

Introduction

Research shows that language affects non-linguistic processing (Loewenstein & Gentner, 2005; Feist & Gentner (2007). However, it is not yet known *how* language does this. We examined the effect of language at encoding on memory for object location. In three different studies, the use of demonstratives (*this/that*) and possessives (*my/your*) was manipulated.

Participants read out instruction cards to indicate to the experimenter which object to place and where to place it (see Figure 1). We were interested in the influence of the specific term on the card on memory for object location. We aimed to tease apart two models explaining the effects of language on memory for location (see Figure 2).

Method

Participants memorized spatial locations of objects placed at locations varying in distance on a table (Coventry, Valdés, Castillo, & Guijarro-Fuentes, 2008), see Figure 1. In two different studies, object placement was combined with the use of demonstratives (*this/that*; N=32) or possessives (*my/your*; N=34). A third study was run to test a possible third variable of attention (N=16).

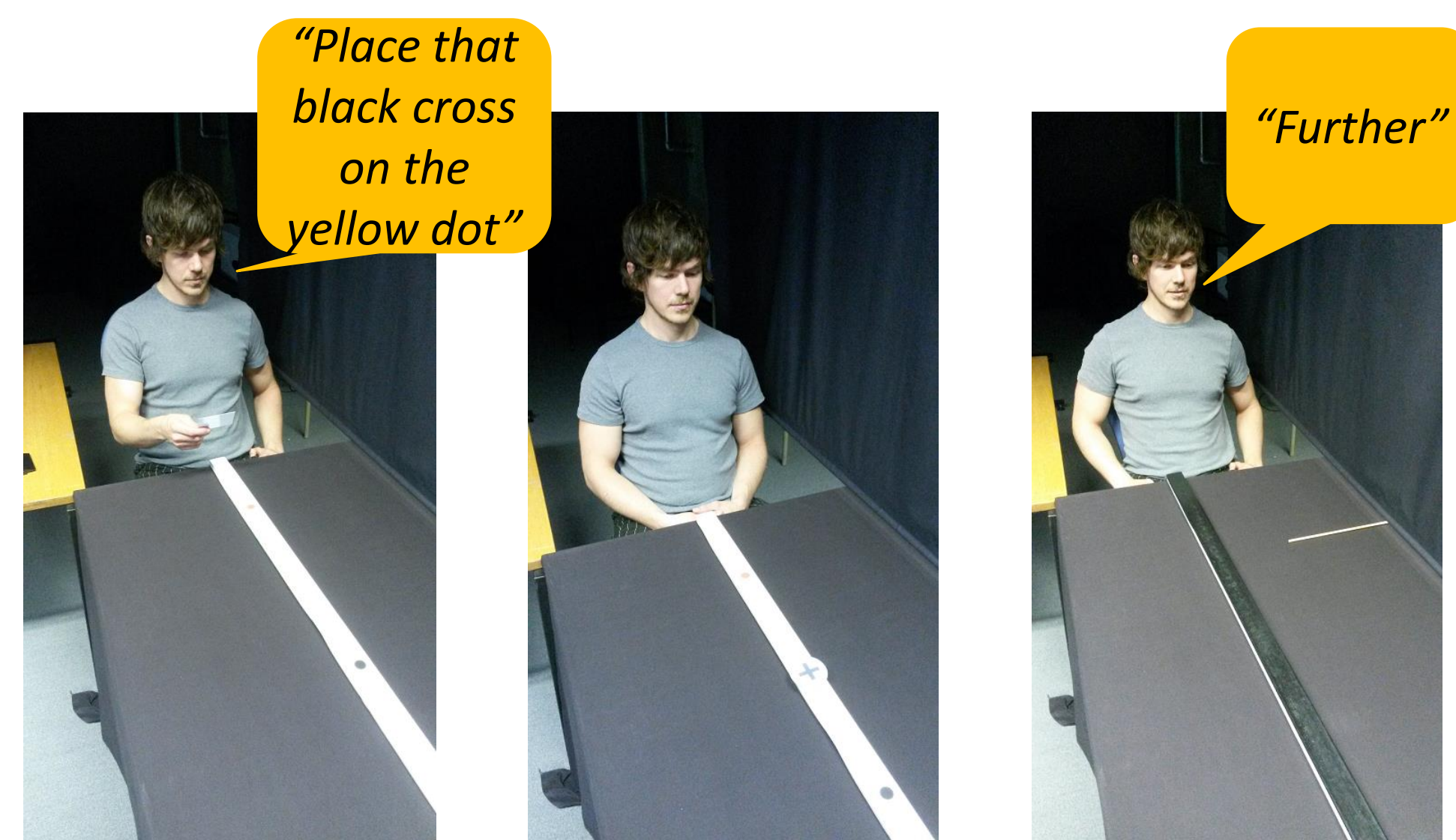


Figure 1: Overview of the procedure of the experiments. From left to right: The participant reads out the instruction → the object is placed and then removed → participant verbally directs the experimenter to move the indication stick to where the object was.

Predictions

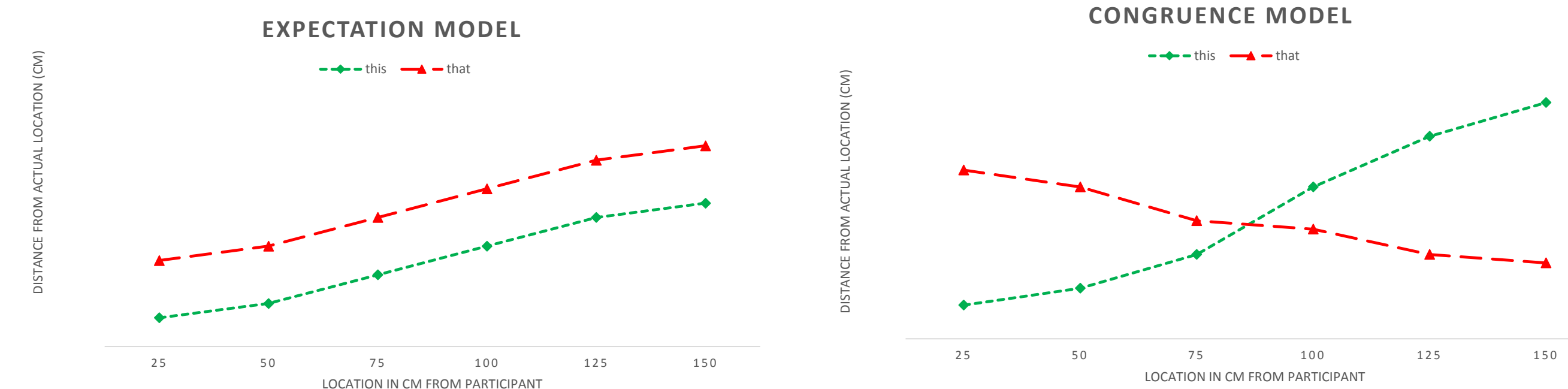


Figure 2: Predicted results by the expectation model (left) and the congruence model (right)

