

Appendices

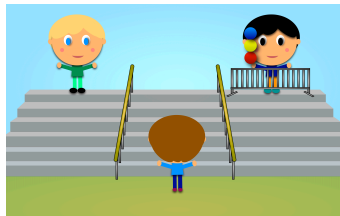
A Instructions

A.1 Truth Value Judgment Task instructions

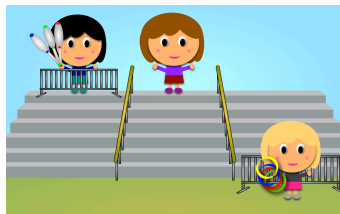
Instructions

In this experiment, you will see cartoon images of characters who are about to do something.

In the first picture below, for example, the boy at the top left will go down the stairs. The boy at the bottom of the staircase will go up the stairs. The boy at the top right will not go down the stairs, since his path is blocked by a barrier. Instead, this boy will practice his juggling!

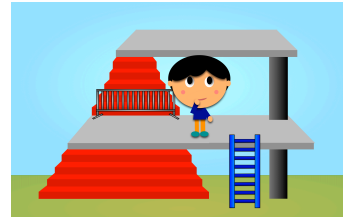
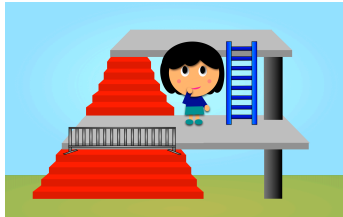


In the next picture, the girl at the top left and the girl at the bottom right will not use the stairs, since their respective paths are blocked by barriers. Instead, they'll practice their juggling. The girl in the middle will go down the stairs.



Sometimes, the characters may have more than one option, as in the two pictures below. The girl on the left is blocked from going down the stairs, but she can go up the stairs or take the ladder up. The boy on the

right is blocked from going up the stairs, but he can go down the stairs or take the ladder down.



With these rules in mind, someone was given such pictures and was asked to describe them. You will see videos of her descriptions, accompanied by one picture at a time. Your task is to decide whether the picture you see matches the speaker's description. Sometimes the answer will be clear. Other times, it will be difficult to decide. Simply answer as best as you can, by clicking on 'Yes' or 'No'.

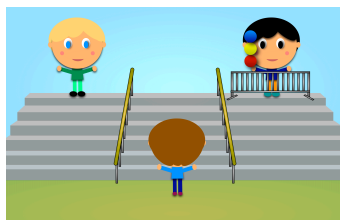
Click below to begin the experiment.

A.2 Picture Selection Task instructions

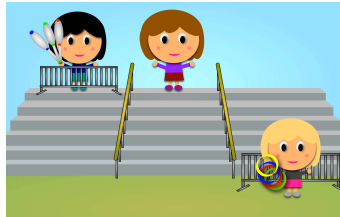
Instructions

In this experiment, you will see cartoon images of characters who are about to do something.

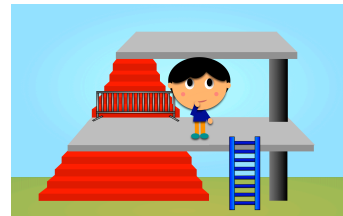
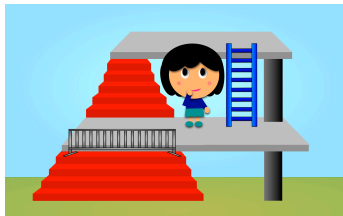
In the first picture below, for example, the boy at the top left will go down the stairs. The boy at the bottom of the staircase will go up the stairs. The boy at the top right will not go down the stairs, since his path is blocked by a barrier. Instead, this boy will practice his juggling!



In the next picture, the girl at the top left and the girl at the bottom right will not use the stairs, since their respective paths are blocked by barriers. Instead, they'll practice their juggling. The girl in the middle will go down the stairs.



Sometimes, the characters may have more than one option, as in the two pictures below. The girl on the left is blocked from going down the stairs, but she can go up the stairs or take the ladder up. The boy on the right is blocked from going up the stairs, but he can go down the stairs or take the ladder down.



With these rules in mind, someone was given such pictures and was asked to describe them. You will see videos of her descriptions, accompanied by two pictures at a time. Your task is to decide which of the two pictures she was talking about. Sometimes the choice will be clear. Other times, it will be difficult to choose between the two pictures. Simply choose the best option you can in all cases, by clicking on the picture of your choice.

Click below to begin the experiment.

B Test sentences

This appendix provides the list of test sentences that appeared in the two experiments.

B.1 Unembedded

- (37) GESTURE condition
- a. The girl will [use the stairs]_UP
 - b. The girl will use the stairs]_DOWN
 - c. The boy will [use the stairs]_UP
 - d. The boy will [use the stairs]_DOWN
- (38) ASSERTED condition
- a. The girl will use the stairs [in this direction]_UP
 - b. The girl will use the stairs [in this direction]_DOWN
 - c. The boy will use the stairs [in this direction]_UP
 - d. The boy will use the stairs [in this direction]_DOWN

B.2 Might

- (39) GESTURE condition
- a. The girl might [use the stairs]_UP
 - b. The girl might use the stairs]_DOWN
 - c. The boy might [use the stairs]_UP
 - d. The boy might [use the stairs]_DOWN
- (40) ASSERTED condition
- a. The girl might use the stairs [in this direction]_UP
 - b. The girl might use the stairs [in this direction]_DOWN
 - c. The boy might use the stairs [in this direction]_UP
 - d. The boy might use the stairs [in this direction]_DOWN

B.3 Negation

- (41) GESTURE condition
- a. The girl will not [use the stairs]_UP
 - b. The girl will not use the stairs]_DOWN
 - c. The boy will not [use the stairs]_UP
 - d. The boy will not [use the stairs]_DOWN

- (42) ASSERTED condition
- a. The girl will not use the stairs [in this direction]_UP
 - b. The girl will not use the stairs [in this direction]_DOWN
 - c. The boy will not use the stairs [in this direction]_UP
 - d. The boy will not use the stairs [in this direction]_DOWN

B.4 Each

- (43) GESTURE condition
- a. Each of these three girls will [use the stairs]_UP
 - b. Each of these three girls will use the stairs]_DOWN
 - c. Each of these three boys will [use the stairs]_UP
 - d. Each of these three boys will [use the stairs]_DOWN
- (44) ASSERTED condition
- a. Each of these three girls will use the stairs [in this direction]_UP
 - b. Each of these three girls will use the stairs [in this direction]_DOWN
 - c. Each of these three boys will use the stairs [in this direction]_UP
 - d. Each of these three boys will use the stairs [in this direction]_DOWN

B.5 None

- (45) GESTURE condition
- a. None of these three girls will [use the stairs]_UP
 - b. None of these three girls will use the stairs]_DOWN
 - c. None of these three boys will [use the stairs]_UP
 - d. None of these three boys will [use the stairs]_DOWN
- (46) ASSERTED condition
- a. None of these three girls will use the stairs [in this direction]_UP
 - b. None of these three girls will use the stairs [in this direction]_DOWN
 - c. None of these three boys will use the stairs [in this direction]_UP
 - d. None of these three boys will use the stairs [in this direction]_DOWN

