

LSOP Observation Study

Little Shop

ies

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Descriptive Statistics, Comparison Variables

Demographics

Gender	Female	52.7%
Ethnicity	White/Anglo	65.2%
	Latina/o	25.3%
	Other	9.4%
Grade	3 rd – 5 th	15.8%
	6 th – 7 th	22.0%
	8 th – 9 th	41.7%

N = 372 kids

Exhibit

Human Clock	13.1%
Rain Drops	18.6%
Clippy	10.9%
Cartesian Diver	13.7%
Chaotic Currents	7.6%
Spinney Dipper	10.7%
Tornado	16.6%

N = 964 exhibit-kids
(mean = 2.6/kid)

Use Patterns

Does Student Read Sign?

Doesn't Read Sign at All	46.5%
Briefly Glances at Sign	27.5%
Completely Reads Sign	26.0%

N of exhibit-kids 961

Exhibit Used Correctly?

No	11.6%
Yes	88.4%

N of exhibit-kids = 1,024

Use Patterns, cont.

How Does Student Interact with Exhibit?

Doesn't use exhibit properly	11.6%
Moves on after figuring out exhibit	44.8%
Becomes more interested after figuring out exhibit	43.6%

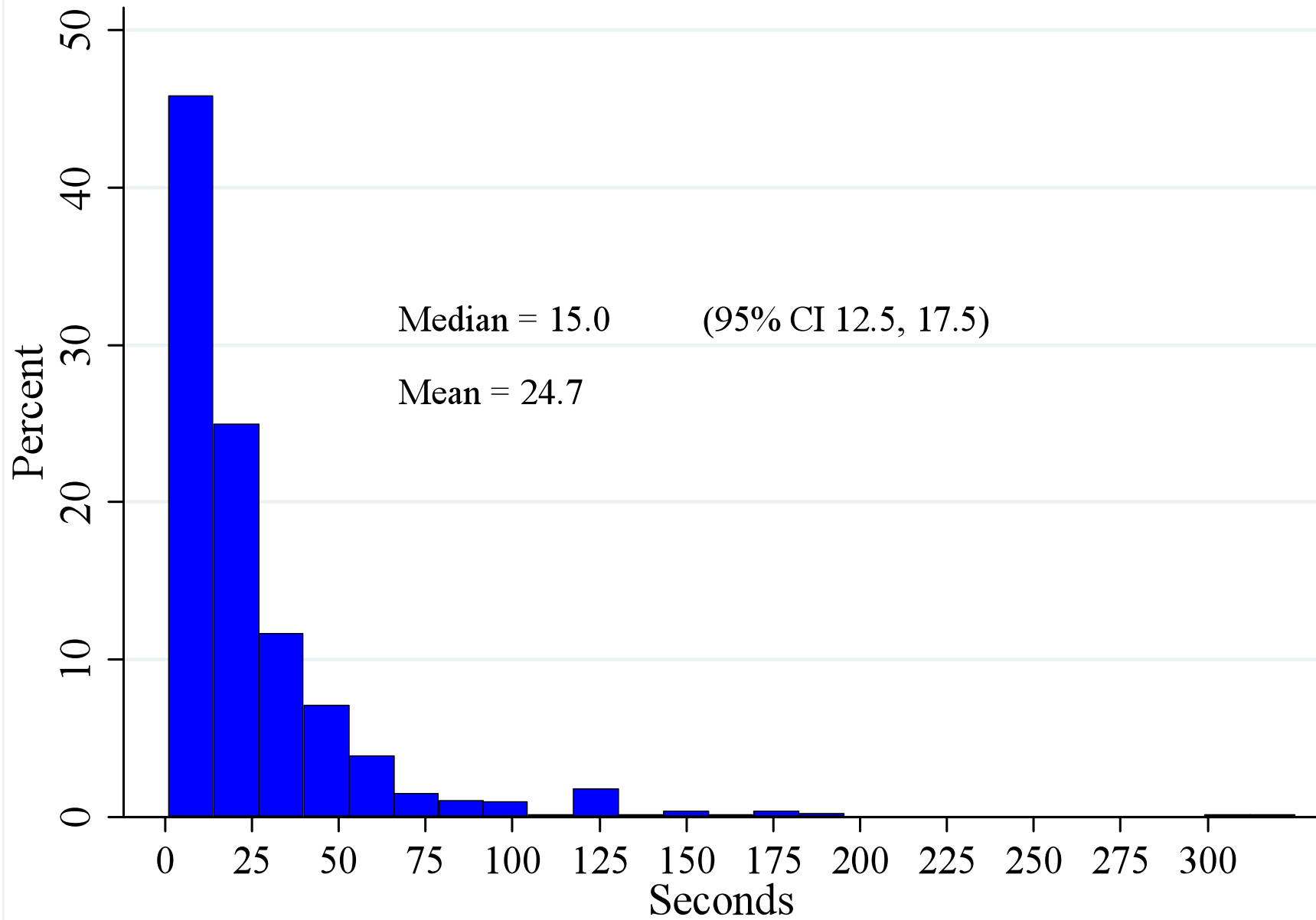
N of exhibit-kids = 964

Uses Exhibit for Inquiry vs. Physical Object?

More as physical object	0.5%
About equally	5.0%
More for inquiry	58.2%
Completely for inquiry	36.3%

N of exhibit-kids = 960

Histogram of Time Per Exhibit



Interaction with Exhibit by Gender

	Male	Female
Doesn't use exhibit properly	13.3%	12.3%
Moves on after figuring out exhibit	44.7% ↔	44.6%
Becomes more interested after figuring out exhibit	42.0% ↔	43.1%
<i>N</i> of exhibit-kids	490	536