Results

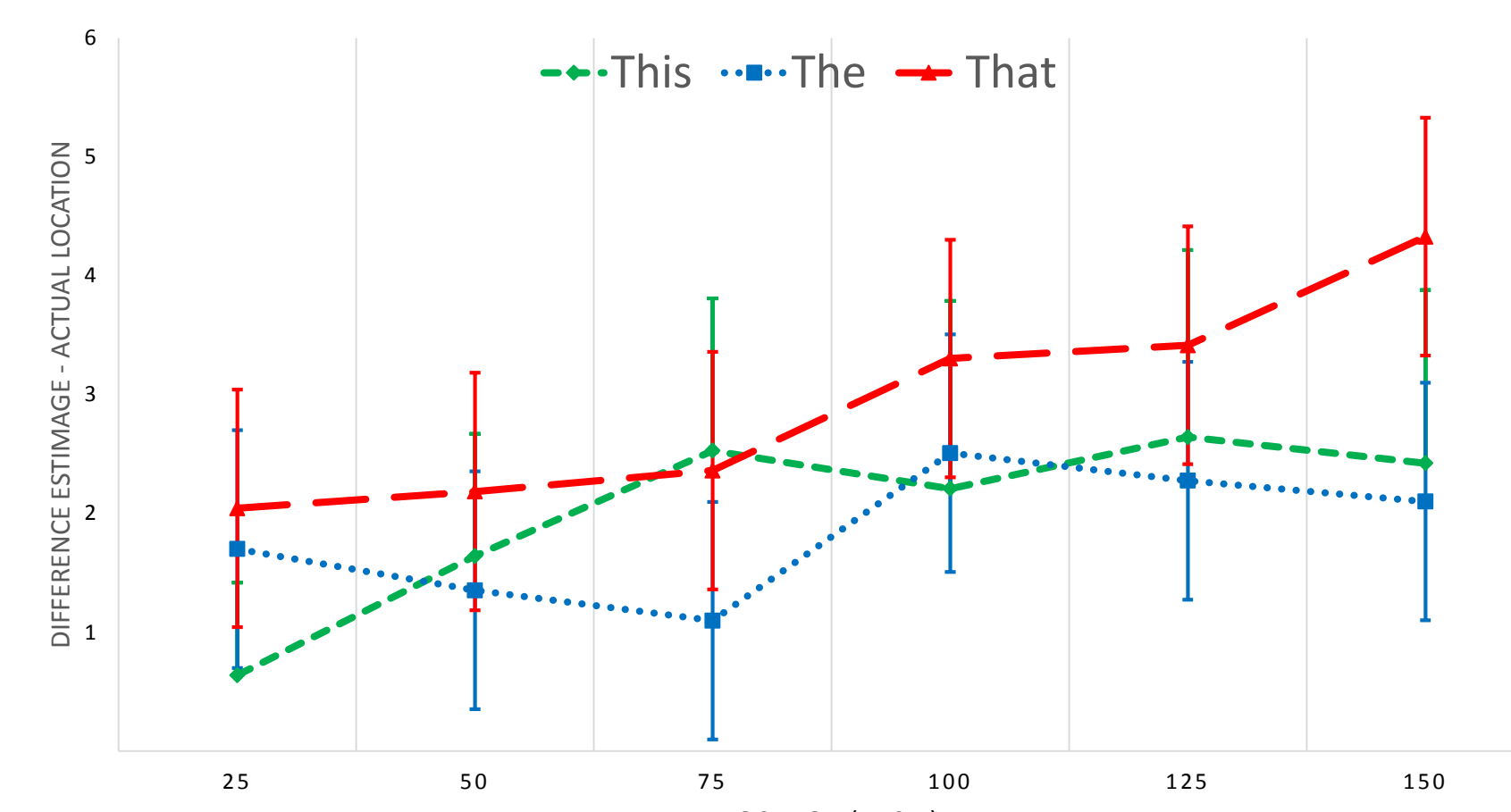


Figure 3: Experiment 1: Demonstratives * Location (N=32, $p = .02$, partial $\eta^2 = .12$) (Errorbars are confidence intervals)

