

# The representation and processing of distributivity and collectivity: ambiguity vs. underspecification

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## **Items of Experiment 1**

- (1)
  - a. The students individually read a book when they were in the library.
  - b. The students together read a book when they were in the library.
  - c. The students read a book individually when they were in the library.
  - d. The students read a book together when they were in the library.
- (2)
  - a. The girls individually wrote a sonnet after they had read Shakespeare.
  - b. The girls together wrote a sonnet after they had read Shakespeare.
  - c. The girls wrote a sonnet individually after they had read Shakespeare.
  - d. The girls wrote a sonnet together after they had read Shakespeare.
- (3)
  - a. The rich women individually walked a dog after they had eaten dinner.
  - b. The rich women together walked a dog after they had eaten dinner.
  - c. The rich women walked a dog individually after they had eaten dinner.
  - d. The rich women walked a dog together after they had eaten dinner.
- (4)
  - a. The professors individually graded a paper after their meeting had concluded.
  - b. The professors together graded a paper after their meeting had concluded.
  - c. The professors graded a paper individually after their meeting had concluded.
  - d. The professors graded a paper together after their meeting had concluded.
- (5)
  - a. The boys individually lost a game while playing at the arcade.
  - b. The boys together lost a game while playing at the arcade.
  - c. The boys lost a game individually while playing at the arcade.
  - d. The boys lost a game together while playing at the arcade.
- (6)
  - a. The ambitious girls individually won an award during the science fair.
  - b. The ambitious girls together won an award during the science fair.
  - c. The ambitious girls won an award individually during the science fair.
  - d. The ambitious girls won an award together during the science fair.
- (7)
  - a. The volunteers individually cooked a dish for the Thanksgiving potluck this year.
  - b. The volunteers together cooked a dish for the Thanksgiving potluck this year.
  - c. The volunteers cooked a dish individually for the Thanksgiving potluck this year.
  - d. The volunteers cooked a dish together for the Thanksgiving potluck this year.
- (8)
  - a. The self-coached athletes individually ran a mile before they lifted weights.
  - b. The self-coached athletes together ran a mile before they lifted weights.
  - c. The self-coached athletes ran a mile individually before they lifted weights.
  - d. The self-coached athletes ran a mile together before they lifted weights.
- (9)
  - a. The women individually sailed a ship from San Francisco to Monterey.

- b. The women together sailed a ship from San Francisco to Monterey.
  - c. The women sailed a ship individually from San Francisco to Monterey.
  - d. The women sailed a ship together from San Francisco to Monterey.
- (10)
- a. The brothers individually quit a well-paying job after they won the lottery.
  - b. The brothers together quit a well-paying job after they won the lottery.
  - c. The brothers quit a well-paying job individually after they won the lottery.
  - d. The brothers quit a well-paying job together after they won the lottery.
- (11)
- a. The sisters individually painted a masterpiece when they were at school.
  - b. The sisters together painted a masterpiece when they were at school.
  - c. The sisters painted a masterpiece individually when they were at school.
  - d. The sisters painted a masterpiece together when they were at school.
- (12)
- a. The doctors individually published a book after discovering new treatment procedures.
  - b. The doctors together published a book after discovering new treatment procedures.
  - c. The doctors published a book individually after discovering new treatment procedures.
  - d. The doctors published a book together after discovering new treatment procedures.
- (13)
- a. The children individually drew a picture on their first day of school.
  - b. The children together drew a picture on their first day of school.
  - c. The children drew a picture individually on their first day of school.
  - d. The children drew a picture together on their first day of school.
- (14)
- a. The pilots individually crashed a plane while flying over the Baltic Sea.
  - b. The pilots together crashed a plane while flying over the Baltic Sea.
  - c. The pilots crashed a plane individually while flying over the Baltic Sea.
  - d. The pilots crashed a plane together while flying over the Baltic Sea.
- (15)
- a. The bankrupt managers individually rented a house before they moved to Switzerland.
  - b. The bankrupt managers together rented a house before they moved to Switzerland.
  - c. The bankrupt managers rented a house individually before they moved to Switzerland.
  - d. The bankrupt managers rented a house together before they moved to Switzerland.
- (16)
- a. The forgetful men individually asked a friend when the game was scheduled.
  - b. The forgetful men together asked a friend when the game was scheduled.
  - c. The forgetful men asked a friend individually when the game was scheduled.
  - d. The forgetful men asked a friend together when the game was scheduled.
- (17)
- a. The gourmands individually ate a cake at the festivities at the end of the competition.
  - b. The gourmands together ate a cake at the festivities at the end of the competition.
  - c. The gourmands ate a cake individually at the festivities at the end of the competition.
  - d. The gourmands ate a cake together at the festivities at the end of the competition.
- (18)
- a. The loggers individually walked a mile in a forest near Yosemite National Park.
  - b. The loggers together walked a mile in a forest near Yosemite National Park.
  - c. The loggers walked a mile individually in a forest near Yosemite National Park.
  - d. The loggers walked a mile together in a forest near Yosemite National Park.
- (19)
- a. The devoted employees individually volunteered an hour at their local food bank.
  - b. The devoted employees together volunteered an hour at their local food bank.
  - c. The devoted employees volunteered an hour individually at their local food bank.
  - d. The devoted employees volunteered an hour together at their local food bank.
- (20)
- a. The rising soprano stars individually sang a ballad in front of a cheering crowd.
  - b. The rising soprano stars together sang a ballad in front of a cheering crowd.