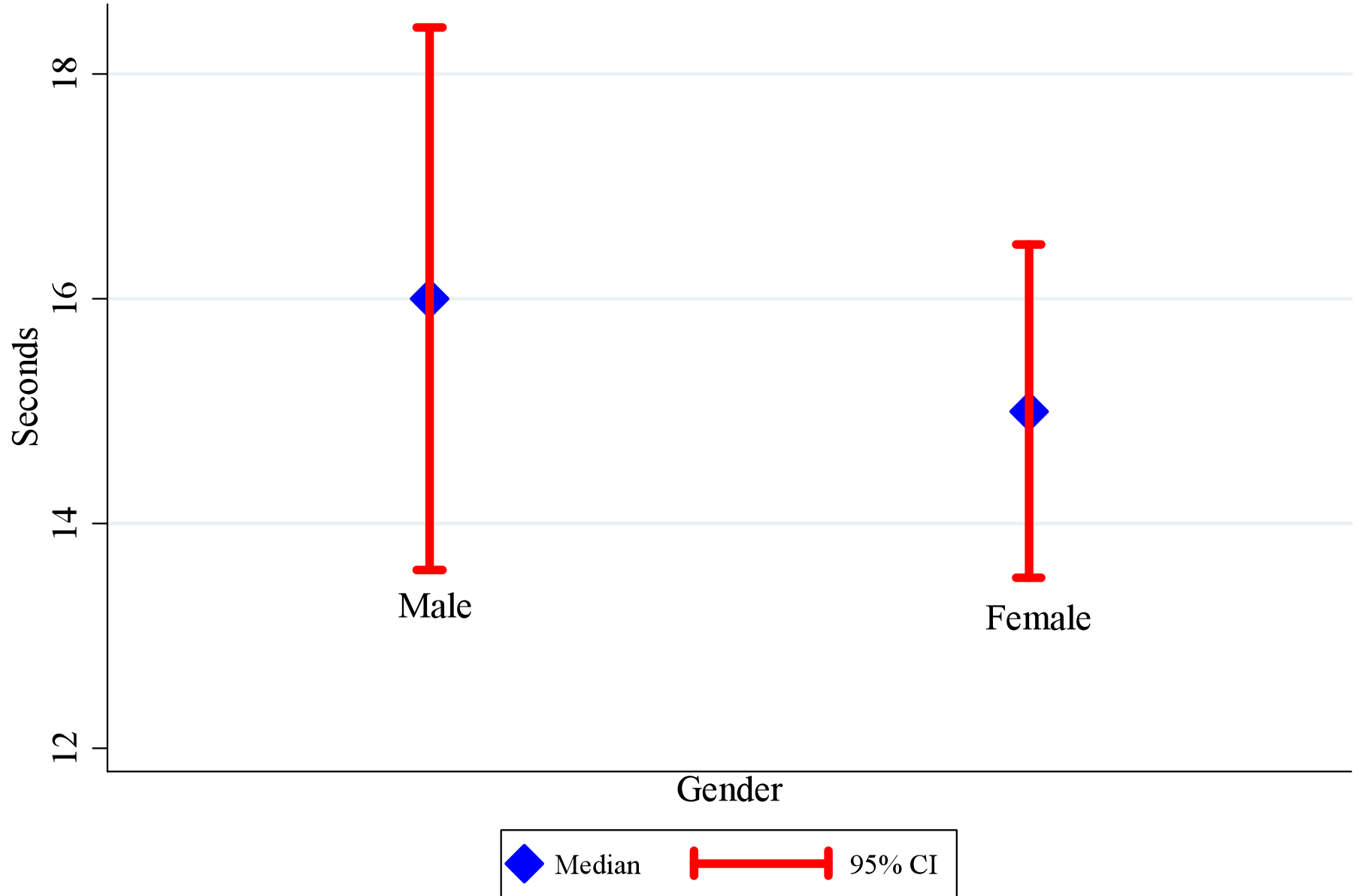
Use of Exhibit for Inquiry, by Gender

	Male	Female
About equally or less	5.7%	5.3%
More for inquiry	53.9%	↔ 62.1%
Completely for inquiry	40.4%	↔ 32.5%
<i>N</i> of exhibit-kids	453	507

Hmmm?

$CI_{\text{diff}} \cong \pm 6\%$

Median Seconds per Exhibit, by Gender



Interaction with Exhibit by Ethnicity

	White	Latina/o	Other
Doesn't use exhibit properly	10.2%	16.9%	5.7%
Moves on after figuring out exhibit	45.5%	46.8%	36.8%
Becomes more interested after figuring out	44.3%	36.4%	57.5%
<i>N</i> of exhibit-kids	637	231	87

Hmmm?