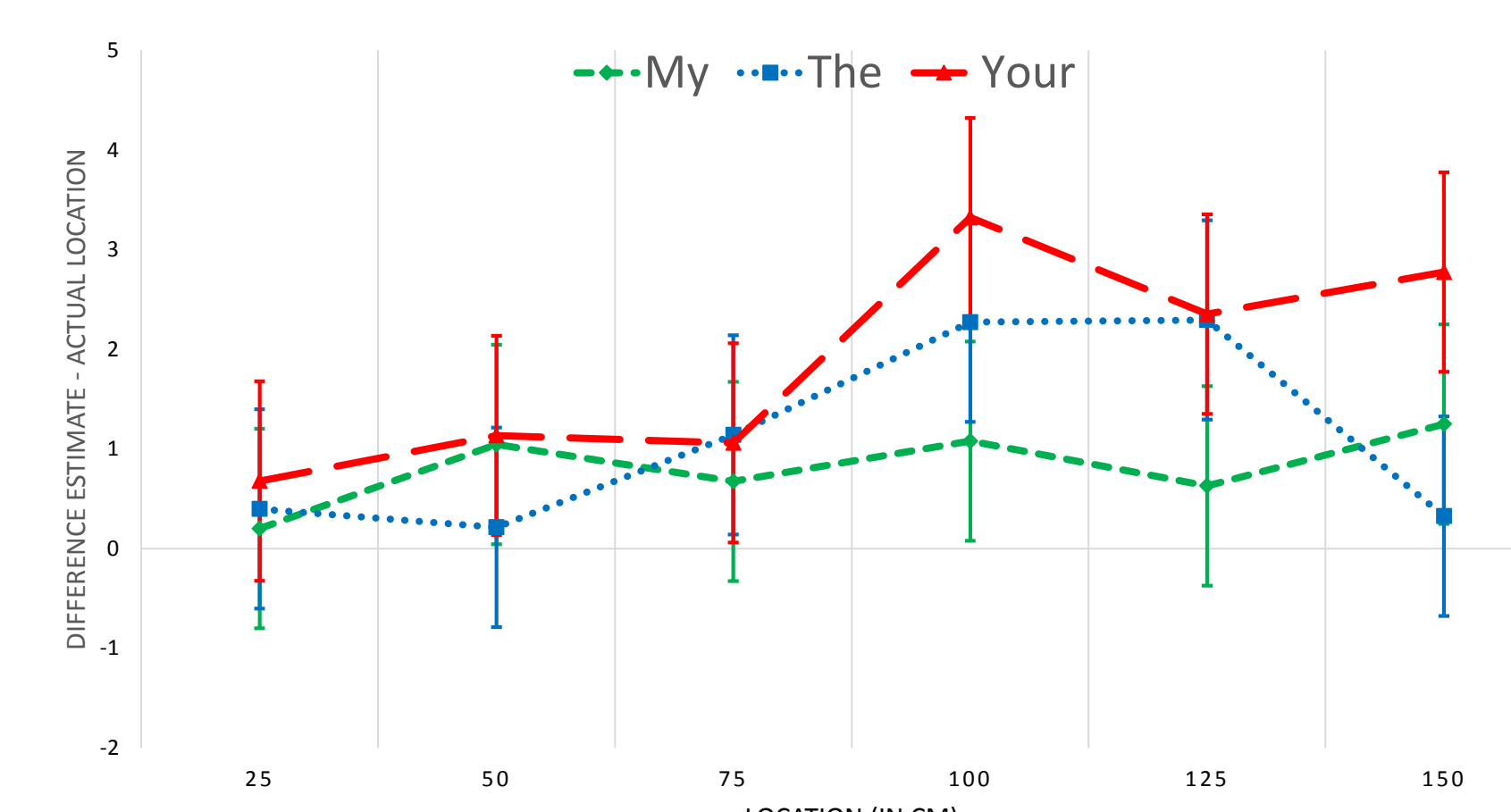


Figure 4: Experiment 2: Possessives * Location (N=34, $p = .001$, partial $\eta^2 = .2$)