B.6 Exactly one

- (47) GESTURE condition
- a. Exactly one of these three girls will [use the stairs]_UP
 - b. Exactly one of these three girls will use the stairs]_DOWN
 - c. Exactly one of these three boys will [use the stairs]_UP

- d. Exactly one of these three boys will [use the stairs]_DOWN
- (48) ASSERTED condition
 - a. Exactly one of these three girls will use the stairs [in this direction]_UP
 - b. Exactly one of these three girls will use the stairs [in this direction]_DOWN
 - c. Exactly one of these three boys will use the stairs [in this direction]_UP
 - d. Exactly one of these three boys will use the stairs [in this direction]_DOWN

B.7 No-gesture controls

- (49) a. The girl will use the stairs
- b. The boy will use the stairs

B.8 Non-path gesture controls

- (50) a. The girl will [go down]_SLIDE
- b. The boy will [go down]_SLIDE
- (51) a. The girl will [go up]_LADDER
- b. The boy will [go up]_LADDER
- (52) a. The girl will [go up]_STAIRS
- b. The boy will [go up]_STAIRS
- (53) a. The girl will [go up]_ROPE
- b. The boy will [go up]_ROPE

C Readings and relevant images for each linguistic environment

This appendix details the possible interpretation strategies and readings for the test sentences in each environment.

C.1 Unembedded

The sentence in (54a) could be interpreted as in the paraphrases in (54b) or (54c), depending on whether participants *ignore* the contribution of the directional gesture, or instead *integrate* the directional inference.

- (54) a. The boy will [use the stairs]_UP
(ASSERTED control: The boy will use the stairs [in this direction]_UP)
- b. **Ignore directional inference:** The boy will use the stairs.
- c. **Integrate directional inference:** The boy will use the stairs in an upwards direction.

To detect for the availability of the Ignore and Integrate interpretation strategies, we created images that varied in whether they would make the target sentence true on each of these interpretation strategies. Figure 15 provides the target images accompanying the test sentences, and Table 4 provides the expected truth values for the target sentences when accompanied by each of the target pictures, according to each of the possible interpretation strategies.

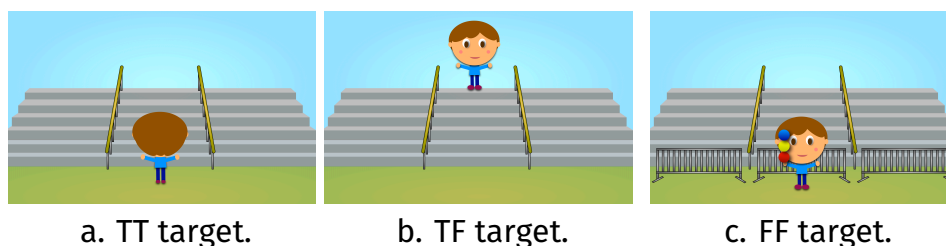


Figure 15: UNEMBEDDED target images accompanying the description “The boy will [use the stairs]_UP” / “The boy will use the stairs [in this direction]_UP”. The TT target was true on both Ignore and Integrate readings; the TF target was true on the Ignore but false on the Integrate reading; the FF target was false on both readings.

C.2 Might

The sentence in (55a) could be interpreted as in the paraphrases in (55b) or (55c), depending on whether participants *ignore* the contribution of the directional gesture, or instead *project* the directional inference.

Interpretation strategy	<i>Target pictures</i>		
	TT	TF	FF
Ignore directional inference	1	1	0
Integrate directional inference	1	0	0

Table 4: Possible interpretation strategies in the UNEMBEDDED environment, and the corresponding truth values for the target sentences, when accompanied by each of the target pictures.

- (55) a. The girl might [use the stairs]_UP
(ASSERTED control: The girl might use the stairs [in this direction]_UP)
- b. **Ignore directional inference:** The girl might use the stairs.
- c. **Project directional inference:** The girl might use the stairs, and if she does it will be in an upwards direction.

To detect for the availability of the Ignore and Project interpretation strategies, we created images that varied in whether they would make the target sentence true on each of these interpretation strategies. Figure 16 provides example target images accompanying the test sentences, and Table 5 provides the expected truth values for the target sentences when accompanied by each of the target pictures, according to each of the possible interpretation strategies.

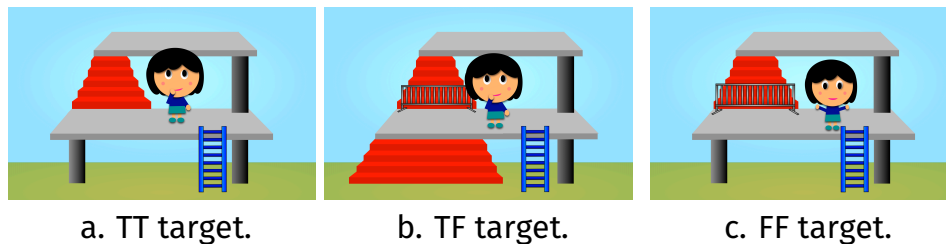


Figure 16: MIGHT target images accompanying the description “The girl might [use the stairs]_UP” / “The girl might use the stairs [in this direction]_UP”. The TT target was true on both Ignore and Project readings; the TF target was true on the Ignore but false on the Project reading; the FF target was false on both readings.

Interpretation strategy	<i>Target pictures</i>		
	TT	TF	FF
Ignore directional inference	1	1	0
Project directional inference	1	0	0

Table 5: Possible interpretation strategies in the MIGHT environment, and the corresponding truth values for the target sentences, when accompanied by each of the target pictures.

C.3 Negation

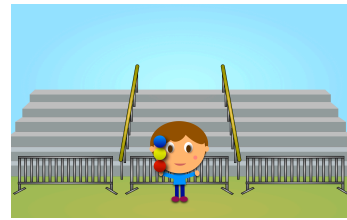
The sentence in (56a) could be interpreted as in the paraphrases in (56b), (56c), or (56d), depending on whether participants *ignore* the contribution of the directional gesture, *project* the directional inference through negation, or *locally accommodate* the inference.

- (56) a. The boy will not [use the stairs]_UP
(ASSERTED control: The boy will not use the stairs [in this direction]_UP)
- b. **Ignore directional inference:** The boy will not use the stairs.
- c. **Project directional inference:** The boy will not use the stairs, but if he did it would be in an upwards direction.
- d. **Locally accommodate directional inference:** The boy will not use the stairs in an upwards direction.