$CI_{diff} \cong \pm 5-7\%$

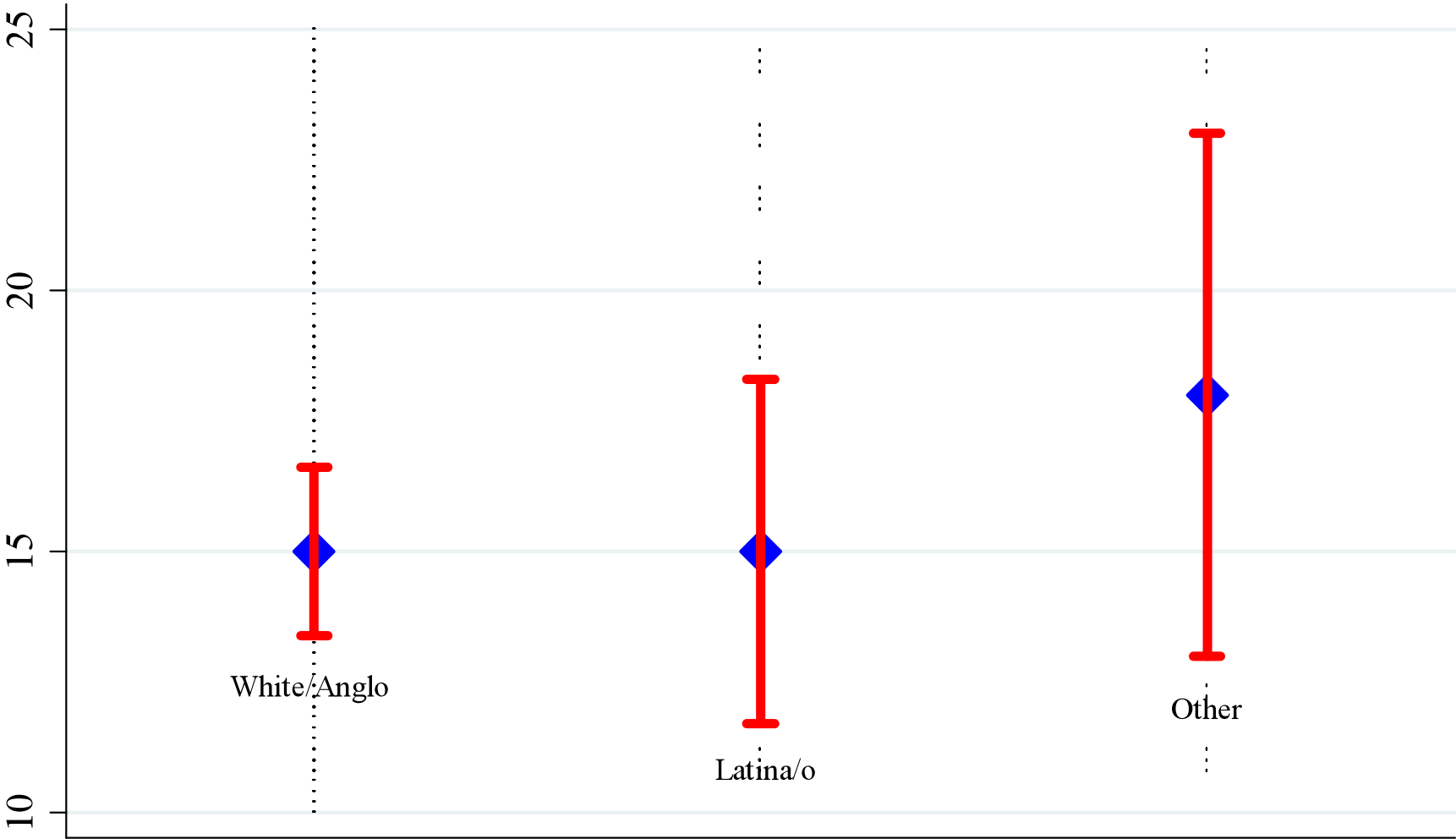
Small *N*, ignore

Use of Exhibit for Inquiry, by Ethnicity

Use Of Exhibit	White	Hispanic	Other
More as physical object	0.6%	0.0%	0.0%
About equally	6.3%	2.6%	1.1%
More for inquiry	59.6%	59.3%	46.0%
Completely for inquiry	33.5%	38.1%	52.9%
<i>N</i> of exhibit-kids	638	231	87

No difference

Median Seconds per Exhibit, by Ethnicity



◆ Median ┆──┆ 95% CI

Reads Sign by Ethnicity

	White	Hispanic	Other
Doesn't Read Sign	44.1%	58.0%	33.3%
Briefly Reads	28.6%	24.7%	26.4%
Completely Reads	27.2%	17.3%	40.2%
<i>N</i> of exhibit-kids	639	231	87

$CI_{diff} \cong \pm 6-7\%$

Interaction with Exhibit, by Grade Level

	Grade Level		
	3 rd -5 th	6 th -7 th	8-9 th
Doesn't Use Exhibit Properly	21.3%	11.8%	8.1%
Moves on after figuring out exhibit	43.1%	37.9%	49.0%
Becomes more interested after figuring out	35.6%	50.2%	42.9%
<i>N</i> of exhibit-kids	160	211	457

