurately recognized by adults when the faces during familiarization were presented in dynamic form, or in a series of static form with multiple angles rather than static alone.
Knappmeyer, et al (2003): In several experiments, the researchers imposed motion on morphed facial images and concluded that adults use non-rigid motion in identity processing more than rigid motion or static alone.
Pike (1997): Adults demonstrate an advantage for dynamic presentation of faces over static during familiarization; however, this study, like most, uses only static faces during test trials.
Roark & O'Toole (in press): Motion facilitates recognition of unfamiliar faces, but only when the faces are presented in dynamic form for both familiarization and test trials.

Infant Literature
Spencer, O'Brien, Johnston, Hill (in press): Infants demonstrate the ability to discriminate both moving sequences on faces and the identity of faces in motion.
Otsuka (in press): Motion facilitates identity processing for infants when faces during test trials are put in motion. A single static face was used during test trials.

Design
Babies were habituated to a series of 3 female faces portraying either happy (happy) or negative (disgust) expressions in an infant-controlled habituation procedure. Subsequently, a novel face portraying the same emotional expression was presented and looking time was measured. A repeated measures ANOVA compared the looking times for the different groups.

Number of Habituation Trials
<table>
<thead>
<tr>
<th>Design</th>
<th>Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Habituation</td>
</tr>
<tr>
<td>9</td>
<td>Habituation</td>
</tr>
<tr>
<td>12</td>
<td>Habituation</td>
</tr>
<tr>
<td>15</td>
<td>Habituation</td>
</tr>
</tbody>
</table>

Results:
Repeated Measures ANOVA: Motion (Dynamic vs. Static) X Trial Blocks (End Hab vs. Test) X Familiarization (less familiar vs. more familiar)
Trial Blocks Main Effect: F(1, 107) = 21.39, p < .000

Pairwise Comparison: Static
Less familiar (6&9 trials)
Trial Blocks End Hab & Test:
Mdiff: -1.548, SE= .572, p = .012
More familiar (12&15 trials)
Trial Blocks End Hab & Test:
Mdiff: -2.775, SE=1.153, p = .005

Pairwise Comparison: Dynamic
Less familiar (6&9 trials)
Trial Blocks End Hab & Test:
Mdiff: -2.252, SE=.712, p = .002
More familiar (12&15 trials)
Trial Blocks End Hab & Test:
Mdiff: -1.820, SE=1.217, p = .146

Discussion
At 6 months of age, infants are able to identify new faces following habituation to a series of 3 faces in both moving and static conditions. However, it is not evident that motion facilitates recognition, per se. There are interesting trends to point out:
1. Infants in the dynamic group who have experienced the faces fewer times (2 or 3) appear to be more likely to recognize a new face, while those who have experienced the faces multiple times (4 or 5) do not demonstrate recognition of a new face.
2. Infants in the static group are able to recognize a new face regardless of the number of times faces are viewed (2, 3, 4 or 5).

Acknowledgments
This research was funded by:
Timberlawn Psychiatric Research Foundation Award
UTDallas Faculty Research Initiative Award
The stimuli were provided by the DOD/DARPA Human ID Project (O'Toole, Harms, Brew, Hurst, Pappas & Abidi, 2005).

Presented at the 15th biennial conference of the Society for Research in Human Development, Fort Worth, TX March 2006