- c. The rising soprano stars sang a ballad individually in front of a cheering crowd.
  - d. The rising soprano stars sang a ballad together in front of a cheering crowd.
- (21)
- a. The children individually devoured a sundae after they received perfect grades.
  - b. The children together devoured a sundae after they received perfect grades.
  - c. The children devoured a sundae individually after they received perfect grades.
  - d. The children devoured a sundae together after they received perfect grades.
- (22)
- a. The boys individually ate a grapefruit before their dinner.
  - b. The boys together ate a grapefruit before their dinner.
  - c. The boys ate a grapefruit individually before their dinner.
  - d. The boys ate a grapefruit together before their dinner.
- (23)
- a. The grandmas individually knitted a cap while watching soap operas.
  - b. The grandmas together knitted a cap while watching soap operas.
  - c. The grandmas knitted a cap individually while watching soap operas.
  - d. The grandmas knitted a cap together while watching soap operas.
- (24)
- a. The students individually baked a cake in the school kitchen.
  - b. The students together baked a cake in the school kitchen.
  - c. The students baked a cake individually in the school kitchen.
  - d. The students baked a cake together in the school kitchen.
- (25)
- a. The stockbrokers individually bought a company last week after very lengthy discussions.
  - b. The stockbrokers together bought a company last week after very lengthy discussions.
  - c. The stockbrokers bought a company individually last week after very lengthy discussions.
  - d. The stockbrokers bought a company together last week after very lengthy discussions.
- (26)
- a. The commanders of the regiments individually trained a replacement after their last attack.
  - b. The commanders of the regiments together trained a replacement after their last attack.
  - c. The commanders of the regiments trained a replacement individually after their last attack.
  - d. The commanders of the regiments trained a replacement together after their last attack.
- (27)
- a. The visitors individually left a thank-you gift without letting the hosts know.
  - b. The visitors together left a thank-you gift without letting the hosts know.
  - c. The visitors left a thank-you gift individually without letting the hosts know.
  - d. The visitors left a thank-you gift together without letting the hosts know.
- (28)
- a. The children individually played a memory game while their parents prepared lunch.
  - b. The children together played a memory game while their parents prepared lunch.
  - c. The children played a memory game individually while their parents prepared lunch.
  - d. The children played a memory game together while their parents prepared lunch.