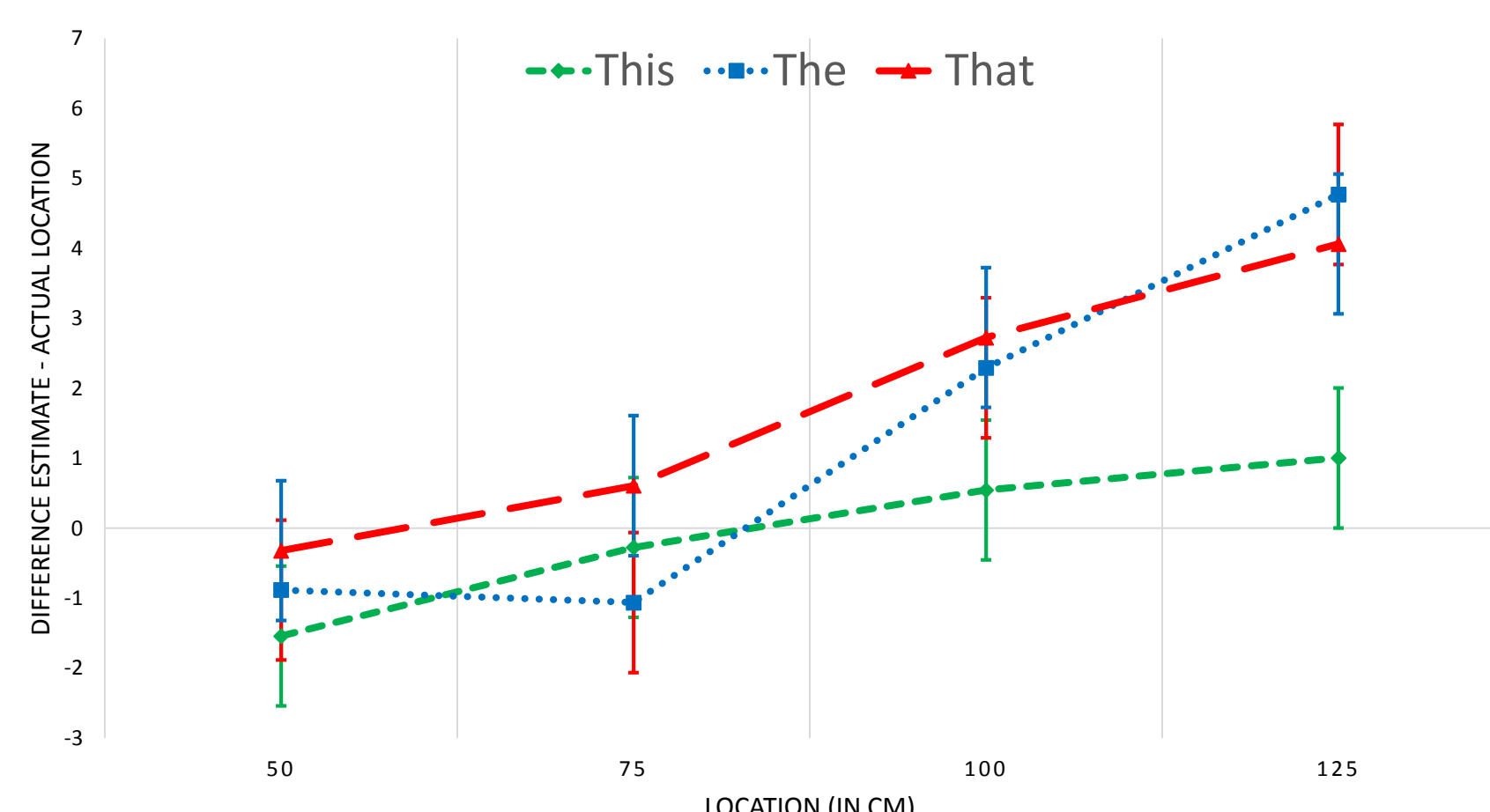


Figure 5: Experiment 3a: Behavioural data: Demonstratives * Location (N=16, $p < .01$, partial $\eta^2 = .28$) (Errorbars are confidence intervals)

