INTRODUCTION

• During everyday language comprehension we are immediately able to use relevant linguistic and non-linguistic information, e.g. the wider discourse and its genre, as well as the intensions, beliefs and desires of others (ToM), to enhance comprehension of an unfolding sentence.

• Typically, investigations of ToM have centred around impairments of this ability (Baron-Cohen, 2000; Frith & Frith, 1988; Tager-Flusberg, Boshart & Baron-Cohen, 1998) or locating a neurological basis for ToM reasoning (Gallagher & Frith, 2003).

• However, this research is limited by the use of traditional response-based measures, thus very little is known about the on-line processes when comprehenders use ToM.

METHOD

EXPERIMENT 1

• SMI Eyelink II head-mounted eye-tracker
• 24 experimental items in a fixed random order alongside filler items
• 28 native English speakers (16 female)
• Within-subjects 2x2 design

EXPERIMENT 2

• SRI Dual Purkinje Generation 5.5 eye-tracker
• 32 experimental items displayed in a fixed random order alongside fillers
• 32 native English speakers (18 female)

EXPERIMENT 1 - RESULTS

• Participants anticipated towards a contextually relevant referent from 560 msec prior to critical word onset
• Clusters 1 and 2 showed a significant gender x context interaction
  ✓ Females (top right) showed very early (1500 msec prior to target word onset) context-biased expectancies on the task, while males (bottom right) showed no significant anticipation towards a referent in this task

EXPERIMENT 2 - RESULTS

• Critical words in a ‘belief’ context were initially fixated for longer than in a ‘reality’ context
  ✓ Implies that processing information according to the beliefs of others requires more cognitive effort than does reality
• Words that were inconsistent with a prior ‘reality’ or ‘belief’ context led to later processing difficulties at the critical word and influenced the likelihood of regressive eye movements in the following region
  ✓ Suggests that language processing has shifted to fit the perspective of the character regardless of readers’ own knowledge about the narrative-based reality

CONCLUSIONS

• When readers are provided with privileged information about a given character’s (false) belief this elicits very early expectancy effects that modify the constraints of narrative reality
• BUT, when these expectations conflict with later described events, this rapidly leads to processing difficulties during reading
  ✓ Importantly, this means that interpreting and predicting other peoples’ subsequent actions occurs on-line during language comprehension
• Females show an early processing advantage for predicting and integrating information based on beliefs of others