### ***Items of Experiment 2***

- (29)
- a. The students individually read a book when they were at the library.
  - b. The students collectively read a book when they were at the library.
  - c. The students read a book individually when they were at the library.
  - d. The students read a book collectively when they were at the library.
  - e. The students individually read when they were at the library.
  - f. The students collectively read when they were at the library.
  - g. The students read individually when they were at the library.
  - h. The students read collectively when they were at the library.
- (30)
- a. The girls individually wrote a sonnet after they had read Shakespeare.

- b. The girls collectively wrote a sonnet after they had read Shakespeare.
  - c. The girls wrote a sonnet individually after they had read Shakespeare.
  - d. The girls wrote a sonnet collectively after they had read Shakespeare.
  - e. The girls individually wrote after they had read Shakespeare.
  - f. The girls collectively wrote after they had read Shakespeare.
  - g. The girls wrote individually after they had read Shakespeare.
  - h. The girls wrote collectively after they had read Shakespeare.
- (31)
- a. The rich women individually walked a dog after they had eaten dinner.
  - b. The rich women collectively walked a dog after they had eaten dinner.
  - c. The rich women walked a dog individually after they had eaten dinner.
  - d. The rich women walked a dog collectively after they had eaten dinner.
  - e. The rich women individually walked after they had eaten dinner.
  - f. The rich women collectively walked after they had eaten dinner.
  - g. The rich women walked individually after they had eaten dinner.
  - h. The rich women walked collectively after they had eaten dinner.
- (32)
- a. The professors individually graded a paper after their meeting had concluded.
  - b. The professors collectively graded a paper after their meeting had concluded.
  - c. The professors graded a paper individually after their meeting had concluded.
  - d. The professors graded a paper collectively after their meeting had concluded.
  - e. The professors individually graded after their meeting had concluded.
  - f. The professors collectively graded after their meeting had concluded.
  - g. The professors graded individually after their meeting had concluded.
  - h. The professors graded collectively after their meeting had concluded.
- (33)
- a. The boys individually lost a game while playing at the arcade.
  - b. The boys collectively lost a game while playing at the arcade.
  - c. The boys lost a game individually while playing at the arcade.
  - d. The boys lost a game collectively while playing at the arcade.
  - e. The boys individually lost while playing at the arcade.
  - f. The boys collectively lost while playing at the arcade.
  - g. The boys lost individually while playing at the arcade.
  - h. The boys lost collectively while playing at the arcade.
- (34)
- a. The ambitious girls individually won an award during the science fair.
  - b. The ambitious girls collectively won an award during the science fair.
  - c. The ambitious girls won an award individually during the science fair.
  - d. The ambitious girls won an award collectively during the science fair.
  - e. The ambitious girls individually won during the science fair.
  - f. The ambitious girls collectively won during the science fair.
  - g. The ambitious girls won individually during the science fair.
  - h. The ambitious girls won collectively during the science fair.
- (35)
- a. The careless brothers individually paid a price after they angered their boss at work.
  - b. The careless brothers collectively paid a price after they angered their boss at work.
  - c. The careless brothers paid a price individually after they angered their boss at work.
  - d. The careless brothers paid a price collectively after they angered their boss at work.
  - e. The careless brothers individually paid after they angered their boss at work.
  - f. The careless brothers collectively paid after they angered their boss at work.
  - g. The careless brothers paid individually after they angered their boss at work.
  - h. The careless brothers paid collectively after they angered their boss at work.

