

Transparent Risks: The Impact of the Specificity and Visual Encoding of Uncertainty on Decision Making

Supplemental Materials

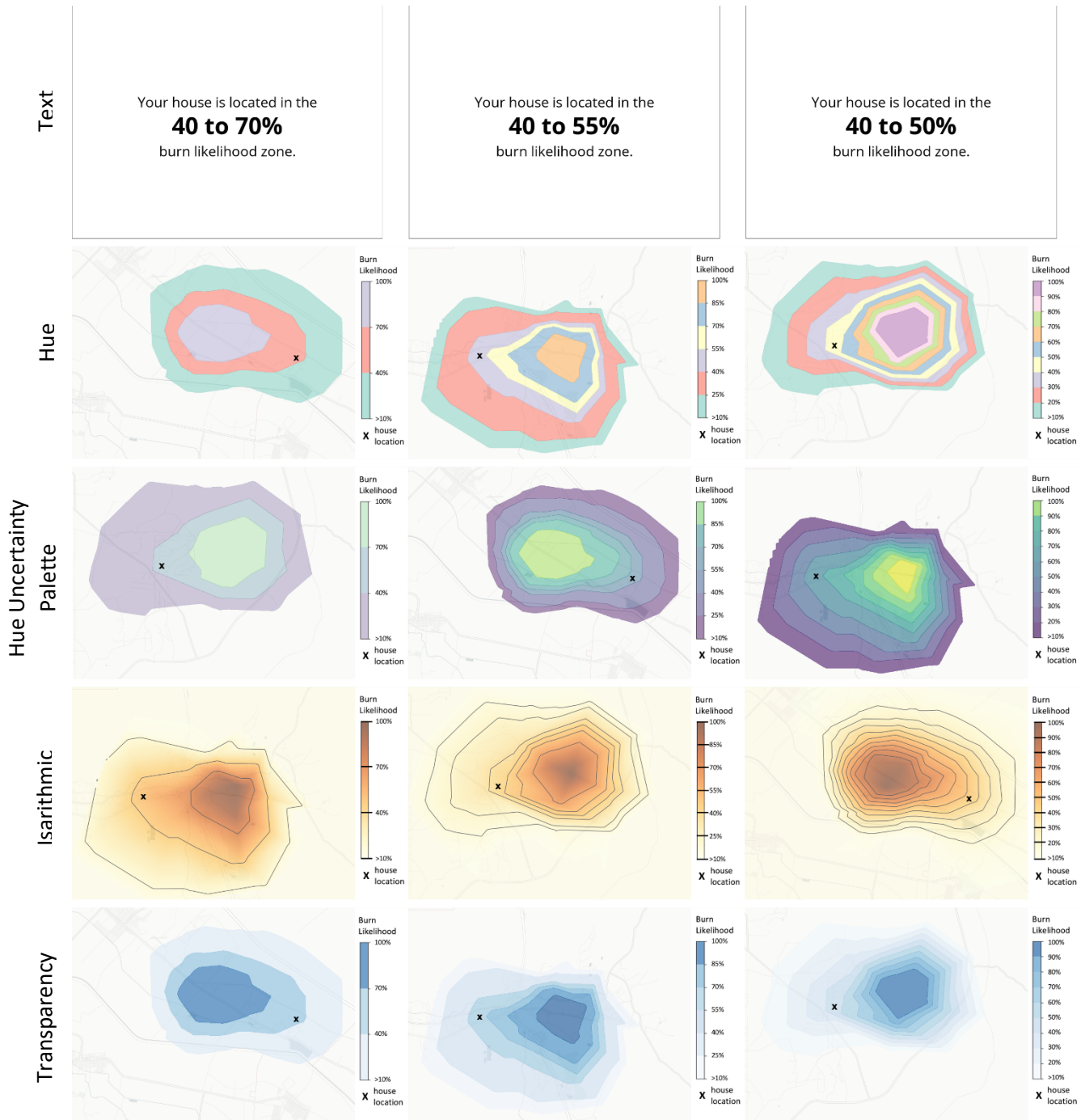
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In this document, we present additional examples of the stimuli used in our experiments, the details of the statistical tests that were summarized in the main manuscript, and additional analyses. These analyses are secondary to the key points of the manuscript, but may be of interest to readers. The stimuli used in these experiments as well as the code used to present them are available upon request to lematze@sandia.gov.

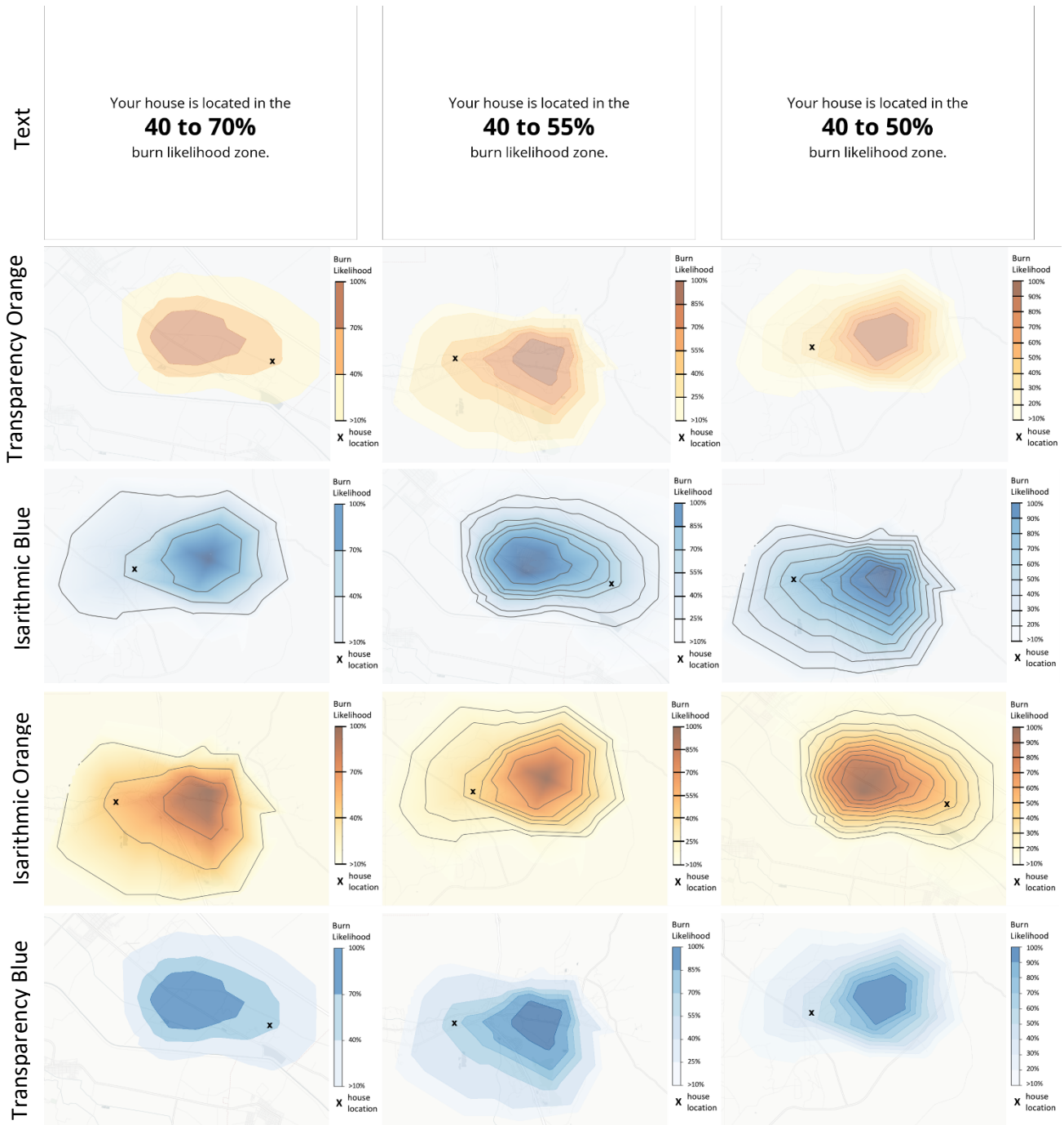
Experiment 1 Stimuli

Conditions: text, hue, value suppressing uncertainty palette, isarithmic (orange), transparency (blue)



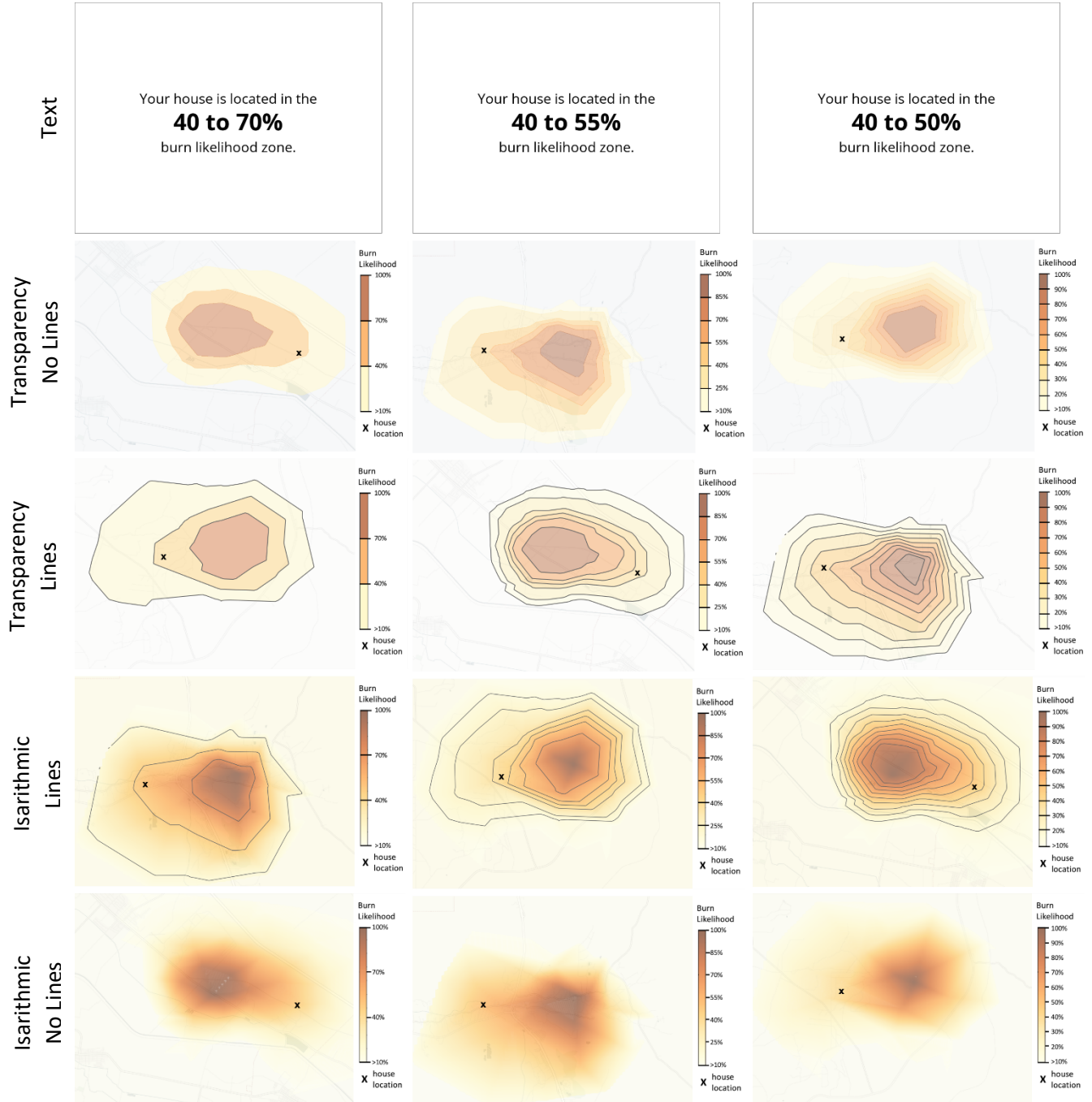
Experiment 2 Stimuli

Conditions: text, transparency (orange), isarithmic (blue), isarithmic (orange), transparency (blue)