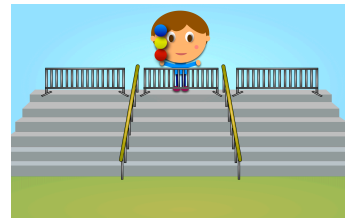
To detect for the availability of the Ignore, Project, and Locally Accommodate interpretation strategies, we created images that varied in whether they would make the target sentence true on each of these interpretation strategies. Figure 17 provides example target images accompanying the test sentences, and Table 6 provides the expected truth values for the target sentences when accompanied by each of the target pictures, according to each of the possible interpretation strategies.

C.4 Each

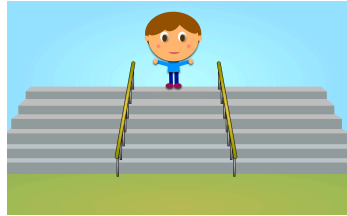
See main text.



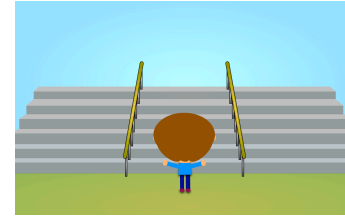
a. TTT target.



b. TFT target.



c. FFT target.



d. FFF target.

Figure 17: NEGATION target images accompanying the description “The boy will not [use the stairs]_UP” / “The boy will not use the stairs [in this direction]_UP”. The TTT target was true on all readings; the TFT target was false only on the Project reading; the FFT target was only true on the Locally Accommodate reading; the FFF target was false on all readings.

Interpretation strategy	Target pictures			
	TTT	TFT	FFT	FFF
Ignore directional inference	1	1	0	0
Project directional inference	1	0	0	0
Locally accommodate directional inference	1	1	1	0

Table 6: Possible interpretation strategies in the NEGATION environment, and the corresponding truth values for the target sentences, when accompanied by each of the target pictures.

C.5 None

The sentence in (57a) could be interpreted as in the paraphrases in (57b), (57c), (57d), or (57e) depending on whether participants *ignore* the contribution of the directional gesture, *existentially project* the directional inference from under the quantifier “none”, *universally project* the inference from “none”, or *locally accommodate* the directional inference.

- (57) a. None of these three girls will [use the stairs]_UP
(ASSERTED control: None of these three girls will use the stairs [in this direction]_UP)
- b. **Ignore inference:** None of the girls will use the stairs.
- c. **Existentially project directional inference:** None of the girls will use the stairs, but for at least one of the girls, if she used the stairs it would be in an upwards direction.
- d. **Universally project directional inference:** None of the girls will use the stairs, but for each of the girls, if she used the stairs it would be in an upwards direction.
- e. **Locally accommodate directional inference:** None of the girls will use the stairs in an upwards direction.

To detect for the availability of the Ignore, Existentially Project, Universally Project, and Locally Accommodate interpretation strategies, we created images that varied in whether they would make the target sentence true on each of these interpretation strategies. Figure 18 provides example target images accompanying the test sentences, and Table 7 provides the expected truth values for the target sentences when accompanied by each of the target pictures, according to each of the possible interpretation strategies.

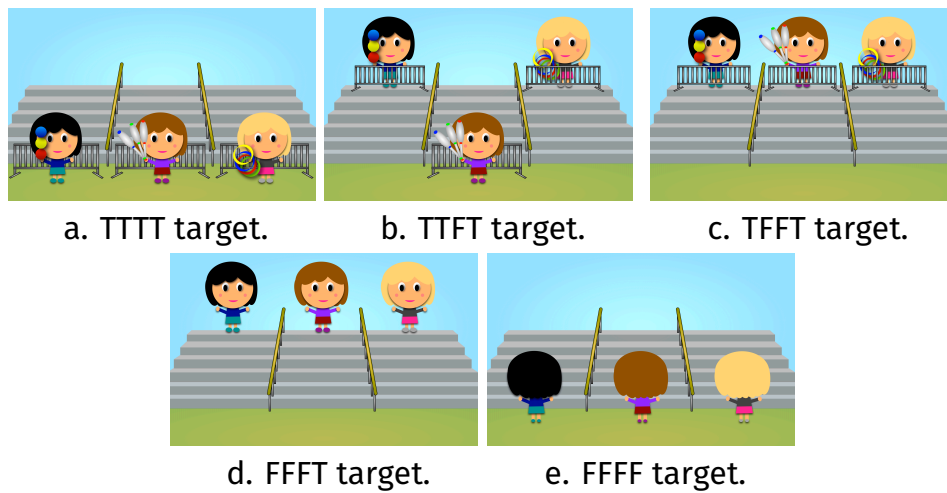


Figure 18: NONE target images accompanying the description “None of these three girls will [use the stairs]_{UP}” / “None of these three girls will use the stairs [in this direction]_{UP}”. The TTTT target was true on all readings; the TTFT target was false only on the Universally Project reading; the TFFT target was false on both the Existentially Project and Universally Project readings; the FFFT target was true only on the Locally Accommodate reading; the FFFF was false on all readings.

Interpretation	<i>Target pictures</i>				
	TTTT	TTFT	TFFT	FFFT	FFFF
Ignore directional inference	1	1	1	0	0
Existentially project directional inference	1	1	0	0	0
Universally project directional inference	1	0	0	0	0
Locally accommodate directional inference	1	1	1	1	0

Table 7: Possible interpretation strategies in the NONE environment, and the corresponding truth values for the target sentences, when accompanied by each of the target pictures.

C.6 Exactly one

The sentence in (58a) could be interpreted as in the paraphrases in (58b), (58c), (58d), or (58e) depending on whether participants *ignore* the contribution of the directional gesture, *existentially project* the directional inference from under the quantifier “exactly-one”, *universally project* the inference from “exactly-one”, or *locally accommodate* the directional inference.

- (58)
- a. Exactly one of these three boys will [use the stairs]_UP
(ASSERTED control: Exactly one of these three boys will use the stairs [in this direction]_UP)
 - b. **Ignore inference:** Exactly one of the boys will use the stairs.
 - c. **Existentially project directional inference:** Exactly one of the boys will use the stairs, and for at least one of the boys, if he were to use the stairs it would be in an upwards direction.
 - d. **Universally project directional inference:** Exactly one of the boys will use the stairs, and for each of the boys, if he were to use the stairs it would be in an upwards direction.
 - e. **Locally accommodate directional inference:** Exactly one of the boys will use the stairs in an upwards direction.

To detect for the availability of the Ignore, Existentially Project, Universally Project, and Locally Accommodate interpretation strategies, we created images that varied in whether they would make the target sentence true on each of these interpretation strategies. Figure 19 provides example target images accompanying the test sentences, and Table 8 provides the expected truth values for the target sentences when accompanied by each of the target pictures, according to each of the possible interpretation strategies.