- (36) a. The volunteers individually cooked a dish for a potluck on Thanksgiving.  
b. The volunteers collectively cooked a dish for a potluck on Thanksgiving.  
c. The volunteers cooked a dish individually for a potluck on Thanksgiving.  
d. The volunteers cooked a dish collectively for a potluck on Thanksgiving.  
e. The volunteers individually cooked for a potluck on Thanksgiving.  
f. The volunteers collectively cooked for a potluck on Thanksgiving.  
g. The volunteers cooked individually for a potluck on Thanksgiving.  
h. The volunteers cooked collectively for a potluck on Thanksgiving.
- (37) a. The coached athletes individually ran a mile before they lifted weights.  
b. The coached athletes collectively ran a mile before they lifted weights.  
c. The coached athletes ran a mile individually before they lifted weights.  
d. The coached athletes ran a mile collectively before they lifted weights.  
e. The coached athletes individually ran before they lifted weights.  
f. The coached athletes collectively ran before they lifted weights.  
g. The coached athletes ran individually before they lifted weights.  
h. The coached athletes ran collectively before they lifted weights.
- (38) a. The women individually sailed a ship from San Francisco to Monterey.  
b. The women collectively sailed a ship from San Francisco to Monterey.  
c. The women sailed a ship individually from San Francisco to Monterey.  
d. The women sailed a ship collectively from San Francisco to Monterey.  
e. The women individually sailed from San Francisco to Monterey.  
f. The women collectively sailed from San Francisco to Monterey.  
g. The women sailed individually from San Francisco to Monterey.  
h. The women sailed collectively from San Francisco to Monterey.
- (39) a. The brothers individually quit a well-paying job after they won the lottery.  
b. The brothers collectively quit a well-paying job after they won the lottery.  
c. The brothers quit a well-paying job individually after they won the lottery.  
d. The brothers quit a well-paying job collectively after they won the lottery.  
e. The brothers individually quit after they won the lottery.  
f. The brothers collectively quit after they won the lottery.  
g. The brothers quit individually after they won the lottery.  
h. The brothers quit collectively after they won the lottery.
- (40) a. The sisters individually painted a masterpiece when they were at school.  
b. The sisters collectively painted a masterpiece when they were at school.  
c. The sisters painted a masterpiece individually when they were at school.  
d. The sisters painted a masterpiece collectively when they were at school.  
e. The sisters individually painted when they were at school.  
f. The sisters collectively painted when they were at school.  
g. The sisters painted individually when they were at school.  
h. The sisters painted collectively when they were at school.
- (41) a. The doctors individually published a book after discovering new healing procedures.  
b. The doctors collectively published a book after discovering new healing procedures.  
c. The doctors published a book individually after discovering new healing procedures.  
d. The doctors published a book collectively after discovering new healing procedures.  
e. The doctors individually published after discovering new healing procedures.  
f. The doctors collectively published after discovering new healing procedures.  
g. The doctors published individually after discovering new healing procedures.  
h. The doctors published collectively after discovering new healing procedures.

- (42) a. The children individually drew a picture on their first day of school.  
b. The children collectively drew a picture on their first day of school.  
c. The children drew a picture individually on their first day of school.  
d. The children drew a picture collectively on their first day of school.  
e. The children individually drew on their first day of school.  
f. The children collectively drew on their first day of school.  
g. The children drew individually on their first day of school.  
h. The children drew collectively on their first day of school.
- (43) a. The pilots individually crashed a plane while flying over the Baltic.  
b. The pilots collectively crashed a plane while flying over the Baltic.  
c. The pilots crashed a plane individually while flying over the Baltic.  
d. The pilots crashed a plane collectively while flying over the Baltic.  
e. The pilots individually crashed while flying over the Baltic.  
f. The pilots collectively crashed while flying over the Baltic.  
g. The pilots crashed individually while flying over the Baltic.  
h. The pilots crashed collectively while flying over the Baltic.
- (44) a. The bankrupt managers individually rented a house before they moved to Switzerland.  
b. The bankrupt managers collectively rented a house before they moved to Switzerland.  
c. The bankrupt managers rented a house individually before they moved to Switzerland.  
d. The bankrupt managers rented a house collectively before they moved to Switzerland.  
e. The bankrupt managers were individually renting before they moved to Switzerland.  
f. The bankrupt managers were collectively renting before they moved to Switzerland.  
g. The bankrupt managers were renting individually before they moved to Switzerland.  
h. The bankrupt managers were renting collectively before they moved to Switzerland.
- (45) a. The forgetful men individually asked a friend when the game was scheduled.  
b. The forgetful men collectively asked a friend when the game was scheduled.  
c. The forgetful men asked a friend individually when the game was scheduled.  
d. The forgetful men asked a friend collectively when the game was scheduled.  
e. The forgetful men individually asked when the game was scheduled.  
f. The forgetful men collectively asked when the game was scheduled.  
g. The forgetful men asked individually when the game was scheduled.  
h. The forgetful men asked collectively when the game was scheduled.
- (46) a. The gourmands collectively ate a cake at the festivities at the end of the competition.  
b. The gourmands ate a cake individually at the festivities at the end of the competition.  
c. The gourmands ate a cake collectively at the festivities at the end of the competition.  
d. The gourmands individually ate at the festivities at the end of the competition.  
e. The gourmands collectively ate at the festivities at the end of the competition.  
f. The gourmands ate individually at the festivities at the end of the competition.  
g. The gourmands ate collectively at the festivities at the end of the competition.
- (47) a. The loggers individually walked a mile in a forest near Yosemite National Park.  
b. The loggers collectively walked a mile in a forest near Yosemite National Park.  
c. The loggers walked a mile individually in a forest near Yosemite National Park.  
d. The loggers walked a mile collectively in a forest near Yosemite National Park.  
e. The loggers individually walked in a forest near Yosemite National Park.  
f. The loggers collectively walked in a forest near Yosemite National Park.  
g. The loggers walked individually in a forest near Yosemite National Park.  
h. The loggers walked collectively in a forest near Yosemite National Park.