Experiment 3 Stimuli

Conditions: text, transparency, transparency with border lines, isarithmic, isarithmic without lines (gradient)



Experiment 1 Detailed Results

Visualization versus Text Analysis

Results of 2x3 (information type x specificity) repeated measures ANOVA:

Effect	DFn	DFd	F	p	p<.05	generalized eta squared
VisOrText	1	95	56.154	3.46E-11	*	0.054
NumBands	2	190	12.963	5.28E-06	*	0.014
VisOrText:NumBands	2	190	11.008	3.00E-05	*	0.012

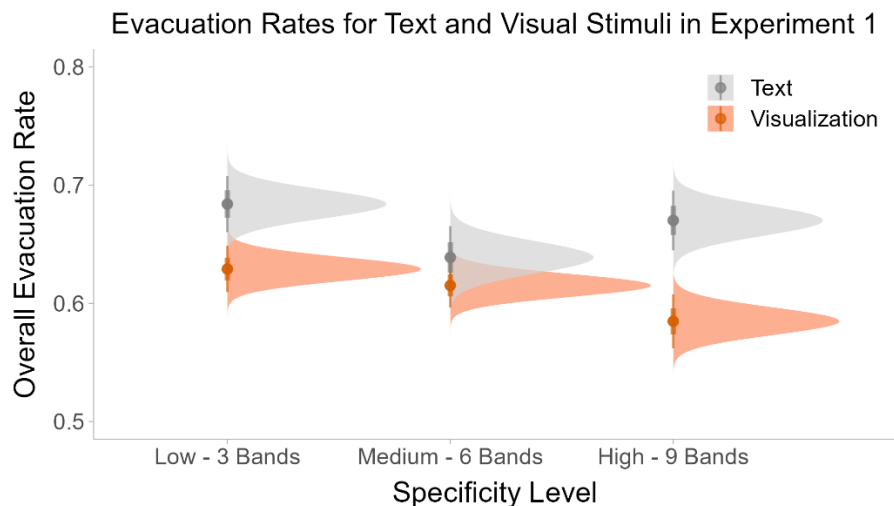
Pairwise t-tests with Bonferroni correction:

Comparing the different specificity levels:

VisOrText	.y.	group1	group2	n1	n2	p	p.signif	p.adj	p.adj.signif
Text	Evac	3	6	96	96	0.0135	*	0.0406	*
Text	Evac	3	9	96	96	0.445	ns	1	ns
Text	Evac	6	9	96	96	0.0864	ns	0.259	ns
Vis	Evac	3	6	96	96	0.346	ns	1	ns
Vis	Evac	3	9	96	96	0.00299	**	0.00898	**
Vis	Evac	6	9	96	96	0.0412	*	0.124	ns

Comparing text to visualizations within each specificity level:

NumBands	.y.	group1	group2	n1	n2	p	p.signif	p.adj	p.adj.signif
3	Evac	Text	Vis	96	96	0.000573	***	0.000573	***
6	Evac	Text	Vis	96	96	0.153	ns	0.153	ns
9	Evac	Text	Vis	96	96	1.92E-06	****	1.92E-06	****



Comparison of Visualization Conditions

Low Specificity Condition (Three Probability Bands)

Results of 5x3 (condition x risk band) repeated measures ANOVA:

Effect	DFn	DFd	F	p	p<.05	generalized eta squared
VisCond	4	380	10.714	3.08E-08	*	0.017
RiskBand	2	190	1188.369	3.89E-108	*	0.8
VisCond:RiskBand	8	760	3.724	0.000277	*	0.012

Pairwise t-tests with Bonferroni correction:

Risk Band	.y.	group1	group2	n1	n2	p	p.signif	p.adj	p.adj.signif
10-40%	Evac	Hue	Uncert Palette	96	96	0.917	ns	1	ns
10-40%	Evac	Hue	isaOrange	96	96	0.917	ns	1	ns
10-40%	Evac	Uncert Palette	isaOrange	96	96	0.836	ns	1	ns
10-40%	Evac	Hue	Text	96	96	0.468	ns	1	ns
10-40%	Evac	Uncert Palette	Text	96	96	0.407	ns	1	ns
10-40%	Evac	isaOrange	Text	96	96	0.534	ns	1	ns
10-40%	Evac	Hue	transpBlue	96	96	0.133	ns	1	ns
10-40%	Evac	Uncert Palette	transpBlue	96	96	0.162	ns	1	ns
10-40%	Evac	isaOrange	transpBlue	96	96	0.109	ns	1	ns
10-40%	Evac	Text	transpBlue	96	96	0.0262	*	0.262	ns
40-70%	Evac	Hue	Uncert Palette	96	96	0.0705	ns	0.705	ns
40-70%	Evac	Hue	isaOrange	96	96	0.481	ns	1	ns
40-70%	Evac	Uncert Palette	isaOrange	96	96	0.268	ns	1	ns
40-70%	Evac	Hue	Text	96	96	0.268	ns	1	ns
40-70%	Evac	Uncert Palette	Text	96	96	0.00365	**	0.0365	*
40-70%	Evac	isaOrange	Text	96	96	0.0705	ns	0.705	ns
40-70%	Evac	Hue	transpBlue	96	96	0.00135	**	0.0135	*
40-70%	Evac	Uncert Palette	transpBlue	96	96	0.159	ns	1	ns
40-70%	Evac	isaOrange	transpBlue	96	96	0.0121	*	0.121	ns
40-70%	Evac	Text	transpBlue	96	96	1.81E-05	****	0.000181	***
70-100%	Evac	Hue	Uncert Palette	96	96	1	ns	1	ns
70-100%	Evac	Hue	isaOrange	96	96	0.185	ns	1	ns
70-100%	Evac	Uncert Palette	isaOrange	96	96	0.185	ns	1	ns
70-100%	Evac	Hue	Text	96	96	0.0771	ns	0.771	ns
70-100%	Evac	Uncert Palette	Text	96	96	0.0771	ns	0.771	ns
70-100%	Evac	isaOrange	Text	96	96	0.658	ns	1	ns
70-100%	Evac	Hue	transpBlue	96	96	0.376	ns	1	ns
70-100%	Evac	Uncert Palette	transpBlue	96	96	0.376	ns	1	ns
70-100%	Evac	isaOrange	transpBlue	96	96	0.658	ns	1	ns
70-100%	Evac	Text	transpBlue	96	96	0.376	ns	1	ns

Medium Specificity Condition (Six Probability Bands)

Results of 5x6 (condition x risk band) repeated measures ANOVA:

Effect	DFn	DFd	F	p	p<.05	generalized eta squared
VisCond	4	380	21.276	7.55E-16	*	0.025
RiskBand	5	475	801.85	6.44E-229	*	0.717
VisCond:RiskBand	20	1900	7.197	6.58E-20	*	0.032

Pairwise t-tests with Bonferroni correction:

Risk Band	.y.	group1	group2	n1	n2	p	p.signif	p.adj	p.adj.signif
10-25%	Evac	Hue	Uncert Palette	96	96	0.12	ns	1	ns
10-25%	Evac	Hue	isaOrange	96	96	0.0458	*	0.458	ns
10-25%	Evac	Uncert Palette	isaOrange	96	96	0.657	ns	1	ns
10-25%	Evac	Hue	Text	96	96	0.0148	*	0.148	ns
10-25%	Evac	Uncert Palette	Text	96	96	0.374	ns	1	ns
10-25%	Evac	isaOrange	Text	96	96	0.657	ns	1	ns
10-25%	Evac	Hue	transpBlue	96	96	0.000176	***	0.00176	**
10-25%	Evac	Uncert Palette	transpBlue	96	96	0.0266	*	0.266	ns
10-25%	Evac	isaOrange	transpBlue	96	96	0.0758	ns	0.758	ns
10-25%	Evac	Text	transpBlue	96	96	0.183	ns	1	ns
25-40%	Evac	Hue	Uncert Palette	96	96	0.566	ns	1	ns
25-40%	Evac	Hue	isaOrange	96	96	0.848	ns	1	ns
25-40%	Evac	Uncert Palette	isaOrange	96	96	0.702	ns	1	ns
25-40%	Evac	Hue	Text	96	96	0.0132	*	0.132	ns
25-40%	Evac	Uncert Palette	Text	96	96	0.0562	ns	0.562	ns
25-40%	Evac	isaOrange	Text	96	96	0.0221	*	0.221	ns
25-40%	Evac	Hue	transpBlue	96	96	0.0358	*	0.358	ns
25-40%	Evac	Uncert Palette	transpBlue	96	96	0.00763	**	0.0763	ns
25-40%	Evac	isaOrange	transpBlue	96	96	0.0221	*	0.221	ns
25-40%	Evac	Text	transpBlue	96	96	5.60E-06	****	5.60E-05	****
40-55%	Evac	Hue	Uncert Palette	96	96	0.053	ns	0.53	ns
40-55%	Evac	Hue	isaOrange	96	96	0.162	ns	1	ns
40-55%	Evac	Uncert Palette	isaOrange	96	96	0.59	ns	1	ns
40-55%	Evac	Hue	Text	96	96	0.0676	ns	0.676	ns
40-55%	Evac	Uncert Palette	Text	96	96	0.914	ns	1	ns
40-55%	Evac	isaOrange	Text	96	96	0.667	ns	1	ns
40-55%	Evac	Hue	transpBlue	96	96	3.40E-11	****	3.40E-10	****
40-55%	Evac	Uncert Palette	transpBlue	96	96	1.69E-06	****	1.69E-05	****
40-55%	Evac	isaOrange	transpBlue	96	96	1.13E-07	****	1.13E-06	****
40-55%	Evac	Text	transpBlue	96	96	1.00E-06	****	1.00E-05	****
55-70%	Evac	Hue	Uncert Palette	96	96	0.522	ns	1	ns

