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**THE CONTROL OF REACHING MOVEMENTS
BY YOUNG INFANTS**

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Doctor of Philosophy
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*This thesis describes original
research carried out by the author
during the tenure of an
Australian National University
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Department of Psychology of the
Australian National University.*

A handwritten signature in black ink, appearing to read 'Mathew', with a stylized initial 'A'.

Anne Mathew

PREFACE

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A portion of the study reported in this thesis has been accepted for publication.

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ABSTRACT

Infant reaching movements have tortuous handpaths and multi-peaked speed curves. It has been hypothesised that these movements comprise sequences of ballistic motor units whose boundaries are marked by troughs in the speed-time curve. Error correction, if any, is assumed to take place between and not within these movement units. This hypothesis was investigated in this study. Samples of reaches were obtained from groups of infants aged 4.5, 6 and 7.5 months as split-screen video recordings, which were then transcribed as sequences of (x,y,z) hand coordinates. There was an improvement in overall efficiency in reaching across the three age groups. Movement paths were examined for evidence of initial aiming and subsequent correction. At all ages, the initial direction of the movement was correlated with target direction, providing evidence that the hand was aimed towards the target. Additionally, changes in movement direction made after the commencement of the movement tended to curve the hand path towards the target, providing evidence of error correction. Local minima of hand speed evident within segments of continuous movement were associated with turn towards the target. However, the movement path was also curved towards the target within the movement elements bounded by these minima. This finding was seen as being consistent with 'continuous' correction of movement errors and as contrary to the suggestion that infant movements are concatenations of ballistic movement units whose boundaries are marked by troughs in the speed profile.