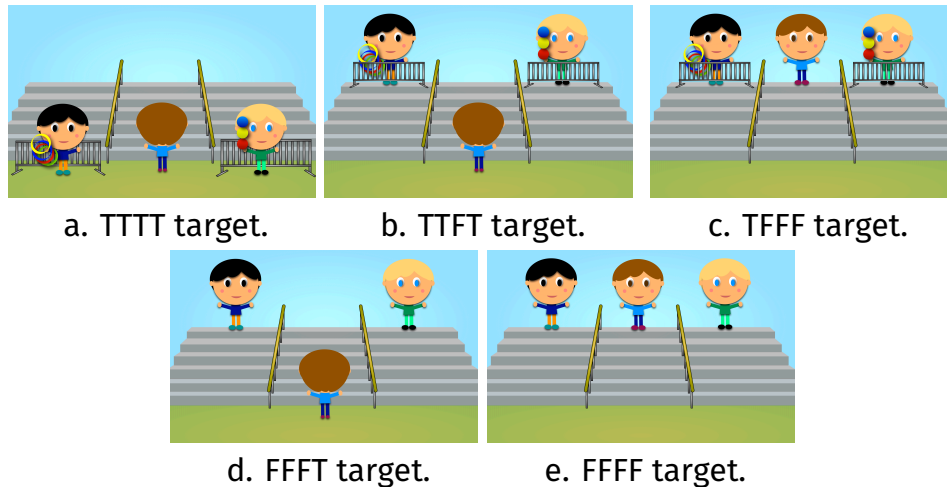


Figure 19: EXACTLY-ONE target images accompanying the description “Exactly one of these three boys will [use the stairs]_UP” / “Exactly one of these three boys will use the stairs [in this direction]_UP”. The TTTT target was true on all readings; the TTFT target was false only on the Universally Project reading; the TFFF target was false on the Universally Project and Existentially Project (and consequently the Locally Accommodate) readings; the FFFT target was true only on the Locally Accommodate reading; the FFFF target was false on all readings. Note that the FFFT target could also be considered true on the Existentially Project reading on the assumption that presuppositions contribute to the at-issue component of meaning, with exactly one of the three boys going up the stairs (with the *up* direction being contributed by the cosupposition *qua* part of the at-issue component); in this case, the FFFT target would more accurately be labelled as FTFT.

Interpretation strategy	<i>Target pictures</i>				
	TTTT	TTFT	TFFF	FFFT	FFFF
Ignore inference	1	1	1	0	0
Existentially project directional inference	1	1	0	0	0
Universally project directional inference	1	0	0	0	0
Locally accommodate directional inference	1	1	0	1	0

Table 8: Possible interpretation strategies in the EXACTLY-ONE environment, and the corresponding truth values for the target sentences, when accompanied by each of the target pictures.

D Experiment 1: Results by environment

This appendix provides the details of the statistical analyses for each environment.

D.1 Experiment 1: Results for UNEMBEDDED conditions

We fitted logistic regression models to the responses to the GESTURE and ASSERTED targets, as in (59) and (60). We did not include random intercepts for Participant or Item, as each participant saw only one repetition of each target (and each item effectively corresponded to a target).

(59) `glm(response ~ 1 + Ignore + Integrate, family="binomial", data=tv_unem_gest)`

(60) `glm(response ~ 1 + Ignore + Integrate, family="binomial", data=tv_unem_asrt)`

For each condition (i.e. the GESTURE and the ASSERTED conditions), we compared the models with and without each of the target readings. The comparisons revealed significant effects of both Ignore and Integrate, indicating that both interpretation strategies were available for both the GESTURE and the ASSERTED versions of the sentences. Table 9 displays the results of the model comparisons.

To determine if the Ignore and Integrate strategies were available to different degrees for the GESTURE and the ASSERTED targets, we fitted a logit model to the GESTURE and ASSERTED responses together (using contrast coding, recoding GESTURE as $-.5$ and ASSERTED as $+.5$). The model that included random intercepts for participants did not converge, so the random effects were dropped, as in (61). Comparisons of the models with and without each of the interaction terms revealed a significant interaction between Condition and Ignore ($\chi^2(1) = 11.3, p < .001$) and between Condition and Integrate ($\chi^2(1) = 8.26, p < .01$), suggesting participants were more inclined to ignore the directional inference in the GESTURE condition, and more willing to integrate the inference in the ASSERTED condition.

(61) `glm(response ~ 1 + Ignore + Integrate + Condition + Ignore:Condition + Integrate:Condition, family="binomial", data=tv_unem)`

D.2 Experiment 1: Results for MIGHT conditions

We fitted logistic regression models to the responses to the GESTURE and ASSERTED targets, as in (62) and (63). We did not include random intercepts

for Participant or Item, as each participant saw only one repetition of each target (and each item effectively corresponded to a target).

```
(62) glm(response ~ 1 + Ignore + Project, family="binomial", data=tv_might_gest)
```

```
(63) glm(response ~ 1 + Ignore + Project, family="binomial", data=tv_might_asrt)
```

For each condition (i.e. the GESTURE and the ASSERTED conditions), we compared the models with and without each of the target readings. The comparisons revealed main effects of Ignore and Project in the GESTURE condition but only a main effect of Project in the ASSERTED condition, indicating that Ignore and Project were available interpretation strategies for the GESTURE sentences, and Project was an available strategy for the ASSERTED sentences. Table 10 displays the results of the model comparisons.

To determine if the Ignore and Project strategies were available to different degrees for the GESTURE and the ASSERTED targets, we fitted a logit model to the GESTURE and ASSERTED responses together (using contrast coding, recoding GESTURE as -.5 and ASSERTED as +.5). The model that included random intercepts for participants did not converge, so the random effects were dropped, as in (64). A comparison of the models with and without each of the interaction terms revealed no significant interactions between Condition and Ignore or between Condition and Project (both $p > .05$), suggesting neither strategy was more available in one condition than the other.

```
(64) glm(response ~ 1 + Ignore + Project + Condition + Ignore:Condition +
      Project:Condition, family="binomial", data=tv_might)
```

D.3 Experiment 1: Results for NEGATION conditions

We fitted logistic regression models to the responses to the GESTURE and ASSERTED targets, as in (65) and (66). We did not include random intercepts for Participant or Item, as each participant saw only one repetition of each target (and each item effectively corresponded to a target).

```
(65) glm(response~1 + Ignore + Project + LocalAccommodate, family="binomial",
      data=tv_neg_gest)
```

```
(66) glm(response~1 + Ignore + Project + LocalAccommodate, family="binomial",
      data=tv_neg_asrt)
```

For each condition (i.e. the GESTURE and the ASSERTED conditions), we compared the models with and without each of the target readings. The

comparisons revealed significant main effects of all three interpretation strategies in the GESTURE condition, and significant main effects of Project and Locally Accommodate but not of Ignore in the ASSERTED condition, indicating that Ignore, Project, and Locally Accommodate were available interpretation strategies for the GESTURE sentences, and Project and Locally Accommodate were available strategies for the ASSERTED targets. Table 11 displays the results of the model comparisons.