55-70%	Evac	Hue	isaOrange	96	96	0.749	ns	1	ns
55-70%	Evac	Uncert Palette	isaOrange	96	96	0.337	ns	1	ns
55-70%	Evac	Hue	Text	96	96	1	ns	1	ns
55-70%	Evac	Uncert Palette	Text	96	96	0.522	ns	1	ns
55-70%	Evac	isaOrange	Text	96	96	0.749	ns	1	ns
55-70%	Evac	Hue	transpBlue	96	96	0.0254	*	0.254	ns
55-70%	Evac	Uncert Palette	transpBlue	96	96	0.00411	**	0.0411	*
55-70%	Evac	isaOrange	transpBlue	96	96	0.0552	ns	0.552	ns
55-70%	Evac	Text	transpBlue	96	96	0.0254	*	0.254	ns
70-85%	Evac	Hue	Uncert Palette	96	96	1	ns	1	ns
70-85%	Evac	Hue	isaOrange	96	96	0.734	ns	1	ns
70-85%	Evac	Uncert Palette	isaOrange	96	96	0.734	ns	1	ns
70-85%	Evac	Hue	Text	96	96	0.308	ns	1	ns
70-85%	Evac	Uncert Palette	Text	96	96	0.308	ns	1	ns
70-85%	Evac	isaOrange	Text	96	96	0.497	ns	1	ns
70-85%	Evac	Hue	transpBlue	96	96	1	ns	1	ns
70-85%	Evac	Uncert Palette	transpBlue	96	96	1	ns	1	ns
70-85%	Evac	isaOrange	transpBlue	96	96	0.734	ns	1	ns
70-85%	Evac	Text	transpBlue	96	96	0.308	ns	1	ns
85-100%	Evac	Hue	Uncert Palette	96	96	0.517	ns	1	ns
85-100%	Evac	Hue	isaOrange	96	96	0.517	ns	1	ns
85-100%	Evac	Uncert Palette	isaOrange	96	96	1	ns	1	ns
85-100%	Evac	Hue	Text	96	96	0.196	ns	1	ns
85-100%	Evac	Uncert Palette	Text	96	96	0.517	ns	1	ns
85-100%	Evac	isaOrange	Text	96	96	0.517	ns	1	ns
85-100%	Evac	Hue	transpBlue	96	96	1	ns	1	ns
85-100%	Evac	Uncert Palette	transpBlue	96	96	0.517	ns	1	ns
85-100%	Evac	isaOrange	transpBlue	96	96	0.517	ns	1	ns
85-100%	Evac	Text	transpBlue	96	96	0.196	ns	1	ns

High Specificity Condition (Nine Probability Bands)

Results of 5x9 (condition x risk band) repeated measures ANOVA:

Effect	DFn	DFd	F	p	p<.05	generalized eta squared
VisCond	4	188	14.768	1.64E-10	*	0.021
RiskBand	8	376	285.57	1.26E-154	*	0.645
VisCond:RiskBand	32	1504	2.724	8.96E-07	*	0.029

Pairwise t-tests with Bonferroni correction:

Risk Band	.y.	group1	group2	n1	n2	p	p.signif	p.adj	p.adj.signif
10-20%	Evac	Hue	Uncert Palette	96	96	0.596	ns	1	ns
10-20%	Evac	Hue	isaOrange	96	96	1	ns	1	ns
10-20%	Evac	Uncert Palette	isaOrange	96	96	0.596	ns	1	ns
10-20%	Evac	Hue	Text	96	96	0.596	ns	1	ns
10-20%	Evac	Uncert Palette	Text	96	96	1	ns	1	ns
10-20%	Evac	isaOrange	Text	96	96	0.596	ns	1	ns
10-20%	Evac	Hue	transpBlue	96	96	0.29	ns	1	ns
10-20%	Evac	Uncert Palette	transpBlue	96	96	0.596	ns	1	ns
10-20%	Evac	isaOrange	transpBlue	96	96	0.29	ns	1	ns
10-20%	Evac	Text	transpBlue	96	96	0.596	ns	1	ns
20-30%	Evac	Hue	Uncert Palette	96	72	0.0898	ns	0.898	ns
20-30%	Evac	Hue	isaOrange	96	96	0.517	ns	1	ns
20-30%	Evac	Uncert Palette	isaOrange	72	96	0.272	ns	1	ns
20-30%	Evac	Hue	Text	96	96	0.331	ns	1	ns
20-30%	Evac	Uncert Palette	Text	72	96	0.00963	**	0.0963	ns
20-30%	Evac	isaOrange	Text	96	96	0.106	ns	1	ns
20-30%	Evac	Hue	transpBlue	96	72	0.0363	*	0.363	ns
20-30%	Evac	Uncert Palette	transpBlue	72	72	0.708	ns	1	ns
20-30%	Evac	isaOrange	transpBlue	96	72	0.134	ns	1	ns
20-30%	Evac	Text	transpBlue	96	72	0.00285	**	0.0285	*
30-40%	Evac	Hue	Uncert Palette	96	96	0.59	ns	1	ns
30-40%	Evac	Hue	isaOrange	96	96	0.0123	*	0.123	ns
30-40%	Evac	Uncert Palette	isaOrange	96	96	0.0024	**	0.024	*
30-40%	Evac	Hue	Text	96	96	0.282	ns	1	ns
30-40%	Evac	Uncert Palette	Text	96	96	0.59	ns	1	ns
30-40%	Evac	isaOrange	Text	96	96	0.000364	***	0.00364	**
30-40%	Evac	Hue	transpBlue	96	96	4.30E-05	****	0.00043	***
30-40%	Evac	Uncert Palette	transpBlue	96	96	3.97E-06	****	3.97E-05	****
30-40%	Evac	isaOrange	transpBlue	96	96	0.107	ns	1	ns
30-40%	Evac	Text	transpBlue	96	96	2.87E-07	****	2.87E-06	****
40-50%	Evac	Hue	Uncert Palette	96	96	0.548	ns	1	ns
40-50%	Evac	Hue	isaOrange	96	96	0.453	ns	1	ns
40-50%	Evac	Uncert Palette	isaOrange	96	96	0.881	ns	1	ns
40-50%	Evac	Hue	Text	96	96	0.0166	*	0.166	ns
40-50%	Evac	Uncert Palette	Text	96	96	0.0028	**	0.028	*
40-50%	Evac	isaOrange	Text	96	96	0.0017	**	0.017	*
40-50%	Evac	Hue	transpBlue	96	96	3.09E-05	****	0.000309	***
40-50%	Evac	Uncert Palette	transpBlue	96	96	0.000344	***	0.00344	**
40-50%	Evac	isaOrange	transpBlue	96	96	0.000598	***	0.00598	**
40-50%	Evac	Text	transpBlue	96	96	1.03E-10	****	1.03E-09	****

50-60%	Evac	Hue	Uncert Palette	96	96	0.863	ns	1	ns
50-60%	Evac	Hue	isaOrange	96	96	0.73	ns	1	ns
50-60%	Evac	Uncert Palette	isaOrange	96	96	0.604	ns	1	ns
50-60%	Evac	Hue	Text	96	96	0.0385	*	0.385	ns
50-60%	Evac	Uncert Palette	Text	96	96	0.025	*	0.25	ns
50-60%	Evac	isaOrange	Text	96	96	0.0844	ns	0.844	ns
50-60%	Evac	Hue	transpBlue	96	96	0.00109	**	0.0109	*
50-60%	Evac	Uncert Palette	transpBlue	96	96	0.00197	**	0.0197	*
50-60%	Evac	isaOrange	transpBlue	96	96	0.000312	***	0.00312	**
50-60%	Evac	Text	transpBlue	96	96	1.30E-07	****	1.30E-06	****
60-70%	Evac	Hue	Uncert Palette	96	96	0.648	ns	1	ns
60-70%	Evac	Hue	isaOrange	96	96	0.648	ns	1	ns
60-70%	Evac	Uncert Palette	isaOrange	96	96	1	ns	1	ns
60-70%	Evac	Hue	Text	96	96	0.00642	**	0.0642	ns
60-70%	Evac	Uncert Palette	Text	96	96	0.023	*	0.23	ns
60-70%	Evac	isaOrange	Text	96	96	0.023	*	0.23	ns
60-70%	Evac	Hue	transpBlue	96	96	0.111	ns	1	ns
60-70%	Evac	Uncert Palette	transpBlue	96	96	0.0406	*	0.406	ns
60-70%	Evac	isaOrange	transpBlue	96	96	0.0406	*	0.406	ns
60-70%	Evac	Text	transpBlue	96	96	1.79E-05	****	0.000179	***
70-80%	Evac	Hue	Uncert Palette	96	96	1	ns	1	ns
70-80%	Evac	Hue	isaOrange	96	96	0.695	ns	1	ns
70-80%	Evac	Uncert Palette	isaOrange	96	96	0.695	ns	1	ns
70-80%	Evac	Hue	Text	96	96	1	ns	1	ns
70-80%	Evac	Uncert Palette	Text	96	96	1	ns	1	ns
70-80%	Evac	isaOrange	Text	96	96	0.695	ns	1	ns
70-80%	Evac	Hue	transpBlue	96	96	0.0191	*	0.191	ns
70-80%	Evac	Uncert Palette	transpBlue	96	96	0.0191	*	0.191	ns
70-80%	Evac	isaOrange	transpBlue	96	96	0.0507	ns	0.507	ns
70-80%	Evac	Text	transpBlue	96	96	0.0191	*	0.191	ns
80-90%	Evac	Hue	Uncert Palette	96	96	0.573	ns	1	ns
80-90%	Evac	Hue	isaOrange	96	96	1	ns	1	ns
80-90%	Evac	Uncert Palette	isaOrange	96	96	0.573	ns	1	ns
80-90%	Evac	Hue	Text	96	96	0.573	ns	1	ns
80-90%	Evac	Uncert Palette	Text	96	96	0.26	ns	1	ns
80-90%	Evac	isaOrange	Text	96	96	0.573	ns	1	ns
80-90%	Evac	Hue	transpBlue	96	96	0.0912	ns	0.912	ns
80-90%	Evac	Uncert Palette	transpBlue	96	96	0.26	ns	1	ns
80-90%	Evac	isaOrange	transpBlue	96	96	0.0912	ns	0.912	ns
80-90%	Evac	Text	transpBlue	96	96	0.0245	*	0.245	ns
90-100%	Evac	Hue	Uncert Palette	96	96	0.428	ns	1	ns
90-100%	Evac	Hue	isaOrange	96	96	0.114	ns	1	ns
90-100%	Evac	Uncert Palette	isaOrange	96	96	0.428	ns	1	ns

90-100%	Evac	Hue	Text	96	96	0.114	ns	1	ns
90-100%	Evac	Uncert Palette	Text	96	96	0.428	ns	1	ns
90-100%	Evac	isaOrange	Text	96	96	1	ns	1	ns
90-100%	Evac	Hue	transpBlue	96	96	0.428	ns	1	ns
90-100%	Evac	Uncert Palette	transpBlue	96	96	1	ns	1	ns
90-100%	Evac	isaOrange	transpBlue	96	96	0.428	ns	1	ns
90-100%	Evac	Text	transpBlue	96	96	0.428	ns	1	ns

Experiment 2 Detailed Results

Visualization versus Text Analysis

Results of 2x3 (information type x specificity) repeated measures ANOVA:

Effect	DFn	DFd	F	p	p<.05	generalized eta squared
VisOrText	1	71	14.459	3.00E-04	*	0.036
NumBands	2	142	6.512	0.002	*	0.012
VisOrText:NumBands	2	142	4.67	0.011	*	0.007