- (48) a. The officers individually reported an incident to their commander in chief.  
b. The officers collectively reported an incident to their commander in chief.  
c. The officers reported an incident individually to their commander in chief.  
d. The officers reported an incident collectively to their commander in chief.  
e. The officers individually reported to their commander in chief.  
f. The officers collectively reported to their commander in chief.  
g. The officers reported individually to their commander in chief.  
h. The officers reported collectively to their commander in chief.
- (49) a. The devoted employees individually volunteered an hour at their local food bank.  
b. The devoted employees collectively volunteered an hour at their local food bank.  
c. The devoted employees volunteered an hour individually at their local food bank.  
d. The devoted employees volunteered an hour collectively at their local food bank.  
e. The devoted employees individually volunteered at their local food bank.  
f. The devoted employees collectively volunteered at their local food bank.  
g. The devoted employees volunteered individually at their local food bank.  
h. The devoted employees volunteered collectively at their local food bank.
- (50) a. The rising soprano stars individually sang a ballad in front of a cheering crowd.  
b. The rising soprano stars collectively sang a ballad in front of a cheering crowd.  
c. The rising soprano stars sang a ballad individually in front of a cheering crowd.  
d. The rising soprano stars sang a ballad collectively in front of a cheering crowd.  
e. The rising soprano stars individually sang in front of a cheering crowd.  
f. The rising soprano stars collectively sang in front of a cheering crowd.  
g. The rising soprano stars sang individually in front of a cheering crowd.  
h. The rising soprano stars sang collectively in front of a cheering crowd.
- (51) a. The children individually celebrated with a sundae after they received perfect grades.  
b. The children collectively celebrated with a sundae after they received perfect grades.  
c. The children celebrated with a sundae individually after they received perfect grades.  
d. The children celebrated with a sundae collectively after they received perfect grades.  
e. The children individually celebrated after they received perfect grades.  
f. The children collectively celebrated after they received perfect grades.  
g. The children celebrated individually after they received perfect grades.  
h. The children celebrated collectively after they received perfect grades.
- (52) a. The hungry boys individually ate a grapefruit before their dinner.  
b. The hungry boys collectively ate a grapefruit before their dinner.  
c. The hungry boys ate a grapefruit individually before their dinner.  
d. The hungry boys ate a grapefruit collectively before their dinner.  
e. The hungry boys individually ate before their dinner.  
f. The hungry boys collectively ate before their dinner.  
g. The hungry boys ate individually before their dinner.  
h. The hungry boys ate collectively before their dinner.
- (53) a. The grandmas individually knitted a cap while watching soap operas.  
b. The grandmas collectively knitted a cap while watching soap operas.  
c. The grandmas knitted a cap individually while watching soap operas.  
d. The grandmas knitted a cap collectively while watching soap operas.  
e. The grandmas individually knitted while watching soap operas.  
f. The grandmas collectively knitted while watching soap operas.  
g. The grandmas knitted individually while watching soap operas.  
h. The grandmas knitted collectively while watching soap operas.