To determine if the Ignore, Project, and Locally Accommodate strategies were available to different degrees for the GESTURE and the ASSERTED targets, we fitted a logit model to the GESTURE and ASSERTED responses together (using contrast coding, recoding GESTURE as -.5 and ASSERTED as +.5). The model that included random intercepts for participants did not converge, so the random effects were dropped, as in (67). A comparison of the models with and without each of the interaction terms revealed significant interactions between Condition and Ignore ($\chi^2(1) = 12.3, p < .001$) and between Condition and Locally Accommodate ($\chi^2(1) = 13.8, p < .001$), but no significant interaction between Condition and Project ($p > .05$), suggesting that Ignore and Locally Accommodate, but not Project, were available to different degrees in the two conditions. Indeed, the confidence intervals of the estimated weights indicate that participants were more inclined to ignore the directional inference in the GESTURE condition, and more willing to locally accommodate the inference in the ASSERTED condition.

```
(67) glm(response ~ 1 + Ignore + Project + LocalAccommodate + Condition
      + Ignore:Condition + Project:Condition + LocalAccommodate:Condition,
      family="binomial", data=tv_neg)
```

D.4 Experiment 1: Results for EACH conditions

We fitted logistic regression models to the responses to the GESTURE and ASSERTED targets, as in (68) and (69). We did not include random intercepts for Participant or Item, as each participant saw only one repetition of each target (and each item effectively corresponded to a target).

```
(68) glm(response ~ 1 + Ignore + ExiProject + UniProject, family="binomial",
      data=tv_each_gest)
```

```
(69) glm(response ~ 1 + Ignore + ExiProject + UniProject, family="binomial",
      data=tv_each_asrt)
```

For each condition (i.e. the GESTURE and the ASSERTED conditions), we compared the models with and without each of the target readings. The

comparisons revealed significant main effects of all three interpretation strategies in the GESTURE condition, but only of Universally Project in the ASSERTED condition, indicating that Ignore, Existentially Project, and Universally Project were available interpretation strategies for the GESTURE sentences, while Universally Project was an available strategy for the ASSERTED targets. Table 12 displays the results of the model comparisons.

To determine if the Ignore, Existentially Project, and Universally Project strategies were available to different degrees for the GESTURE and the ASSERTED targets, we fitted a logit model to the GESTURE and ASSERTED responses together (using contrast coding, recoding GESTURE as $-.5$ and ASSERTED as $+.5$). The model that included random intercepts for participants did not converge, so the random effects were dropped, as in (70). A comparison of the models with and without each of the interaction terms revealed a significant interaction between Condition and Ignore ($\chi^2(1) = 11.8, p < .001$), but no significant interactions between Condition and Existentially Project or between Condition and Universally Project (both $p > .05$), suggesting that Ignore, but neither existential nor universal projection, was available to different degrees in the two conditions. Indeed, the confidence intervals of the estimated weights indicate that participants were more inclined to ignore the directional inference in the GESTURE condition.

(70) `glm(response ~ 1 + Ignore + ExiProject + UniProject + Condition + Ignore:Condition + ExiProject:Condition + UniProject:Condition, family="binomial", data=tv_each)`

D.5 Experiment 1: Results for NONE conditions

We fitted logistic regression models to the responses to the GESTURE and ASSERTED targets, as in (71) and (72). We did not include random intercepts for Participant or Item, as each participant saw only one repetition of each target (and each item effectively corresponded to a target).

(71) `glm(response~1 + Ignore + ExiProject + UniProject, family="binomial", data=tv_none_gest)`

(72) `glm(response~1 + Ignore + ExiProject + UniProject, family="binomial", data=tv_none_asrt)`

For each condition (i.e. the GESTURE and the ASSERTED conditions), we compared the models with and without each of the target readings. The comparisons revealed significant main effects of Ignore, Existentially Project, and Locally Accommodate in the GESTURE condition, but only a main effect

of Locally Accommodate in the ASSERTED condition, indicating that Ignore, Existentially Project, and Locally Accommodate were available interpretation strategies for the GESTURE sentences, and Locally Accommodate was an available strategy for the ASSERTED sentences. Table 13 displays the results of the model comparisons.

To determine if the Ignore, Existentially Project, Universally Project, and Locally Accommodate strategies were available to different degrees for the GESTURE and the ASSERTED targets, we fitted a logit model to the GESTURE and ASSERTED responses together (using contrast coding, recoding GESTURE as -.5 and ASSERTED as +.5). The model that included random intercepts for participants did not converge, so the random effects were dropped, as in (73). A comparison of the models with and without each of the interaction terms revealed significant interactions between Condition and Ignore ($\chi^2(1) = 12.6, p < .001$) and between Condition and Locally Accommodate ($\chi^2(1) = 10.1, p < .01$), but no significant interactions between Condition and Existentially Project or between Condition and Universally Project (both $p > .05$), suggesting that Ignore and Locally Accommodate, but neither Existentially Project nor Universally Project, were available to different degrees in the two conditions. Indeed, the confidence intervals of the estimated weights indicate that participants were more inclined to ignore the directional inference in the GESTURE condition, and more willing to locally accommodate the inference in the ASSERTED condition.

(73) `glm(response ~ 1 + Ignore + ExiProject + UniProject + LocalAccommodate + Condition + Ignore:Condition + ExiProject:Condition + UniProject:Condition + LocalAccommodate:Condition, family="binomial", data=tv_none)`

D.6 Experiment 1: Results for EXACTLY ONE conditions

We fitted logistic regression models to the responses to the GESTURE and ASSERTED targets, as in (74) and (75). We did not include random intercepts for Participant or Item, as each participant saw only one repetition of each target (and each item effectively corresponded to a target).

(74) `glm(response~1 + Ignore + ExiProject + UniProject + LocalAccommodate, family="binomial", data=tv_exact_gest)`

(75) `glm(response~1 + Ignore + ExiProject + UniProject, family="binomial", data=tv_exact_asrt)`

For each condition (i.e. the GESTURE and the ASSERTED conditions), we compared the models with and without each of the target readings. Model

comparisons in the GESTURE condition revealed significant main effects of Ignore and Locally Accommodate (and a marginal effect of Existentially Project), indicating that Ignore and Locally Accommodate were available interpretation strategies for the GESTURE sentences. Model comparisons in the ASSERTED condition revealed only a main effect of Locally Accommodate, indicating that the local accommodation strategy was available for the ASSERTED sentences. Table 14 displays the results of the model comparisons.

To determine if the Ignore, Existentially Project, Universally Project, and Locally Accommodate strategies were available to different degrees for the GESTURE and the ASSERTED targets, we fitted a logit model to the GESTURE and ASSERTED responses together (using contrast coding, recoding GESTURE as -.5 and ASSERTED as +.5). The model that included random intercepts for participants did not converge, so the random effects were dropped, as in (76). A comparison of the models with and without each of the interaction terms revealed a significant interaction only between Condition and Locally Accommodate ($\chi^2(1) = 16.2, p < .001$), with participants being more inclined to locally accommodate the directional inference in the ASSERTED condition.