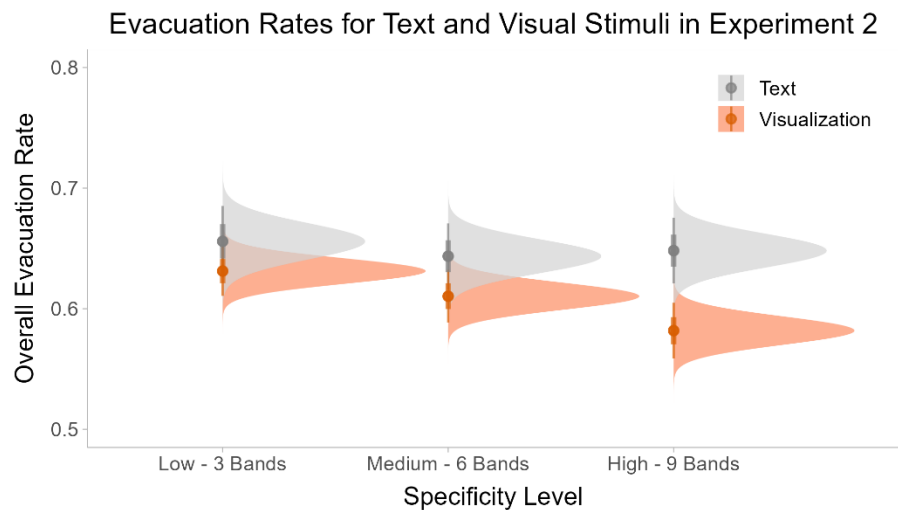
Pairwise t-tests with Bonferroni correction:

Comparing the different specificity levels:

VisOrText	.y.	group1	group2	n1	n2	p	p.signif	p.adj	p.adj.signif
Text	Evac	3	6	72	72	0.541	ns	1	ns
Text	Evac	3	9	72	72	0.702	ns	1	ns
Text	Evac	6	9	72	72	0.819	ns	1	ns
Vis	Evac	3	6	72	72	0.186	ns	0.559	ns
Vis	Evac	3	9	72	72	0.00196	**	0.00587	**
Vis	Evac	6	9	72	72	0.0718	ns	0.215	ns

Comparing text to visualizations within each specificity level:

NumBands	.y.	group1	group2	n1	n2	p	p.signif	p.adj	p.adj.signif
3	Evac	Text	Vis	72	72	0.179	ns	0.179	ns
6	Evac	Text	Vis	72	72	0.0643	ns	0.0643	ns
9	Evac	Text	Vis	72	72	0.000379	***	0.000379	***



Comparison of Visualization Conditions

Low Specificity Condition (Three Probability Bands)

Results of 5x3 (condition x risk band) repeated measures ANOVA:

Effect	DFn	DFd	F	p	p<.05	generalized eta squared
VisCond	4	284	2.491	0.043	*	0.006
RiskBand	2	142	772.5	4.87E-77	*	0.776
VisCond:RiskBand	8	568	1.216	0.287		0.006

Pairwise t-tests with Bonferroni correction:

RiskBand	.y.	group1	group2	n1	n2	p	p.signif	p.adj	p.adj.signif
10-40%	Evac	isaBlue	isaOrange	72	72	0.49	ns	1	ns
10-40%	Evac	isaBlue	Text	72	72	0.645	ns	1	ns
10-40%	Evac	isaOrange	Text	72	72	0.818	ns	1	ns
10-40%	Evac	isaBlue	transpBlue	72	72	0.931	ns	1	ns
10-40%	Evac	isaOrange	transpBlue	72	72	0.546	ns	1	ns
10-40%	Evac	Text	transpBlue	72	72	0.708	ns	1	ns
10-40%	Evac	isaBlue	transpOrange	72	72	0.584	ns	1	ns
10-40%	Evac	isaOrange	transpOrange	72	72	0.886	ns	1	ns
10-40%	Evac	Text	transpOrange	72	72	0.931	ns	1	ns
10-40%	Evac	transpBlue	transpOrange	72	72	0.645	ns	1	ns
40-70%	Evac	isaBlue	isaOrange	72	72	0.0178	*	0.178	ns
40-70%	Evac	isaBlue	Text	72	72	0.0705	ns	0.705	ns
40-70%	Evac	isaOrange	Text	72	72	0.571	ns	1	ns
40-70%	Evac	isaBlue	transpBlue	72	72	0.213	ns	1	ns
40-70%	Evac	isaOrange	transpBlue	72	72	0.258	ns	1	ns
40-70%	Evac	Text	transpBlue	72	72	0.571	ns	1	ns
40-70%	Evac	isaBlue	transpOrange	72	72	0.734	ns	1	ns
40-70%	Evac	isaOrange	transpOrange	72	72	0.042	*	0.42	ns
40-70%	Evac	Text	transpOrange	72	72	0.141	ns	1	ns
40-70%	Evac	transpBlue	transpOrange	72	72	0.365	ns	1	ns
70-100%	Evac	isaBlue	isaOrange	72	72	0.542	ns	1	ns
70-100%	Evac	isaBlue	Text	72	72	0.223	ns	1	ns
70-100%	Evac	isaOrange	Text	72	72	0.542	ns	1	ns
70-100%	Evac	isaBlue	transpBlue	72	72	0.36	ns	1	ns
70-100%	Evac	isaOrange	transpBlue	72	72	0.76	ns	1	ns
70-100%	Evac	Text	transpBlue	72	72	0.76	ns	1	ns
70-100%	Evac	isaBlue	transpOrange	72	72	0.76	ns	1	ns
70-100%	Evac	isaOrange	transpOrange	72	72	0.36	ns	1	ns
70-100%	Evac	Text	transpOrange	72	72	0.128	ns	1	ns
70-100%	Evac	transpBlue	transpOrange	72	72	0.223	ns	1	ns

Medium Specificity Condition (Six Probability Bands)

Results of 5x6 (condition x risk band) repeated measures ANOVA:

Effect	DFn	DFd	F	p	p<.05	generalized eta squared
VisCond	4	284	9.463	3.40E-07	*	0.015
RiskBand	5	355	513.358	4.83E-160	*	0.663
VisCond:RiskBand	20	1420	2.544	2.00E-04	*	0.018

Pairwise t-tests with Bonferroni correction:

RiskBand	.y.	group1	group2	n1	n2	p	p.signif	p.adj	p.adj.signif
10-25%	Evac	isaBlue	isaOrange	72	72	1	ns	1	ns
10-25%	Evac	isaBlue	Text	72	72	0.0319	*	0.319	ns
10-25%	Evac	isaOrange	Text	72	72	0.0319	*	0.319	ns
10-25%	Evac	isaBlue	transpBlue	72	72	0.37	ns	1	ns
10-25%	Evac	isaOrange	transpBlue	72	72	0.37	ns	1	ns
10-25%	Evac	Text	transpBlue	72	72	0.21	ns	1	ns
10-25%	Evac	isaBlue	transpOrange	72	72	0.72	ns	1	ns
10-25%	Evac	isaOrange	transpOrange	72	72	0.72	ns	1	ns
10-25%	Evac	Text	transpOrange	72	72	0.0735	ns	0.735	ns
10-25%	Evac	transpBlue	transpOrange	72	72	0.591	ns	1	ns
25-40%	Evac	isaBlue	isaOrange	72	72	0.405	ns	1	ns
25-40%	Evac	isaBlue	Text	72	72	0.146	ns	1	ns
25-40%	Evac	isaOrange	Text	72	72	0.532	ns	1	ns
25-40%	Evac	isaBlue	transpBlue	72	72	0.677	ns	1	ns
25-40%	Evac	isaOrange	transpBlue	72	72	0.212	ns	1	ns
25-40%	Evac	Text	transpBlue	72	72	0.0615	ns	0.615	ns
25-40%	Evac	isaBlue	transpOrange	72	72	0.212	ns	1	ns
25-40%	Evac	isaOrange	transpOrange	72	72	0.0379	*	0.379	ns
25-40%	Evac	Text	transpOrange	72	72	0.00707	**	0.0707	ns
25-40%	Evac	transpBlue	transpOrange	72	72	0.405	ns	1	ns
40-55%	Evac	isaBlue	isaOrange	72	72	0.266	ns	1	ns
40-55%	Evac	isaBlue	Text	72	72	0.108	ns	1	ns
40-55%	Evac	isaOrange	Text	72	72	0.621	ns	1	ns
40-55%	Evac	isaBlue	transpBlue	72	72	0.138	ns	1	ns
40-55%	Evac	isaOrange	transpBlue	72	72	0.00972	**	0.0972	ns
40-55%	Evac	Text	transpBlue	72	72	0.00212	**	0.0212	*
40-55%	Evac	isaBlue	transpOrange	72	72	0.0484	*	0.484	ns
40-55%	Evac	isaOrange	transpOrange	72	72	0.00212	**	0.0212	*
40-55%	Evac	Text	transpOrange	72	72	0.000377	***	0.00377	**
40-55%	Evac	transpBlue	transpOrange	72	72	0.621	ns	1	ns
55-70%	Evac	isaBlue	isaOrange	72	72	0.745	ns	1	ns
55-70%	Evac	isaBlue	Text	72	72	1	ns	1	ns

55-70%	Evac	isaOrange	Text	72	72	0.745	ns	1	ns
55-70%	Evac	isaBlue	transpBlue	72	72	0.00957	**	0.0957	ns
55-70%	Evac	isaOrange	transpBlue	72	72	0.0232	*	0.232	ns
55-70%	Evac	Text	transpBlue	72	72	0.00957	**	0.0957	ns
55-70%	Evac	isaBlue	transpOrange	72	72	0.0232	*	0.232	ns
55-70%	Evac	isaOrange	transpOrange	72	72	0.0515	ns	0.515	ns
55-70%	Evac	Text	transpOrange	72	72	0.0232	*	0.232	ns
55-70%	Evac	transpBlue	transpOrange	72	72	0.745	ns	1	ns
70-85%	Evac	isaBlue	isaOrange	72	72	0.108	ns	1	ns
70-85%	Evac	isaBlue	Text	72	72	0.228	ns	1	ns
70-85%	Evac	isaOrange	Text	72	72	0.687	ns	1	ns
70-85%	Evac	isaBlue	transpBlue	72	72	1	ns	1	ns
70-85%	Evac	isaOrange	transpBlue	72	72	0.108	ns	1	ns
70-85%	Evac	Text	transpBlue	72	72	0.228	ns	1	ns
70-85%	Evac	isaBlue	transpOrange	72	72	0.687	ns	1	ns
70-85%	Evac	isaOrange	transpOrange	72	72	0.0448	*	0.448	ns
70-85%	Evac	Text	transpOrange	72	72	0.108	ns	1	ns
70-85%	Evac	transpBlue	transpOrange	72	72	0.687	ns	1	ns
85-100%	Evac	isaBlue	isaOrange	72	72	1	ns	1	ns
85-100%	Evac	isaBlue	Text	72	72	0.479	ns	1	ns
85-100%	Evac	isaOrange	Text	72	72	0.479	ns	1	ns
85-100%	Evac	isaBlue	transpBlue	72	72	0.479	ns	1	ns
85-100%	Evac	isaOrange	transpBlue	72	72	0.479	ns	1	ns
85-100%	Evac	Text	transpBlue	72	72	0.157	ns	1	ns
85-100%	Evac	isaBlue	transpOrange	72	72	1	ns	1	ns
85-100%	Evac	isaOrange	transpOrange	72	72	1	ns	1	ns
85-100%	Evac	Text	transpOrange	72	72	0.479	ns	1	ns
85-100%	Evac	transpBlue	transpOrange	72	72	0.479	ns	1	ns

High Specificity Condition (Nine Probability Bands)

Results of 5x9 (condition x risk band) repeated measures ANOVA:

Effect	DFn	DFd	F	p	p<.05	generalized eta squared
VisCond	4	188	12.713	3.54E-09	*	0.022
RiskBand	8	376	290.36	8.64E-156	*	0.656
VisCond:RiskBand	32	1504	2.977	6.64E-08	*	0.031

Pairwise t-tests with Bonferroni correction:

Risk Band	.y.	group1	group2	n1	n2	p	p.signif	p.adj	p.adj.signif
10-20%	Evac	isaBlue	isaOrange	72	72	0.547	ns	1	ns
10-20%	Evac	isaBlue	Text	72	72	0.547	ns	1	ns
10-20%	Evac	isaOrange	Text	72	72	0.229	ns	1	ns
10-20%	Evac	isaBlue	transpBlue	72	72	0.547	ns	1	ns
10-20%	Evac	isaOrange	transpBlue	72	72	0.229	ns	1	ns
10-20%	Evac	Text	transpBlue	72	72	1	ns	1	ns
10-20%	Evac	isaBlue	transpOrange	72	72	0.229	ns	1	ns
10-20%	Evac	isaOrange	transpOrange	72	72	0.0715	ns	0.715	ns
10-20%	Evac	Text	transpOrange	72	72	0.547	ns	1	ns
10-20%	Evac	transpBlue	transpOrange	72	72	0.547	ns	1	ns
20-30%	Evac	isaBlue	isaOrange	72	72	0.462	ns	1	ns
20-30%	Evac	isaBlue	Text	72	72	0.27	ns	1	ns
20-30%	Evac	isaOrange	Text	72	72	0.713	ns	1	ns
20-30%	Evac	isaBlue	transpBlue	72	60	0.4	ns	1	ns
20-30%	Evac	isaOrange	transpBlue	72	60	0.888	ns	1	ns
20-30%	Evac	Text	transpBlue	72	60	0.833	ns	1	ns
20-30%	Evac	isaBlue	transpOrange	72	60	0.207	ns	1	ns
20-30%	Evac	isaOrange	transpOrange	72	60	0.574	ns	1	ns
20-30%	Evac	Text	transpOrange	72	60	0.833	ns	1	ns
20-30%	Evac	transpBlue	transpOrange	60	60	0.687	ns	1	ns
30-40%	Evac	isaBlue	isaOrange	72	72	1	ns	1	ns
30-40%	Evac	isaBlue	Text	72	72	0.289	ns	1	ns
30-40%	Evac	isaOrange	Text	72	72	0.289	ns	1	ns
30-40%	Evac	isaBlue	transpBlue	72	72	0.0905	ns	0.905	ns
30-40%	Evac	isaOrange	transpBlue	72	72	0.0905	ns	0.905	ns
30-40%	Evac	Text	transpBlue	72	72	0.00611	**	0.0611	ns
30-40%	Evac	isaBlue	transpOrange	72	72	0.138	ns	1	ns
30-40%	Evac	isaOrange	transpOrange	72	72	0.138	ns	1	ns
30-40%	Evac	Text	transpOrange	72	72	0.0113	*	0.113	ns
30-40%	Evac	transpBlue	transpOrange	72	72	0.832	ns	1	ns
40-50%	Evac	isaBlue	isaOrange	72	72	0.053	ns	0.53	ns
40-50%	Evac	isaBlue	Text	72	72	0.0139	*	0.139	ns
40-50%	Evac	isaOrange	Text	72	72	0.597	ns	1	ns
40-50%	Evac	isaBlue	transpBlue	72	72	0.0139	*	0.139	ns
40-50%	Evac	isaOrange	transpBlue	72	72	1.35E-05	****	0.000135	***
40-50%	Evac	Text	transpBlue	72	72	1.19E-06	****	1.19E-05	****
40-50%	Evac	isaBlue	transpOrange	72	72	0.005	**	0.05	ns
40-50%	Evac	isaOrange	transpOrange	72	72	2.74E-06	****	2.74E-05	****
40-50%	Evac	Text	transpOrange	72	72	2.08E-07	****	2.08E-06	****
40-50%	Evac	transpBlue	transpOrange	72	72	0.724	ns	1	ns

50-60%	Evac	isaBlue	isaOrange	72	72	0.426	ns	1	ns
50-60%	Evac	isaBlue	Text	72	72	0.426	ns	1	ns
50-60%	Evac	isaOrange	Text	72	72	1	ns	1	ns
50-60%	Evac	isaBlue	transpBlue	72	72	0.00561	**	0.0561	ns
50-60%	Evac	isaOrange	transpBlue	72	72	0.000387	***	0.00387	**
50-60%	Evac	Text	transpBlue	72	72	0.000387	***	0.00387	**
50-60%	Evac	isaBlue	transpOrange	72	72	0.0174	*	0.174	ns
50-60%	Evac	isaOrange	transpOrange	72	72	0.00158	**	0.0158	*
50-60%	Evac	Text	transpOrange	72	72	0.00158	**	0.0158	*
50-60%	Evac	transpBlue	transpOrange	72	72	0.691	ns	1	ns
60-70%	Evac	isaBlue	isaOrange	72	72	0.181	ns	1	ns
60-70%	Evac	isaBlue	Text	72	72	0.284	ns	1	ns
60-70%	Evac	isaOrange	Text	72	72	0.789	ns	1	ns
60-70%	Evac	isaBlue	transpBlue	72	72	0.0326	*	0.326	ns
60-70%	Evac	isaOrange	transpBlue	72	72	0.000552	***	0.00552	**
60-70%	Evac	Text	transpBlue	72	72	0.00141	**	0.0141	*
60-70%	Evac	isaBlue	transpOrange	72	72	0.0614	ns	0.614	ns
60-70%	Evac	isaOrange	transpOrange	72	72	0.00141	**	0.0141	*
60-70%	Evac	Text	transpOrange	72	72	0.0034	**	0.034	*
60-70%	Evac	transpBlue	transpOrange	72	72	0.789	ns	1	ns
70-80%	Evac	isaBlue	isaOrange	72	72	0.0149	*	0.149	ns
70-80%	Evac	isaBlue	Text	72	72	0.00457	**	0.0457	*
70-80%	Evac	isaOrange	Text	72	72	0.684	ns	1	ns
70-80%	Evac	isaBlue	transpBlue	72	72	0.415	ns	1	ns
70-80%	Evac	isaOrange	transpBlue	72	72	0.104	ns	1	ns
70-80%	Evac	Text	transpBlue	72	72	0.0423	*	0.423	ns
70-80%	Evac	isaBlue	transpOrange	72	72	0.104	ns	1	ns
70-80%	Evac	isaOrange	transpOrange	72	72	0.415	ns	1	ns
70-80%	Evac	Text	transpOrange	72	72	0.222	ns	1	ns
70-80%	Evac	transpBlue	transpOrange	72	72	0.415	ns	1	ns
80-90%	Evac	isaBlue	isaOrange	72	72	0.479	ns	1	ns
80-90%	Evac	isaBlue	Text	72	72	1	ns	1	ns
80-90%	Evac	isaOrange	Text	72	72	0.479	ns	1	ns
80-90%	Evac	isaBlue	transpBlue	72	72	1	ns	1	ns
80-90%	Evac	isaOrange	transpBlue	72	72	0.479	ns	1	ns
80-90%	Evac	Text	transpBlue	72	72	1	ns	1	ns
80-90%	Evac	isaBlue	transpOrange	72	72	0.479	ns	1	ns
80-90%	Evac	isaOrange	transpOrange	72	72	0.157	ns	1	ns
80-90%	Evac	Text	transpOrange	72	72	0.479	ns	1	ns
80-90%	Evac	transpBlue	transpOrange	72	72	0.479	ns	1	ns
90-100%	Evac	isaBlue	isaOrange	72	72	1	ns	1	ns
90-100%	Evac	isaBlue	Text	72	72	1	ns	1	ns
90-100%	Evac	isaOrange	Text	72	72	1	ns	1	ns

90-100%	Evac	isaBlue	transpBlue	72	72	0.115	ns	1	ns
90-100%	Evac	isaOrange	transpBlue	72	72	0.115	ns	1	ns
90-100%	Evac	Text	transpBlue	72	72	0.115	ns	1	ns
90-100%	Evac	isaBlue	transpOrange	72	72	1	ns	1	ns
90-100%	Evac	isaOrange	transpOrange	72	72	1	ns	1	ns
90-100%	Evac	Text	transpOrange	72	72	1	ns	1	ns
90-100%	Evac	transpBlue	transpOrange	72	72	0.115	ns	1	ns

Experiment 3 Detailed Results

Visualization versus Text Analysis

Results of 2x3 (information type x specificity) repeated measures ANOVA:

Effect	DFn	DFd	F	p	p<.05	generalized eta squared
VisOrText	1	79	44.888	2.79E-09	*	0.074
NumBands	2	158	14.04	2.44E-06	*	0.018
VisOrText:NumBands	2	158	4.424	0.014	*	0.006

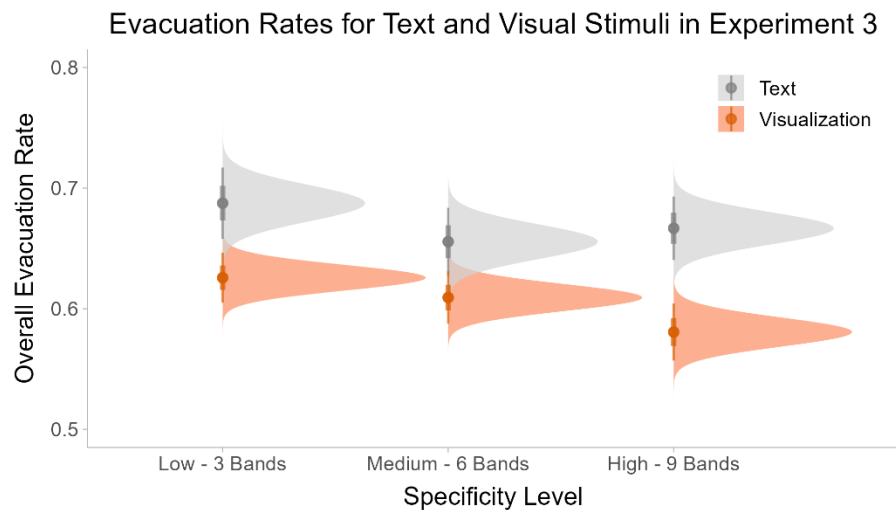
Pairwise t-tests with Bonferroni correction:

Comparing the different specificity levels:

VisOrText	.y.	group1	group2	n1	n2	p	p.signif	p.adj	p.adj.signif
Text	Evac	3	6	80	80	0.115	ns	0.345	ns
Text	Evac	3	9	80	80	0.303	ns	0.91	ns
Text	Evac	6	9	80	80	0.583	ns	1	ns
Vis	Evac	3	6	80	80	0.213	ns	0.64	ns
Vis	Evac	3	9	80	80	0.00129	**	0.00388	**
Vis	Evac	6	9	80	80	0.0457	*	0.137	ns

Comparing text to visualizations within each specificity level:

NumBands	.y.	group1	group2	n1	n2	p	p.signif	p.adj	p.adj.signif
3	Evac	Text	Vis	80	80	0.00177	**	0.00177	**
6	Evac	Text	Vis	80	80	0.0115	*	0.0115	*
9	Evac	Text	Vis	80	80	1.77E-06	****	1.77E-06	****



Comparison of Visualization Conditions

Low Specificity Condition (Six Probability Bands)

Results of 5x6 (condition x risk band) repeated measures ANOVA:

Effect	DFn	DFd	F	p	p<.05	generalized eta squared
VisCond	4	316	6.75	3.18E-05	*	0.014
RiskBand	2	158	1207.988	1.80E-96	*	0.811
VisCond:RiskBand	8	632	4.72	1.23E-05	*	0.018