- (54) a. The students individually baked a cake in the school kitchen.  
b. The students collectively baked a cake in the school kitchen.  
c. The students baked a cake individually in the school kitchen.  
d. The students baked a cake collectively in the school kitchen.  
e. The students individually baked in the school kitchen.  
f. The students collectively baked in the school kitchen.  
g. The students baked individually in the school kitchen.  
h. The students baked collectively in the school kitchen.
- (55) a. The stockbrokers individually bought a share last week after very lengthy discussions.  
b. The stockbrokers collectively bought a share last week after very lengthy discussions.  
c. The stockbrokers bought a share individually last week after very lengthy discussions.  
d. The stockbrokers bought a share collectively last week after very lengthy discussions.  
e. The stockbrokers were individually investing last week after very lengthy discussions.  
f. The stockbrokers were collectively investing last week after very lengthy discussions.  
g. The stockbrokers were investing individually last week after very lengthy discussions.  
h. The stockbrokers were investing collectively last week after very lengthy discussions.
- (56) a. The commanders of the regiments individually trained a replacement after their last attack.  
b. The commanders of the regiments collectively trained a replacement after their last attack.  
c. The commanders of the regiments trained a replacement individually after their last attack.  
d. The commanders of the regiments trained a replacement collectively after their last attack.  
e. The commanders of the regiments individually trained after their last attack.  
f. The commanders of the regiments collectively trained after their last attack.  
g. The commanders of the regiments trained individually after their last attack.  
h. The commanders of the regiments trained collectively after their last attack.
- (57) a. The visitors individually left a thank-you gift without letting the hosts know.  
b. The visitors collectively left a thank-you gift without letting the hosts know.  
c. The visitors left a thank-you gift individually without letting the hosts know.  
d. The visitors left a thank-you gift collectively without letting the hosts know.  
e. The visitors individually left without letting the hosts know.  
f. The visitors collectively left without letting the hosts know.  
g. The visitors left individually without letting the hosts know.  
h. The visitors left collectively without letting the hosts know.
- (58) a. The children individually played a memory game while their parents prepared lunch.  
b. The children collectively played a memory game while their parents prepared lunch.  
c. The children played a memory game individually while their parents prepared lunch.  
d. The children played a memory game collectively while their parents prepared lunch.  
e. The children individually played while their parents prepared lunch.  
f. The children collectively played while their parents prepared lunch.  
g. The children played individually while their parents prepared lunch.  
h. The children played collectively while their parents prepared lunch.
- (59) a. The prisoners individually waited a full month to get the results of their drug test.  
b. The prisoners collectively waited a full month to get the results of their drug test.  
c. The prisoners waited a full month individually to get the results of their drug test.  
d. The prisoners waited a full month collectively to get the results of their drug test.  
e. The prisoners individually waited to get the results of their drug test.  
f. The prisoners collectively waited to get the results of their drug test.  
g. The prisoners waited individually to get the results of their drug test.  
h. The prisoners waited collectively to get the results of their drug test.

- (60)
- The East Asian currencies individually climbed a full percent in the first hour of trading.
  - The East Asian currencies collectively climbed a full percent in the first hour of trading.
  - The East Asian currencies climbed a full percent individually in the first hour of trading.
  - The East Asian currencies climbed a full percent collectively in the first hour of trading.
  - The East Asian currencies individually climbed in the first hour of trading.
  - The East Asian currencies collectively climbed in the first hour of trading.
  - The East Asian currencies climbed individually in the first hour of trading.
  - The East Asian currencies climbed collectively in the first hour of trading.