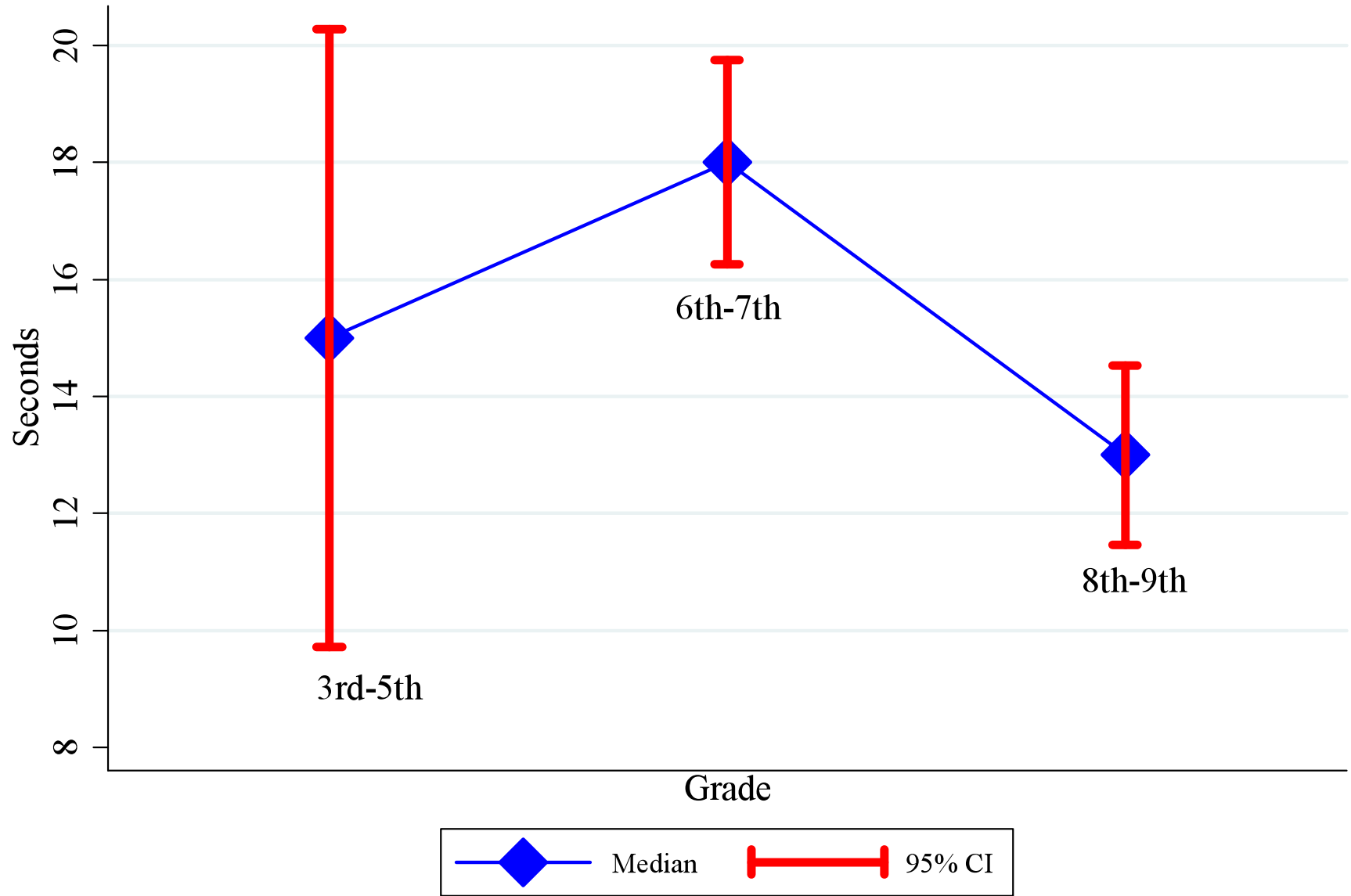
$CI_{diff} \cong \pm 11\%$

Use for Inquiry by Grade Level

	Grade Level		
	3 rd -5 th	6 th -7 th	8-9 th
More as physical object			
About equally	3.8%	3.8%	5.0%
More for inquiry	56.3%	54.3%	61.5%
Completely for inquiry	40.0%	41.9%	33.5%
<i>N</i> of exhibit-kids	160	210	457