Pairwise t-tests with Bonferroni correction:

Risk Band	.y.	group1	group2	n1	n2	p	p.signif	p.adj	p.adj.signif
10-40%	Evac	isaOrange	isaNoLines	80	80	0.465	ns	1	ns
10-40%	Evac	isaOrange	Text	80	80	0.0287	*	0.287	ns
10-40%	Evac	isaNoLines	Text	80	80	0.144	ns	1	ns
10-40%	Evac	isaOrange	transpOrange	80	80	0.503	ns	1	ns
10-40%	Evac	isaNoLines	transpOrange	80	80	0.161	ns	1	ns
10-40%	Evac	Text	transpOrange	80	80	0.00436	**	0.0436	*
10-40%	Evac	isaOrange	transpLines	80	80	0.446	ns	1	ns
10-40%	Evac	isaNoLines	transpLines	80	80	0.136	ns	1	ns
10-40%	Evac	Text	transpLines	80	80	0.00327	**	0.0327	*
10-40%	Evac	transpOrange	transpLines	80	80	0.927	ns	1	ns
40-70%	Evac	isaOrange	isaNoLines	80	80	0.00449	**	0.0449	*
40-70%	Evac	isaOrange	Text	80	80	0.583	ns	1	ns
40-70%	Evac	isaNoLines	Text	80	80	0.000724	***	0.00724	**
40-70%	Evac	isaOrange	transpOrange	80	80	0.188	ns	1	ns
40-70%	Evac	isaNoLines	transpOrange	80	80	0.125	ns	1	ns
40-70%	Evac	Text	transpOrange	80	80	0.0624	ns	0.624	ns
40-70%	Evac	isaOrange	transpLines	80	80	0.583	ns	1	ns
40-70%	Evac	isaNoLines	transpLines	80	80	0.0215	*	0.215	ns
40-70%	Evac	Text	transpLines	80	80	0.272	ns	1	ns
40-70%	Evac	transpOrange	transpLines	80	80	0.442	ns	1	ns
70-100%	Evac	isaOrange	isaNoLines	80	80	0.337	ns	1	ns
70-100%	Evac	isaOrange	Text	80	80	0.0553	ns	0.553	ns
70-100%	Evac	isaNoLines	Text	80	80	0.337	ns	1	ns
70-100%	Evac	isaOrange	transpOrange	80	80	0.15	ns	1	ns
70-100%	Evac	isaNoLines	transpOrange	80	80	0.631	ns	1	ns
70-100%	Evac	Text	transpOrange	80	80	0.631	ns	1	ns
70-100%	Evac	isaOrange	transpLines	80	80	0.337	ns	1	ns
70-100%	Evac	isaNoLines	transpLines	80	80	1	ns	1	ns
70-100%	Evac	Text	transpLines	80	80	0.337	ns	1	ns
70-100%	Evac	transpOrange	transpLines	80	80	0.631	ns	1	ns

Medium Specificity Condition (Six Probability Bands)

Results of 5x6 (condition x risk band) repeated measures ANOVA:

Effect	DFn	DFd	F	p	p<.05	generalized eta squared
VisCond	4	316	20.825	2.99E-15	*	0.029
RiskBand	5	395	850.35	6.79E-209	*	0.721
VisCond:RiskBand	20	1580	6.409	5.30E-17	*	0.039

Pairwise t-tests with Bonferroni correction:

Risk Band	.y.	group1	group2	n1	n2	p	p.signif	p.adj	p.adj.signif
10-25%	Evac	isaOrange	isaNoLines	80	80	0.0223	*	0.223	ns
10-25%	Evac	isaOrange	Text	80	80	0.819	ns	1	ns
10-25%	Evac	isaNoLines	Text	80	80	0.0396	*	0.396	ns
10-25%	Evac	isaOrange	transpOrange	80	80	0.819	ns	1	ns
10-25%	Evac	isaNoLines	transpOrange	80	80	0.012	*	0.12	ns
10-25%	Evac	Text	transpOrange	80	80	0.647	ns	1	ns
10-25%	Evac	isaOrange	transpLines	80	80	0.252	ns	1	ns
10-25%	Evac	isaNoLines	transpLines	80	80	0.252	ns	1	ns
10-25%	Evac	Text	transpLines	80	80	0.359	ns	1	ns
10-25%	Evac	transpOrange	transpLines	80	80	0.169	ns	1	ns
25-40%	Evac	isaOrange	isaNoLines	80	80	0.411	ns	1	ns
25-40%	Evac	isaOrange	Text	80	80	1	ns	1	ns
25-40%	Evac	isaNoLines	Text	80	80	0.411	ns	1	ns
25-40%	Evac	isaOrange	transpOrange	80	80	0.000108	***	0.00108	**
25-40%	Evac	isaNoLines	transpOrange	80	80	0.00216	**	0.0216	*
25-40%	Evac	Text	transpOrange	80	80	0.000108	***	0.00108	**
25-40%	Evac	isaOrange	transpLines	80	80	0.00216	**	0.0216	*
25-40%	Evac	isaNoLines	transpLines	80	80	0.0241	*	0.241	ns
25-40%	Evac	Text	transpLines	80	80	0.00216	**	0.0216	*
25-40%	Evac	transpOrange	transpLines	80	80	0.411	ns	1	ns
40-55%	Evac	isaOrange	isaNoLines	80	80	0.0386	*	0.386	ns
40-55%	Evac	isaOrange	Text	80	80	0.908	ns	1	ns
40-55%	Evac	isaNoLines	Text	80	80	0.0291	*	0.291	ns
40-55%	Evac	isaOrange	transpOrange	80	80	5.72E-08	****	5.72E-07	****
40-55%	Evac	isaNoLines	transpOrange	80	80	0.000602	***	0.00602	**
40-55%	Evac	Text	transpOrange	80	80	3.09E-08	****	3.09E-07	****
40-55%	Evac	isaOrange	transpLines	80	80	0.00135	**	0.0135	*
40-55%	Evac	isaNoLines	transpLines	80	80	0.25	ns	1	ns
40-55%	Evac	Text	transpLines	80	80	0.000907	***	0.00907	**
40-55%	Evac	transpOrange	transpLines	80	80	0.0216	*	0.216	ns
55-70%	Evac	isaOrange	isaNoLines	80	80	0.71	ns	1	ns

55-70%	Evac	isaOrange	Text	80	80	1	ns	1	ns
55-70%	Evac	isaNoLines	Text	80	80	0.71	ns	1	ns
55-70%	Evac	isaOrange	transpOrange	80	80	0.0638	ns	0.638	ns
55-70%	Evac	isaNoLines	transpOrange	80	80	0.138	ns	1	ns
55-70%	Evac	Text	transpOrange	80	80	0.0638	ns	0.638	ns
55-70%	Evac	isaOrange	transpLines	80	80	0.265	ns	1	ns
55-70%	Evac	isaNoLines	transpLines	80	80	0.458	ns	1	ns
55-70%	Evac	Text	transpLines	80	80	0.265	ns	1	ns
55-70%	Evac	transpOrange	transpLines	80	80	0.458	ns	1	ns
70-85%	Evac	isaOrange	isaNoLines	80	80	1	ns	1	ns
70-85%	Evac	isaOrange	Text	80	80	1	ns	1	ns
70-85%	Evac	isaNoLines	Text	80	80	1	ns	1	ns
70-85%	Evac	isaOrange	transpOrange	80	80	0.517	ns	1	ns
70-85%	Evac	isaNoLines	transpOrange	80	80	0.517	ns	1	ns
70-85%	Evac	Text	transpOrange	80	80	0.517	ns	1	ns
70-85%	Evac	isaOrange	transpLines	80	80	0.0525	ns	0.525	ns
70-85%	Evac	isaNoLines	transpLines	80	80	0.0525	ns	0.525	ns
70-85%	Evac	Text	transpLines	80	80	0.0525	ns	0.525	ns
70-85%	Evac	transpOrange	transpLines	80	80	0.196	ns	1	ns
85-100%	Evac	isaOrange	isaNoLines	80	80	1	ns	1	ns
85-100%	Evac	isaOrange	Text	80	80	1	ns	1	ns
85-100%	Evac	isaNoLines	Text	80	80	1	ns	1	ns
85-100%	Evac	isaOrange	transpOrange	80	80	0.264	ns	1	ns
85-100%	Evac	isaNoLines	transpOrange	80	80	0.264	ns	1	ns
85-100%	Evac	Text	transpOrange	80	80	0.264	ns	1	ns
85-100%	Evac	isaOrange	transpLines	80	80	0.264	ns	1	ns
85-100%	Evac	isaNoLines	transpLines	80	80	0.264	ns	1	ns
85-100%	Evac	Text	transpLines	80	80	0.264	ns	1	ns
85-100%	Evac	transpOrange	transpLines	80	80	1	ns	1	ns

High Specificity Condition (Nine Probability Bands)

Results of 5x9 (condition x risk band) repeated measures ANOVA:

Effect	DFn	DFd	F	p	p<.05	generalized eta squared
VisCond	4	188	12.713	3.54E-09	*	0.022
RiskBand	8	376	290.36	8.64E-156	*	0.656
VisCond:RiskBand	32	1504	2.977	6.64E-08	*	0.031

Pairwise t-tests with Bonferroni correction:

Risk Band	.y.	group1	group2	n1	n2	p	p.signif	p.adj	p.adj.signif
10-20%	Evac	isaOrange	isaNoLines	80	80	0.0907	ns	0.907	ns
10-20%	Evac	isaOrange	Text	80	80	0.572	ns	1	ns
10-20%	Evac	isaNoLines	Text	80	80	0.259	ns	1	ns
10-20%	Evac	isaOrange	transpOrange	80	80	0.572	ns	1	ns
10-20%	Evac	isaNoLines	transpOrange	80	80	0.0243	*	0.243	ns
10-20%	Evac	Text	transpOrange	80	80	0.259	ns	1	ns
10-20%	Evac	isaOrange	transpLines	80	80	1	ns	1	ns
10-20%	Evac	isaNoLines	transpLines	80	80	0.0907	ns	0.907	ns
10-20%	Evac	Text	transpLines	80	80	0.572	ns	1	ns
10-20%	Evac	transpOrange	transpLines	80	80	0.572	ns	1	ns
20-30%	Evac	isaOrange	isaNoLines	80	80	1	ns	1	ns
20-30%	Evac	isaOrange	Text	80	80	0.511	ns	1	ns
20-30%	Evac	isaNoLines	Text	80	80	0.511	ns	1	ns
20-30%	Evac	isaOrange	transpOrange	80	68	0.405	ns	1	ns
20-30%	Evac	isaNoLines	transpOrange	80	68	0.405	ns	1	ns
20-30%	Evac	Text	transpOrange	80	68	0.144	ns	1	ns
20-30%	Evac	isaOrange	transpLines	80	68	0.926	ns	1	ns
20-30%	Evac	isaNoLines	transpLines	80	68	0.926	ns	1	ns
20-30%	Evac	Text	transpLines	80	68	0.47	ns	1	ns
20-30%	Evac	transpOrange	transpLines	68	68	0.476	ns	1	ns
30-40%	Evac	isaOrange	isaNoLines	80	80	0.841	ns	1	ns
30-40%	Evac	isaOrange	Text	80	80	1	ns	1	ns
30-40%	Evac	isaNoLines	Text	80	80	0.841	ns	1	ns
30-40%	Evac	isaOrange	transpOrange	80	80	0.00273	**	0.0273	*
30-40%	Evac	isaNoLines	transpOrange	80	80	0.0014	**	0.014	*
30-40%	Evac	Text	transpOrange	80	80	0.00273	**	0.0273	*
30-40%	Evac	isaOrange	transpLines	80	80	0.00273	**	0.0273	*
30-40%	Evac	isaNoLines	transpLines	80	80	0.0014	**	0.014	*
30-40%	Evac	Text	transpLines	80	80	0.00273	**	0.0273	*
30-40%	Evac	transpOrange	transpLines	80	80	1	ns	1	ns
40-50%	Evac	isaOrange	isaNoLines	80	80	0.0634	ns	0.634	ns
40-50%	Evac	isaOrange	Text	80	80	0.0913	ns	0.913	ns
40-50%	Evac	isaNoLines	Text	80	80	0.000424	***	0.00424	**
40-50%	Evac	isaOrange	transpOrange	80	80	5.89E-07	****	5.89E-06	****
40-50%	Evac	isaNoLines	transpOrange	80	80	0.00141	**	0.0141	*
40-50%	Evac	Text	transpOrange	80	80	4.65E-11	****	4.65E-10	****
40-50%	Evac	isaOrange	transpLines	80	80	0.00141	**	0.0141	*
40-50%	Evac	isaNoLines	transpLines	80	80	0.176	ns	1	ns
40-50%	Evac	Text	transpLines	80	80	1.34E-06	****	1.34E-05	****
40-50%	Evac	transpOrange	transpLines	80	80	0.0634	ns	0.634	ns