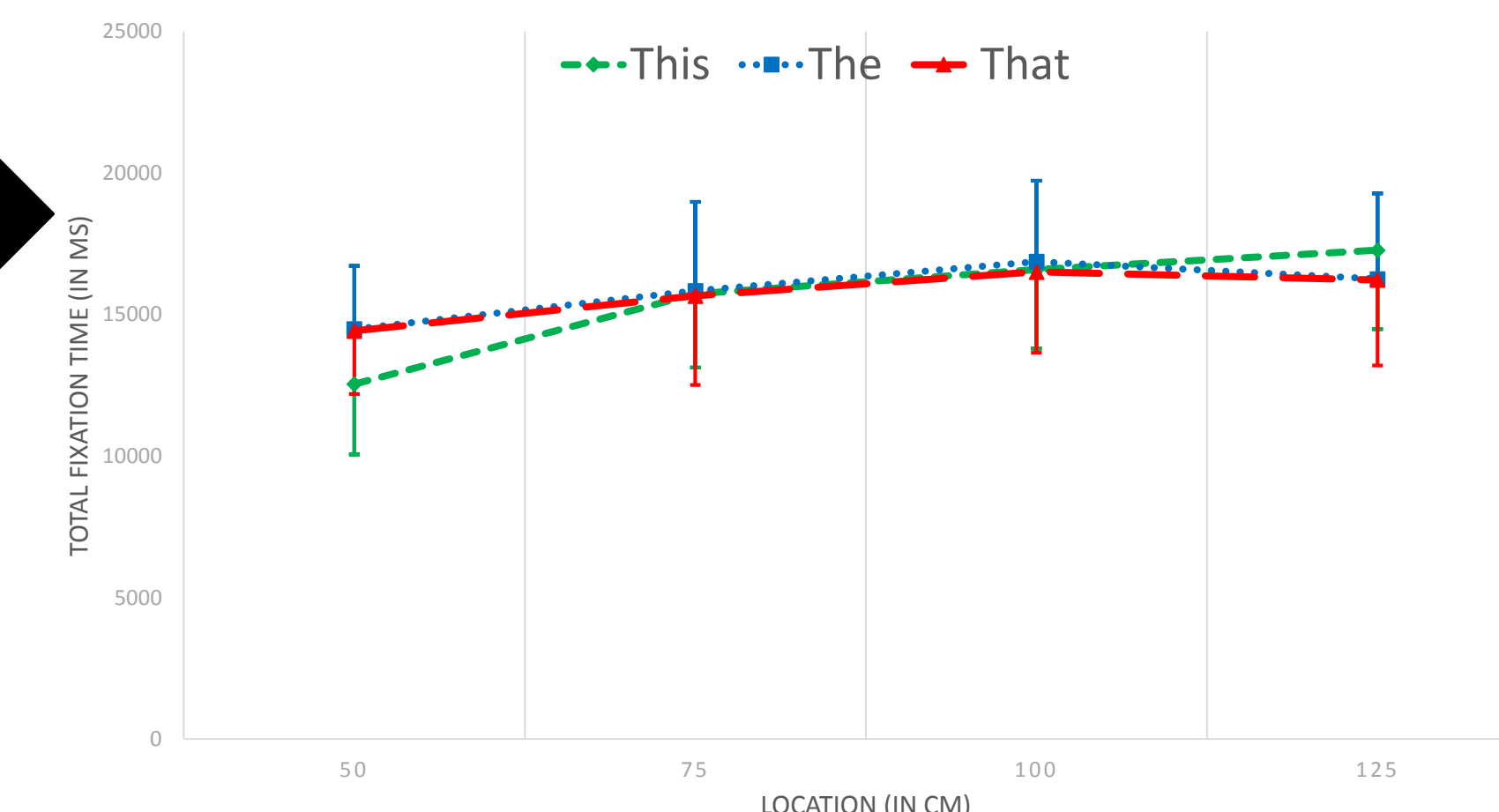


Figure 6: Experiment 3b: Gaze data: Demonstratives * Location ($p = .81$, partial $\eta^2 < .01$) (Errorbars are confidence intervals)

Results

The first experiment revealed a main effect of demonstratives. People misremember object locations as being closer when the placement is presented combined with the demonstrative *“this”* ($M = 2.01$, $SD = .41$) compared to *“that”* ($M = 2.94$, $SD = .42$) (see Figure 3). A repeated contrast test showed that *“that”* was misremembered significantly further than *“this”* and *“the”*, $p < .05$. There is also an effect for location ($p = .045$, partial $\eta^2 = .07$), but there is no interaction between demonstrative * location ($p = .18$, partial $\eta^2 = .04$).

The second experiment showed a similar effect of possessives in which objects presented with *“my”* ($M = .81$, $SD = .34$) were misremembered to be closer by than objects in the *“your”* ($M = 1.89$, $SD = .43$) condition, $p < .05$ (see Figure 4). There was an effect for location ($p = .02$, partial $\eta^2 = .09$) and an interaction effect ($p = .02$, partial $\eta^2 = .07$). There was a location effect for the *“the”* and *“your”* conditions (both $p < 0.05$), but not for the *“my”* condition ($p < 0.05$).

The third experiment (N=16) replicated Experiment 1 (see Figure 5). Words in the *“this”* condition were misremembered significantly closer than *“that”* and *“the”*, $p < .05$. However, no language effect on absolute fixation time was found (see Figure 6), suggesting that language does not change the time participants focused on a specific object.

Discussion

Results show the first evidence for the influence of language on memory for object location. In the three experiments demonstratives and possessives had effects on spatial memory, in which objects in the *this/my* conditions were misremembered to be closer compared to the *that/your* conditions.

Results from all three Experiments showed that language affects memory for object location. However, the interaction effect that would be predicted by the congruence account was not found. Also, the results of Experiment 3 showed no difference in attention time in different language conditions. Overall the results support the expectation model.

References:

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