(76) `glm(response ~ 1 + Ignore + ExiProject + UniProject + LocalAccommodate + Condition + Ignore:Condition + ExiProject:Condition + UniProject:Condition + LocalAccommodate:Condition, family="binomial", data=tv_exact)`

	Interpretation strategy	CI	Statistics
GESTURE	Ignore directional inference ✓	8 – 46%	$\chi^2(1) = 8.70$ $p < .01$
	Integrate directional inference ✓	78 – 100%	$\chi^2(1) = 132$ $p < 10^{-10}$
ASSERTED	Ignore directional inference ✓	NA	$\chi^2(1) = 5.64$ $p < .05$
	Integrate directional inference ✓	NA	$\chi^2(1) = 247$ $p < 10^{-10}$

Table 9: Results of model comparisons in the UNEMBEDDED conditions; confidence intervals are provided where available.

	Interpretation strategy	CI	Statistics
GESTURE	Ignore directional inference ✓	4 – 41%	$\chi^2(1) = 5.28$ $p < .05$
	Project directional inference ✓	0 – 100%	$\chi^2(1) = 162$ $p < 10^{-10}$
ASSERTED	Ignore directional inference ✗	NA	$\chi^2(1) = 2.80$ $p = .09$
	Project directional inference ✓	NA	$\chi^2(1) = 189$ $p < 10^{-10}$

Table 10: Results of model comparisons in the MIGHT conditions; confidence intervals are provided where available.

	Interpretation strategy	CI	Statistics
GESTURE	Ignore directional inference ✓	14 – 41%	$\chi^2(1) = 41.1$ $p < .001$
	Project directional inference ✓	4 – 25%	$\chi^2(1) = 5.41$ $p < .05$
	Locally accommodate directional inference ✓	14 – 68%	$\chi^2(1) = 26.3$ $p < .001$
ASSERTED	Ignore directional inference ✗	0 – 3%	$\chi^2(1) = .07$ $p = .79$
	Project directional inference ✓	1 – 25%	$\chi^2(1) = 4.07$ $p < .05$
	Locally accommodate directional inference ✓	68 – 100%	$\chi^2(1) = 186$ $p < 10^{-10}$

Table 11: Results of model comparisons in the NEGATION conditions; confidence intervals are provided where available.

	Interpretation strategy	CI	Statistics
GESTURE	Ignore directional inference ✓	8 – 88%	$\chi^2(1) = 30$ $p < .001$
	Existentially project directional inference ✓	2 – 6%	$\chi^2(1) = 9.13$ $p < .01$
	Universally project directional inference ✓	0 – 100%	$\chi^2(1) = 68.4$ $p < .001$
ASSERTED	Ignore directional inference ✗	0 – 8%	$\chi^2(1) = 1.07$ $p = .30$
	Existentially project directional inference ✗	1 – 61%	$\chi^2(1) = .35$ $p = .56$
	Universally project directional inference ✓	0 – 100%	$\chi^2(1) = 228$ $p < 10^{-10}$

Table 12: Results of model comparisons in the EACH conditions; confidence intervals are provided where available.

	Interpretation	CI	Statistics	
GESTURE	Ignore directional inference ✓	12 – 39%	$\chi^2(1) = 50.8$	$p < .001$
	Existentially project directional inference ✓	2 – 19%	$\chi^2(1) = 4.12$	$p < .05$
	Universally project directional inference ✗	1 – 12%	$\chi^2(1) = .12$	$p = .73$
	Locally accommodate directional inference ✓	11 – 74%	$\chi^2(1) = 28.6$	$p < .001$
ASSERTED	Ignore directional inference ✗	0 – 3%	$\chi^2(1) = .10$	$p = .76$
	Existentially project directional inference ✗	0 – 4%	$\chi^2(1) < 10^{-13}$	$p = 1$
	Universally project directional inference ✗	0 – 5%	$\chi^2(1) = .10$	$p = .76$
	Locally accommodate directional inference ✓	74 – 100%	$\chi^2(1) = 197$	$p < 10^{-10}$

Table 13: Results of model comparisons in the NONE conditions; confidence intervals are provided where available.

	Interpretation strategy	CI	Statistics	
GESTURE	Ignore directional inference ✓	13 – 54%	$\chi^2(1) = 14.9$	$p < .001$
	Existentially project directional inference ✗	5 – 89%	$\chi^2(1) = 3.25$	$p = .07$
	Universally project directional inference ✗	0 – 62%	$\chi^2(1) < 10^{-13}$	$p = 1$
	Locally accommodate directional inference ✓	46 – 87%	$\chi^2(1) = 78.4$	$p < 10^{-10}$
ASSERTED	Ignore directional inference ✗	NA	$\chi^2(1) = 0$	$p = 1$
	Existentially project directional inference ✗	NA	$\chi^2(1) = 2.26$	$p = .13$
	Universally project directional inference ✗	NA	$\chi^2(1) < 10^{-13}$	$p = 1$
	Locally accommodate directional inference ✓	NA	$\chi^2(1) = 209$	$p < 10^{-10}$

Table 14: Results of model comparisons in the EXACTLY-ONE conditions; confidence intervals are provided where available.

E Experiment 2: Pairings by environment

This appendix details the pairs of images used in the Picture Selection Task, for each environment.

E.1 Unembedded

There were two UNEMBEDDED trials: one pair of images corresponded to the TT vs. TF targets and the other corresponded to the TF vs. FF targets (see Figure 15). The predicted response patterns on the two interpretation strategies can be reconstructed from Table 4. Specifically, a participant who *ignored* the directional inference would show no preference on the TT-TF trial, but would show a preference for the TF image over the FF image, while a participant who *integrated* the directional inference would show no preference on the TF-FF trial, but would show a preference for the TT image over the TF image.

E.2 Might

There were two MIGHT trials: one pair of images corresponded to the TT vs. TF targets and the other corresponded to the TF vs. FF targets (see Figure 16). The predicted response patterns on the two interpretation strategies can be reconstructed from Table 5. Specifically, a participant who *ignored* the directional inference would show no preference on the TT-TF trial, but would show a preference for the TF image over the FF image, while a participant who *projected* the directional inference would show no preference on the TF-FF trial, but would show a preference for the TT image over the TF image.

E.3 Negation

There were two NEGATION trials: one pair of images corresponded to the TTT vs. TFT targets and the other corresponded to the FFT vs. FFF targets (see Figure 17). The predicted response patterns on the Project and Locally Accommodate readings can be reconstructed from Table 6. Specifically, a participant who *projected* the directional inference would show a preference for the TTT image over the TFT image, but would show no preference on the FFT-FFF trial, while a participant who *locally accommodated* the directional

inference would show no preference on the TTT-TFT trial, but would show a preference for the FFT image over the FFF image.