50-60%	Evac	isaOrange	isaNoLines	80	80	0.167	ns	1	ns
50-60%	Evac	isaOrange	Text	80	80	0.43	ns	1	ns
50-60%	Evac	isaNoLines	Text	80	80	0.0303	*	0.303	ns
50-60%	Evac	isaOrange	transpOrange	80	80	2.93E-06	****	2.93E-05	****
50-60%	Evac	isaNoLines	transpOrange	80	80	0.000855	***	0.00855	**
50-60%	Evac	Text	transpOrange	80	80	5.70E-08	****	5.70E-07	****
50-60%	Evac	isaOrange	transpLines	80	80	0.0182	*	0.182	ns
50-60%	Evac	isaNoLines	transpLines	80	80	0.324	ns	1	ns
50-60%	Evac	Text	transpLines	80	80	0.00168	**	0.0168	*
50-60%	Evac	transpOrange	transpLines	80	80	0.0182	*	0.182	ns
60-70%	Evac	isaOrange	isaNoLines	80	80	0.145	ns	1	ns
60-70%	Evac	isaOrange	Text	80	80	0.224	ns	1	ns
60-70%	Evac	isaNoLines	Text	80	80	0.00773	**	0.0773	ns
60-70%	Evac	isaOrange	transpOrange	80	80	4.29E-05	****	0.000429	***
60-70%	Evac	isaNoLines	transpOrange	80	80	0.00773	**	0.0773	ns
60-70%	Evac	Text	transpOrange	80	80	1.46E-07	****	1.46E-06	****
60-70%	Evac	isaOrange	transpLines	80	80	0.0291	*	0.291	ns
60-70%	Evac	isaNoLines	transpLines	80	80	0.466	ns	1	ns
60-70%	Evac	Text	transpLines	80	80	0.000723	***	0.00723	**
60-70%	Evac	transpOrange	transpLines	80	80	0.0522	ns	0.522	ns
70-80%	Evac	isaOrange	isaNoLines	80	80	0.383	ns	1	ns
70-80%	Evac	isaOrange	Text	80	80	0.383	ns	1	ns
70-80%	Evac	isaNoLines	Text	80	80	1	ns	1	ns
70-80%	Evac	isaOrange	transpOrange	80	80	0.00914	**	0.0914	ns
70-80%	Evac	isaNoLines	transpOrange	80	80	0.000532	***	0.00532	**
70-80%	Evac	Text	transpOrange	80	80	0.000532	***	0.00532	**
70-80%	Evac	isaOrange	transpLines	80	80	0.383	ns	1	ns
70-80%	Evac	isaNoLines	transpLines	80	80	0.0815	ns	0.815	ns
70-80%	Evac	Text	transpLines	80	80	0.0815	ns	0.815	ns
70-80%	Evac	transpOrange	transpLines	80	80	0.0815	ns	0.815	ns
80-90%	Evac	isaOrange	isaNoLines	80	80	1	ns	1	ns
80-90%	Evac	isaOrange	Text	80	80	1	ns	1	ns
80-90%	Evac	isaNoLines	Text	80	80	1	ns	1	ns
80-90%	Evac	isaOrange	transpOrange	80	80	0.0675	ns	0.675	ns
80-90%	Evac	isaNoLines	transpOrange	80	80	0.0675	ns	0.675	ns
80-90%	Evac	Text	transpOrange	80	80	0.0675	ns	0.675	ns
80-90%	Evac	isaOrange	transpLines	80	80	0.36	ns	1	ns
80-90%	Evac	isaNoLines	transpLines	80	80	0.36	ns	1	ns
80-90%	Evac	Text	transpLines	80	80	0.36	ns	1	ns
80-90%	Evac	transpOrange	transpLines	80	80	0.36	ns	1	ns

Supplemental Analyses

Response Times

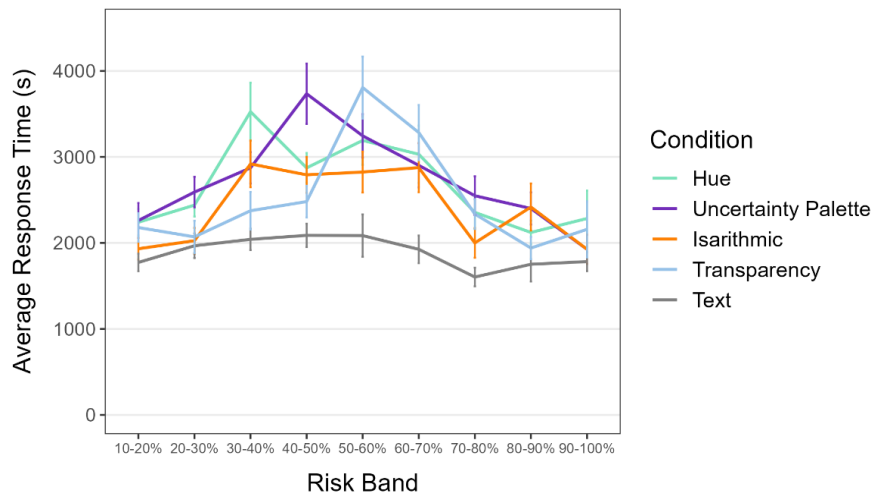
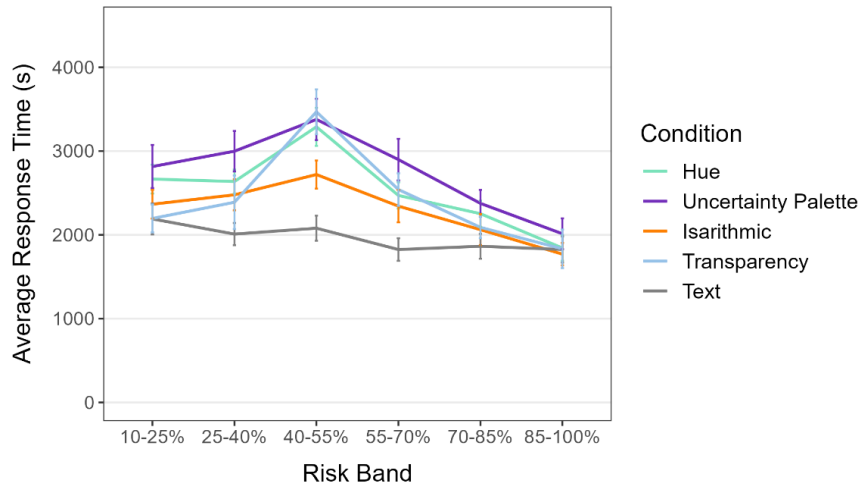
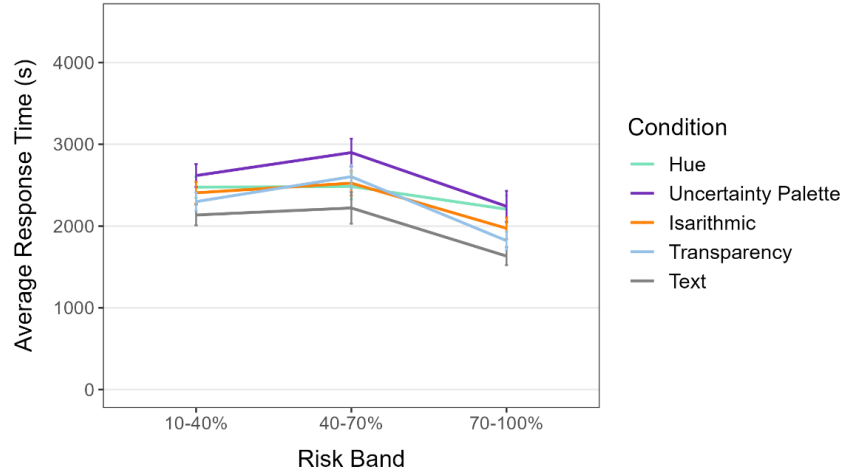
The primary focus of these experiments was the participants' patterns of decision making. However, their response times (RTs) were also collected for each trial. Prior to analyzing the RTs, we removed any trials that had a response time of less than 500 milliseconds (ms) or greater than 30 seconds. Since the data collection took place online and the trials did not have a time limit, there were some trials with extremely long RTs, indicating that the participant paused to do something else before returning to the experiment. The 30 second cutoff was intended to remove those trials from the analysis. At the other end of the spectrum, the 500 ms cutoff was intended to remove trials where participants clicked a response button without fully considering the information on the screen. The table below shows how many trials were excluded under each criterion, as well as how many remained in the response time analysis for each experiment.