$CI_{\text{diff}} \cong \pm 9\%$

Median Seconds Per Exhibit, by Grade



Reads Sign by Grade Level

	Grade Level		
Reads Sign	3 rd -5 th	6 th -7 th	8-9 th
Doesn't Read	65.6%	50.7%	44.4%
Briefly Reads	16.9%	23.2%	31.7%
Completely Reads	17.5%	26.1%	23.9%
<i>N</i> of exhibit-kids	160	211	457

$CI_{\text{diff}} \cong \pm 9\%$

Effects on Time Spent at An Exhibit*

	Factor Increase	95% CI
Being female (vs. male)	1.0	
3-5 th Grade (vs. 6 th -7 th)	0.58*	
8 th -9 th Grade (vs. 6 th -7 th)	0.57*	
Latina/o (vs. White Anglo)	1.0	
African-Amer. (vs. White Anglo)	0.86	

(Adjusted for “Exhibit”)

Linear mixed model , $\ln(\text{time})$, ICC = 42%

Time Spent at An Exhibit, continued.

Exhibit	Factor Increase	95% CI
Human Clock	1.3*	
Rain Drops	1.1	
Clippy	0.91	
Cartesian	0.80	
Spinney Dipper	0.88	
Tornado	2.8*	
Air Ball	1.7*	

Adjusted for demographics.

Reference exhibit is “Chaotic Currents”

Effects on “*Figures Out, Becomes More Interested*” vs. *Less*

	Factor Increase	95% CI
Being female (vs. male)	1.1	
3-5 th Grade (vs. 6 th -7 th)	0.33*	
8 th -9 th Grade (vs. 6 th -7 th)	0.60*	
Latina/o (vs. White Anglo)	1.53	
African-Amer. (vs. White Anglo)	0.69	

Adjusted for “Exhibit”

Logistic mixed model, ICC = 47%

Effects, “*Figures Out, Becomes More Interested*”, cont.

Exhibit	Factor	
	Increase	95% CI
Human Clock	1.3	
Rain Drops	1.2	
Clippy	0.77	
Cartesian	0.39*	
Spinney Dipper	1.0	
Tornado	10.*	
Air Ball	0.90	

Adjusted for demographics.

Reference exhibit is “Chaotic Currents”

Effects on “*Uses Completely for Inquiry*” vs. *Less*

	Odds Ratio	95% CI
Being female (vs. male)	0.47*	
3-5 th Grade (vs. 6 th -7 th)	0.66	
8 th -9 th Grade (vs. 6 th -7 th)	0.45	
Latina/o (vs. White Anglo)	3.7	
African-Amer. (vs. White Anglo)	1.3	0.52, 3.2

Adjusted for “Exhibit”

Logistic mixed model, ICC = 68%

Effects, “*Completely for Inquiry*”, cont.

Exhibit	Odds Ratio	95% CI
Human Clock	2.3	
Rain Drops	0.92	
Clippy	1.4	
Cartesian	1.3	
Spinney Dipper	0.64	
Tornado	5.2*	
Air Ball	0.78	

Adjusted for demographics;
Reference exhibit is “Chaotic Currents”

Summary

Gender/Ethnic differences not reliably detected

6th/7th grade best audience

Time spent per exhibit is small

Some exhibits are better than others

40-70% of differences exist within kid

The future:

Can exhibit use be altered non-invasively?

Observer effects?