### **Prior structure and sampling details for the Bayesian models**

For each model of reading times, we specified the following low information priors, following practical considerations discussed in [Schad et al. \(2019\)](#):<sup>1</sup>

- Intercept: Normal( $\mu = 0, \sigma = 2$ )
- Fixed effects: Normal( $\mu = 0, \sigma = 2$ )
- All standard deviations for random effects: Normal( $\mu = 0, \sigma = 2$ ), truncated at 0

A normal distribution prior for the fixed effects with a mean of 0 assumes that, before seeing the data, our fixed effects are likely to play no role. We also specify a relatively large standard deviation for these priors ( $\sigma = 2$ ), which makes the model fairly agnostic with respect to the range of possible fixed-effect values. The same reasoning applies to the intercept and random effects.

The No U-Turn Sampler (NUTS) was used to sample from the posterior distributions of the parameters (3 chains of 2,500 iterations each). The chains for all the reported parameters had an  $\hat{R} < 1.01$ .<sup>2</sup>

For the acceptability study, we assumed the following prior structure for the Bayesian model:

- Intercept: Normal( $\mu = 0, \sigma = 5$ )
- Fixed effects: Normal( $\mu = 0, \sigma = 5$ )
- All standard deviations for random effects: Normal( $\mu = 0, \sigma = 5$ ), truncated at 0

We used NUTS to sample from the posterior distributions: 4 chains of 5,000 iterations each. The chains for all the reported parameters had an  $\hat{R} < 1.01$ .

### **Descriptive summary of Exp. 1**

We report mean logRTs and SEs per word and condition.

| adverb       | disambiguation | LogRT | SEs   | word        |
|--------------|----------------|-------|-------|-------------|
| together     | early          | 6.137 | 0.021 | AdverbEarly |
| individually | early          | 6.146 | 0.020 | AdverbEarly |
| together     | early          | 6.138 | 0.020 | wrote       |
| together     | late           | 6.133 | 0.019 | wrote       |
| individually | early          | 6.157 | 0.019 | wrote       |
| individually | late           | 6.121 | 0.020 | wrote       |
| together     | early          | 6.009 | 0.015 | a           |
| together     | late           | 6.019 | 0.016 | a           |
| individually | early          | 6.024 | 0.016 | a           |
| individually | late           | 6.001 | 0.016 | a           |
| together     | early          | 6.057 | 0.020 | sonnet      |
| together     | late           | 6.028 | 0.018 | sonnet      |
| individually | early          | 6.083 | 0.021 | sonnet      |
| individually | late           | 6.061 | 0.021 | sonnet      |

<sup>1</sup> All other priors were kept at the default values used by `brms`.

<sup>2</sup> We also estimated mixed-effects models using LogRTs as the dependent variable instead of residualized LogRTs. Aside from the fixed effects testing the experimental manipulation (i.e., the type of disambiguation adverb, the position of the adverb, and the presence/absence of the object in Exp. 2), these models had two other fixed effects: word length (measured in number of characters) and sentential word position. These models had the same prior structure as the models for residualized logRTs, except for a Normal( $\mu = 6, \sigma = 2$ ) prior for the intercepts (the mean of 6 on log scale corresponds to a reading time of  $\approx 400$  ms per word). These models did not paint a different picture from the models that used residualized LogRTs, so we do not discuss them here in any more detail.

|              |       |       |       |            |
|--------------|-------|-------|-------|------------|
| together     | late  | 6.076 | 0.019 | AdverbLate |
| individually | late  | 6.142 | 0.021 | AdverbLate |
| together     | early | 6.034 | 0.017 | after      |
| together     | late  | 6.072 | 0.018 | after      |
| individually | early | 6.035 | 0.017 | after      |
| individually | late  | 6.139 | 0.020 | after      |
| together     | early | 5.995 | 0.017 | they       |
| together     | late  | 5.992 | 0.016 | they       |
| individually | early | 6.003 | 0.017 | they       |
| individually | late  | 6.043 | 0.016 | they       |
| together     | early | 6.009 | 0.017 | had        |
| together     | late  | 6.024 | 0.018 | had        |
| individually | early | 6.006 | 0.017 | had        |
| individually | late  | 6.026 | 0.017 | had        |