E.4 Each

There were three EACH trials: one pair of images corresponded to the TTT vs. TTF targets, one corresponded to the TTF vs. TFF targets, and the last corresponded to the TFF vs. FFF targets (see Figure 5). The predicted response patterns on the Ignore, Existentially Project, and Universally Project readings can be reconstructed from Table 1. Specifically, a participant who *ignored* the directional inference would show no preference on the TTT-TTF or TTF-TFF trials, but would show a preference for the TFF image over the FFF image; a participant who *existentially projected* the directional inference would show no preference on the TTT-TTF or TFF-FFF trials, but would show a preference for the TTF image over the TFF image; and a participant who *universally projected* the directional inference would show no preference on the TTF-TFF or TFF-FFF trials, but would show a preference for the TTT image over the TTF image.

E.5 None

There were three NONE trials: one pair of images corresponded to the TTTT vs. TTFT targets, one corresponded to the TTFT vs. TFFT targets, and one corresponded to the FFFT vs. FFFF targets (see Figure 18). The predicted response patterns on the Existentially Project, Universally Project, and Locally Accommodate readings can be reconstructed from Table 7. Specifically, a participant who *existentially projected* the directional inference would show no preference on the TTTT-TTFT or FFFT-FFFF trials, but would show a preference for the TTFT image over the TFFT image; a participant who *universally projected* the directional inference would show no preference on the TTFT-TFFT or FFFT-FFFF trials, but would show a preference for the TTTT image over the TTFT image; and a participant who *locally accommodated* the directional inference would show no preference on the TTTT-TTFT or TTFT-TFFT trials, but would show a preference for the FFFT image over the FFFF image.

E.6 Exactly one

There were three EXACTLY-ONE trials: one pair of images corresponded to the TTTT vs. TTFT targets, one corresponded to the TTFT vs. TFFT tar-

gets, and one corresponded to the FFFT vs. FFFF targets (see Figure 19). The predicted response patterns on the Existentially Project, Universally Project, and Locally Accommodate readings can be reconstructed from Table 8. Specifically, a participant who *existentially projected* the directional inference would show no preference on the TTTT-TTFT or FFFT-FFFF trials, but would show a preference for the TTFT image over the TFFF image; a participant who *universally projected* the directional inference would show no preference on the TTFT-TFFF or FFFT-FFFF trials, but would show a preference for the TTTT image over the TTFT image; and a participant who *locally accommodated* the directional inference would show no preference on the TTTT-TTFT trials, but would show a preference for the TTFT image over the TFFF image, and for the FFFT image over the FFFF image.

E.7 NO-GESTURE and NON-PATH controls

Because the control images were paired in this task, participants saw five control trials (instead of the 10 in the TVJT). One of the five trials corresponded to the NO-GESTURE controls: participants had to choose between the two images in Figure 6, which were accompanied by a description that was produced without a co-speech gesture. Since the description did not mention direction, and was therefore equally true of both images, any preference for one image over the other would indicate an inherent directionality bias.

The NON-PATH images from the TVJT were paired to yield trials where only one of the two pictures was a clear match for the speaker’s description. These trials involved the speaker uttering the direction (e.g., “The boy will go up”) accompanied by a gesture indicating the manner of movement.

F Experiment 2: Results by environment

F.1 Experiment 2: Results for UNEMBEDDED conditions

We fitted logit models to the responses in each condition, as in (77) and (78). We did not include random intercepts for Participant or Item, as each participant saw only one repetition of each target (and each item effectively corresponded to a target).

(77) `glm(response~0 + Ignore + Integrate, family="binomial", data=unem_gest)`

(78) `glm(response~0 + Ignore + Integrate, family="binomial", data=unem_asrt)`

For each condition (i.e. the GESTURE and the ASSERTED conditions), we compared the models with and without each of the target readings. The comparisons revealed main effects of both Ignore and Integrate readings, in both the GESTURE and ASSERTED conditions, indicating that Ignore and Integrate were available interpretation strategies for both versions of the sentences. Table 15 displays the results of the model comparisons.

F.2 Experiment 2: Results for MIGHT conditions

We fitted logit models to the responses in each condition, as in (79) and (80). We did not include random intercepts for Participant or Item, as each participant saw only one repetition of each target (and each item effectively corresponded to a target).

(79) `glm(response~0 + Ignore + Project, family="binomial", data=might_gest)`

(80) `glm(response~0 + Ignore + Project, family="binomial", data=might_asrt)`

For each condition (i.e. the GESTURE and the ASSERTED conditions), we compared the models with and without each of the target readings. The comparisons revealed main effects of Ignore and Integrate in both the GESTURE and ASSERTED conditions, indicating that Ignore and Integrate were available interpretation strategies for both versions of the sentences. Table 16 displays the results of the model comparisons.

F.3 Experiment 2: Results for NEGATION conditions

We fitted logit models to the responses in each condition, as in (81) and (82). We did not include random intercepts for Participant or Item, as each participant saw only one repetition of each target (and each item effectively corresponded to a target).

(81) `glm(response~0 + Ignore + Project + LocalAccommodate, family="binomial", data=neg_gest)`

(82) `glm(response~0 + Ignore + Project + LocalAccommodate, family="binomial", data=neg_asrt)`

For each condition (i.e. the GESTURE and the ASSERTED conditions), we compared the models with and without each of the target readings. The comparisons revealed a significant effect of Project but not Locally Accommodate in the GESTURE condition, and significant effects of both Project

and Locally Accommodate in the ASSERTED condition. Table 17 displays the results of the model comparisons.

F.4 Experiment 2: Results for EACH conditions

We fitted logit models to the responses in each condition, as in (83) and (84). We did not include random intercepts for Participant or Item, as each participant saw only one repetition of each target (and each item effectively corresponded to a target).

(83) `glm(response~0 + Ignore + ExiProject + UniProject, family="binomial", data=each_gest)`

(84) `glm(response~0 + Ignore + ExiProject + UniProject, family="binomial", data=each_asrt)`

For each condition (i.e. the GESTURE and the ASSERTED conditions), we compared the models with and without each of the target readings. The comparisons revealed significant main effects only of Ignore and Universally Project, in both the GESTURE and ASSERTED conditions, indicating that Ignore and Universally Project were available interpretation strategies for both versions of the sentences. Table 18 displays the results of the model comparisons.

F.5 Experiment 2: Results for NONE conditions

We fitted logit models to the responses in each condition, as in (85) and (86). We did not include random intercepts for Participant or Item, as each participant saw only one repetition of each target (and each item effectively corresponded to a target).

(85) `glmer(response~0 + Ignore + ExiProject + UniProject, family="binomial", data=none_gest)`

(86) `glmer(response~0 + Ignore + ExiProject + UniProject, family="binomial", data=none_asrt)`

For each condition (i.e. the GESTURE and the ASSERTED conditions), we compared the models with and without each of the target readings. The comparisons revealed significant main effects of Existentially Project and Universally Project for both GESTURE and ASSERTED conditions, as well as a significant effect of Locally Accommodate in the ASSERTED condition, indicating that existential and universal projection were available interpretation

strategies for the GESTURE sentences, and existential projection, universal projection, and local accommodation were available strategies for the ASSERTED sentences. Table 19 displays the results of the model comparisons.