**Table 1:** Experiment 1: Means and SEs of logRTs per word..

### **Descriptive summary of Exp. 2**

We report mean logRTs and SEs per word and condition.

| adverb       | disambiguation | object | LogRT | SEs   | word        |
|--------------|----------------|--------|-------|-------|-------------|
| collectively | early          | null   | 5.949 | 0.031 | AdverbEarly |
| collectively | early          | object | 5.954 | 0.033 | AdverbEarly |
| individually | early          | null   | 5.985 | 0.034 | AdverbEarly |
| individually | early          | object | 5.997 | 0.031 | AdverbEarly |
| collectively | early          | null   | 5.946 | 0.027 | won         |
| collectively | early          | object | 5.967 | 0.030 | won         |
| collectively | late           | null   | 5.943 | 0.029 | won         |
| collectively | late           | object | 5.945 | 0.028 | won         |
| individually | early          | null   | 5.990 | 0.028 | won         |
| individually | early          | object | 6.011 | 0.028 | won         |
| individually | late           | null   | 5.898 | 0.030 | won         |
| individually | late           | object | 5.977 | 0.034 | won         |
| collectively | early          | object | 5.903 | 0.025 | an          |
| collectively | late           | object | 5.839 | 0.026 | an          |
| individually | early          | object | 5.904 | 0.024 | an          |
| individually | late           | object | 5.857 | 0.024 | an          |
| collectively | early          | object | 5.835 | 0.028 | award       |
| collectively | late           | object | 5.820 | 0.027 | award       |
| individually | early          | object | 5.873 | 0.028 | award       |
| individually | late           | object | 5.863 | 0.031 | award       |
| collectively | late           | null   | 6.031 | 0.035 | AdverbLate  |
| collectively | late           | object | 5.969 | 0.035 | AdverbLate  |
| individually | late           | null   | 5.935 | 0.031 | AdverbLate  |
| individually | late           | object | 5.963 | 0.036 | AdverbLate  |
| collectively | early          | null   | 5.910 | 0.027 | during      |
| collectively | early          | object | 5.884 | 0.031 | during      |
| collectively | late           | null   | 5.997 | 0.028 | during      |
| collectively | late           | object | 5.972 | 0.031 | during      |
| individually | early          | null   | 5.944 | 0.026 | during      |
| individually | early          | object | 5.895 | 0.028 | during      |
| individually | late           | null   | 5.989 | 0.033 | during      |
| individually | late           | object | 6.013 | 0.036 | during      |
| collectively | early          | null   | 5.909 | 0.027 | the         |
| collectively | early          | object | 5.839 | 0.024 | the         |
| collectively | late           | null   | 5.867 | 0.025 | the         |
| collectively | late           | object | 5.862 | 0.027 | the         |
| individually | early          | null   | 5.885 | 0.022 | the         |

|              |       |        |       |       |         |
|--------------|-------|--------|-------|-------|---------|
| individually | early | object | 5.830 | 0.023 | the     |
| individually | late  | null   | 5.868 | 0.026 | the     |
| individually | late  | object | 5.839 | 0.027 | the     |
| collectively | early | null   | 5.830 | 0.023 | science |
| collectively | early | object | 5.834 | 0.027 | science |
| collectively | late  | null   | 5.858 | 0.027 | science |
| collectively | late  | object | 5.800 | 0.024 | science |
| individually | early | null   | 5.879 | 0.027 | science |
| individually | early | object | 5.825 | 0.027 | science |
| individually | late  | null   | 5.792 | 0.025 | science |
| individually | late  | object | 5.866 | 0.030 | science |

**Table 2:** Experiment 2: Means and SEs of logRTs per word..

## References

Schad, Daniel J., Michael Betancourt, and Shravan Vasishth. 2019. Toward a principled bayesian workflow in cognitive science. ArXiv: 1904.12765.