F.6 Experiment 2: Results for EXACTLY ONE conditions

We fitted logit models to the responses in each condition, as in (87) and (88). We did not include random intercepts for Participant or Item, as each participant saw only one repetition of each target (and each item effectively corresponded to a target).

(87) `glm(response~0 + Ignore + ExiProject + UniProject + LocalAccommodate, family="binomial", data=exact_gest)`

(88) `glm(response~0 + Ignore + ExiProject + UniProject, family="binomial", data=exact_asrt)`

For each condition (i.e. the GESTURE and the ASSERTED conditions), we compared the models with and without each of the target readings. The comparisons revealed significant main effects of Existentially Project and Locally Accommodate in the GESTURE condition, and only a main effect of Locally Accommodate in the ASSERTED condition, indicating that existential projection and local accommodation were available interpretation strategies for the GESTURE sentences, and local accommodation was an available strategy for the ASSERTED sentences. Table 20 displays the results of the model comparisons.

	Interpretation strategy	CI	Statistics
GESTURE	Ignore directional inference ✓	87 – 97%	$\chi^2(1) = 86.7$ $p < 10^{-10}$
	Integrate directional inference ✓	98 – 100%	$\chi^2(1) = 72.4$ $p < 10^{-10}$
ASSERTED	Ignore directional inference ✓	53 – 72%	$\chi^2(1) = 6.38$ $p < .05$
	Integrate directional inference ✓	97 – 100%	$\chi^2(1) = 126$ $p < 10^{-10}$

Table 15: Results of model comparisons in the UNEMBEDDED conditions; confidence intervals are provided where available.

	Interpretation strategy	CI	Statistics
GESTURE	Ignore directional inference ✓	81 – 93%	$\chi^2(1) = 64.1$ $p < .001$
	Project directional inference ✓	98 – 100%	$\chi^2(1) = 92$ $p < 10^{-10}$
ASSERTED	Ignore directional inference ✓	78 – 92%	$\chi^2(1) = 56.6$ $p < .001$
	Project directional inference ✓	99 – 100%	$\chi^2(1) = 118$ $p < 10^{-10}$

Table 16: Results of model comparisons in the MIGHT conditions; confidence intervals are provided where available.

	Interpretation strategy	CI	Statistics
GESTURE	Ignore directional inference	NA	<i>Not tested</i>
	Project directional inference ✓	NA	$\chi^2(1) = 43.4 \quad p < .001$
	Locally accommodate directional inference ✗	NA	$\chi^2(1) = .82 \quad p = .37$
ASSERTED	Ignore directional inference	NA	<i>Not tested</i>
	Project directional inference ✓	NA	$\chi^2(1) = 32.4 \quad p < .001$
	Locally accommodate directional inference ✓	NA	$\chi^2(1) = 76.9 \quad p < 10^{-10}$

Table 17: Results of model comparisons in the NEGATION conditions; confidence intervals are provided where available.

	Interpretation strategy	CI	Statistics
GESTURE	Ignore directional inference ✓	89 – 98%	$\chi^2(1) = 97.6 \quad p < 10^{-10}$
	Existentially project directional inference ✗	93 – 97%	$\chi^2(1) = .01 \quad p = .92$
	Universally project directional inference ✓	99 – 100%	$\chi^2(1) = 92 \quad p < 10^{-10}$
ASSERTED	Ignore directional inference ✓	60 – 78%	$\chi^2(1) = 15.8 \quad p < .001$
	Existentially project directional inference ✗	58 – 76%	$\chi^2(1) = .25 \quad p = .62$
	Universally project directional inference ✓	0 – 100%	$\chi^2(1) = 137 \quad p < 10^{-10}$

Table 18: Results of model comparisons in the EACH conditions; confidence intervals are provided where available.

	Interpretation strategy	CI	Statistics
GESTURE	Ignore directional inference	NA	<i>Not tested</i>
	Existentially project directional inference ✓	NA	$\chi^2(1) = 5.39$ $p < .05$
	Universally project directional inference ✓	NA	$\chi^2(1) = 60.3$ $p < .001$
	Locally accommodate directional inference ✗	NA	$\chi^2(1) = 2.28$ $p = .13$
ASSERTED	Ignore directional inference	NA	<i>Not tested</i>
	Existentially project directional inference ✓	NA	$\chi^2(1) = 11.2$ $p < .001$
	Universally project directional inference ✓	NA	$\chi^2(1) = 72.4$ $p < 10^{-10}$
	Locally accommodate directional inference ✓	NA	$\chi^2(1) = 68.2$ $p < .001$

Table 19: Results of model comparisons in the NONE conditions; confidence intervals are provided where available.

	Interpretation strategy	CI	Statistics
GESTURE	Ignore directional inference	NA	<i>Not tested</i>
	Existentially project directional inference ✓	NA	$\chi^2(1) = 13.3$ $p < .001$
	Universally project directional inference ✗	NA	$\chi^2(1) = 1.22$ $p = .27$
	Locally accommodate directional inference ✓	NA	$\chi^2(1) = 97.6$ $p < 10^{-10}$
ASSERTED	Ignore directional inference	NA	<i>Not tested</i>
	Existentially project directional inference ✗	NA	$\chi^2(1) = .34$ $p = .56$
	Universally project directional inference ✗	NA	$\chi^2(1) = 1.22$ $p = .27$
	Locally accommodate directional inference ✓	NA	$\chi^2(1) = 126$ $p < 10^{-10}$

Table 20: Results of model comparisons in the EXACTLY-ONE conditions; confidence intervals are provided where available.

G Slider task

The instructions for the slider task were the same as for the TVJT and Picture Selection Task (see Appendix [A.1](#)), except for the final paragraph regarding the response options. Here, participants saw the following:

- (89) With these rules in mind, someone was given such pictures and was asked to describe them. You will see videos of her descriptions, accompanied by one picture at a time. Your task is to decide how well the picture matches the speaker's description, on a scale from "Not at all" to "Perfectly". Sometimes the answer will be clear. Other times, it will be difficult to decide. Simply answer as best as you can, by dragging the slider to fill the bar as you see fit.

The summary of the results of the slider task experiment, conducted with 54 participants (27 in each condition) are presented in Table [21](#).

<i>Environment</i>	<i>Interpretation strategies</i>									
	Ignore		LocalAccom.		Project		Existential		Universal	
	GEST	ASRT	GEST	ASRT	GEST	ASRT	GEST	ASRT	GEST	ASRT
UNEMBEDDED										
MIGHT					(cf. LocalAccom.)					
NEGATION										
EACH									(cf. LocalAccom.)	
NONE										
EXACTLY-ONE										

Tested and detected
 Tested and not detected
 Not tested

Table 21: Summary of the Slider Task results, indicating the availability of interpretation strategies in the GESTURE (n=27) and ASSERTED (n=27) conditions. In certain cases, some readings were equivalent to *local accommodation* of the inference.