Experiment	Trials Excluded for RTs < 500 ms	Trials Excluded for RTs > 30 s	Trials Remaining in the RT Analysis
1	6	52	12,902
2	14	40	9,666
3	3	17	10,780

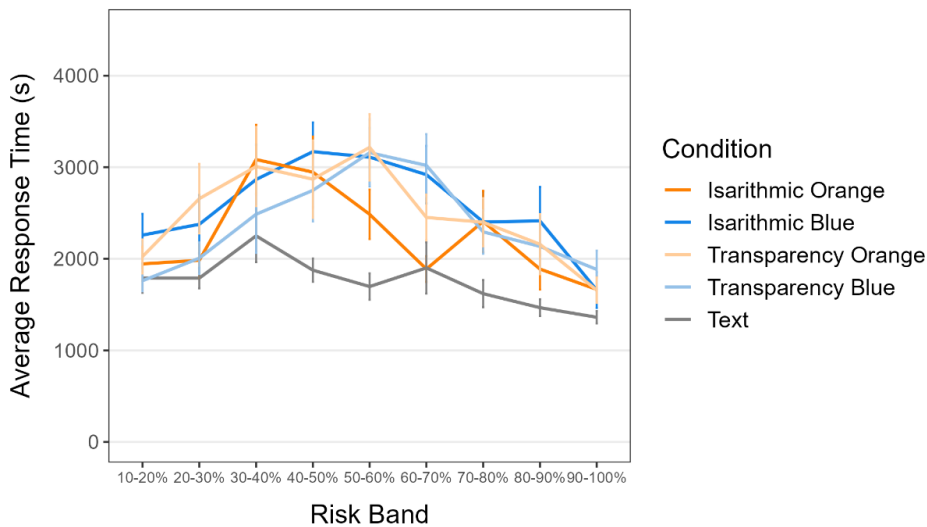
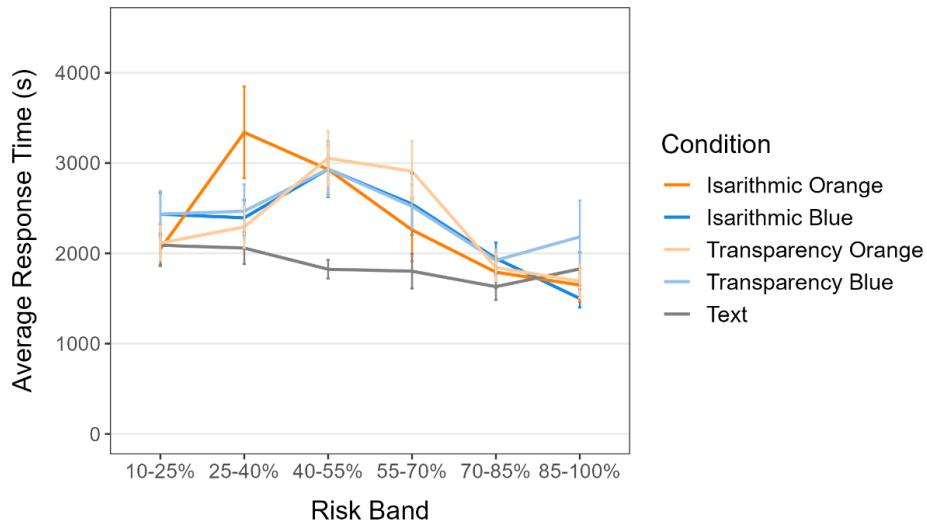
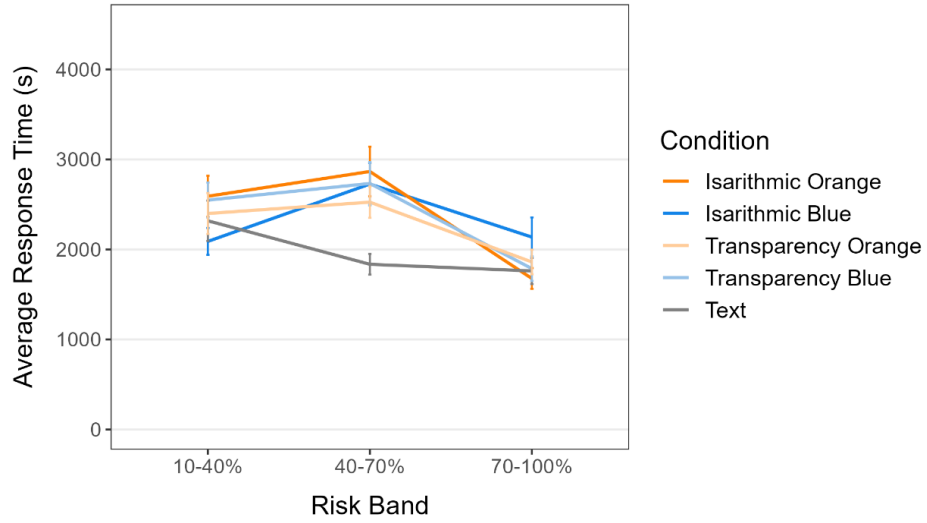
The participants' average RTs are shown in the plots below. Note that the average RTs were generally longer for the intermediate risk bands. In the highest and lowest risk bands, the correct decision was clear. In the intermediate bands, the participants spent more time considering their decisions. The text conditions typically had the fastest RTs, with slower RTs for the visualizations. This is consistent with the pattern of decision making we observed where the participants appeared to base their decisions on the highest number in the text stimuli while using the relative location of the house within the risk band to make more nuanced decisions about the visualizations.

Interestingly, in the high-specificity conditions, the visualization types differed in terms of which risk band produced the highest average RTs. For example, in Experiment 1, the participants' longest RTs for the hue and isarithmic conditions were in the 30-40% risk band, their longest RTs for the hue uncertainty palette condition were in the 40-50% risk band, and their longest RTs for the transparency condition were in the 50-60% risk band. Across all three experiments, the participants' longest RTs for the transparency conditions typically corresponded to higher risk levels than for the other visualization conditions. This pattern supports the idea that the participants perceived the risk to be lower in the transparency conditions. For the other conditions, they spent more time considering their decisions at lower risk levels, whereas for the transparency condition they made a quicker decision and were more likely to decide to stay in the house. It was only when the risk levels got higher for the transparency maps that the participants spent more time debating whether to stay or evacuate.

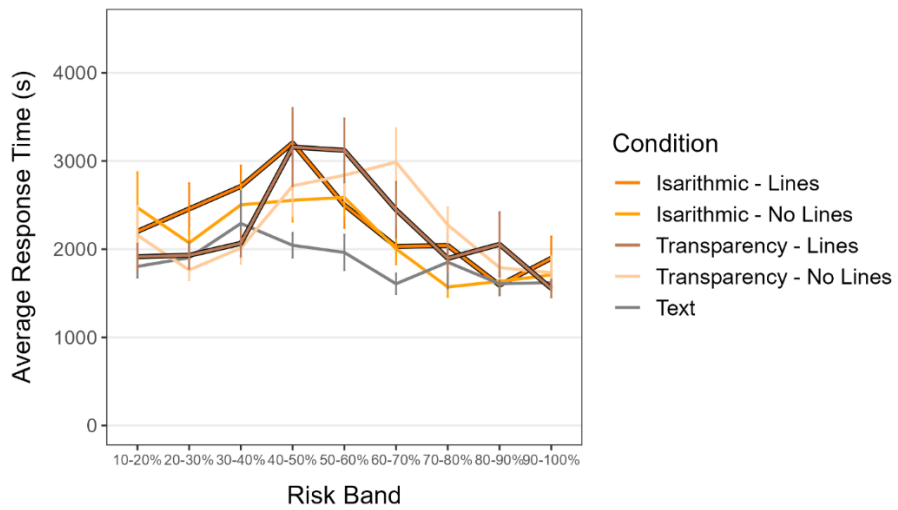
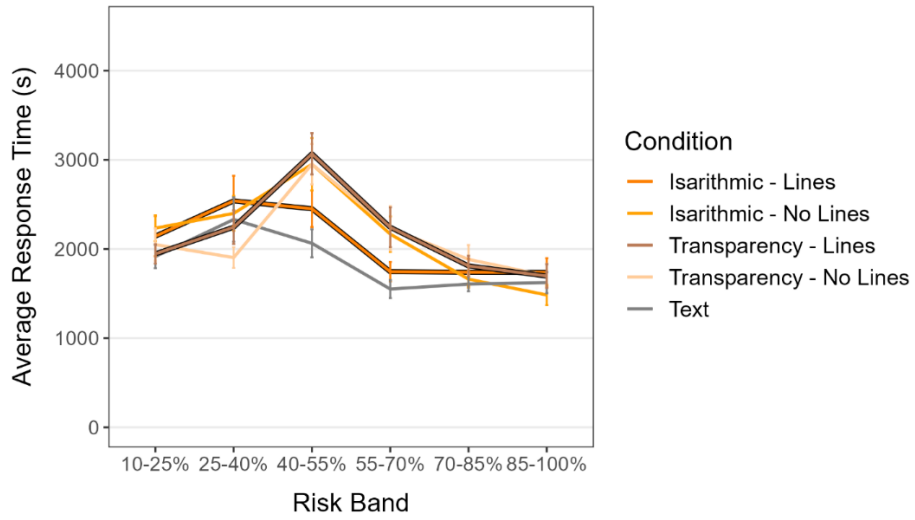
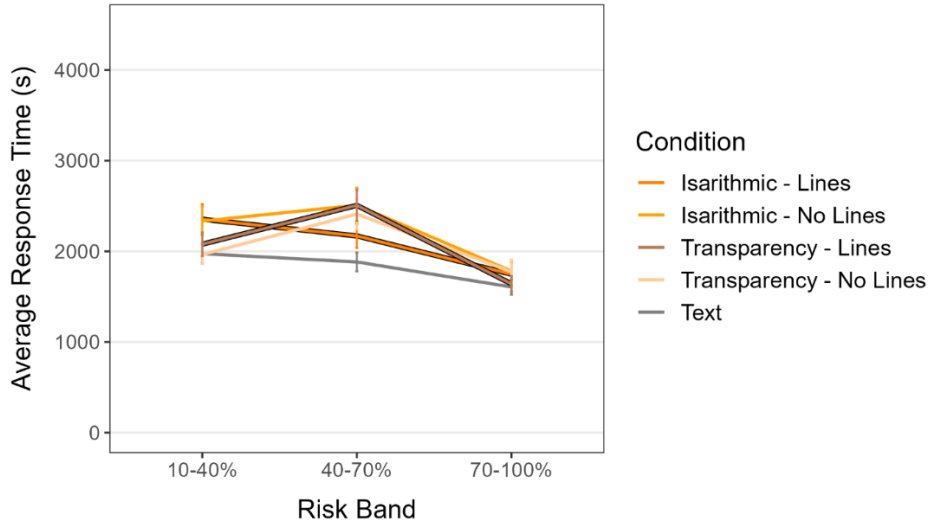
Experiment 1 RT Results



Experiment 2 RT Results



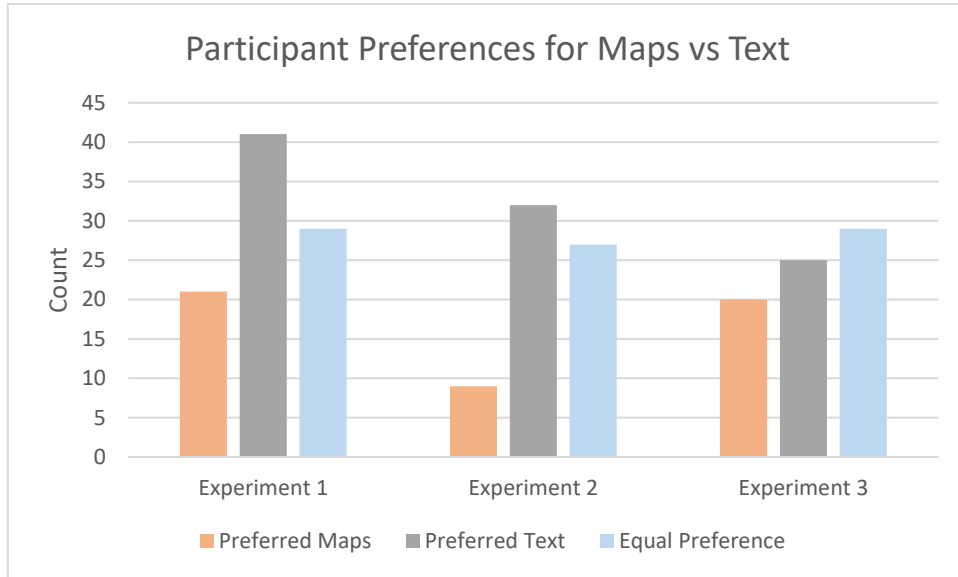
Experiment 3 RT Results



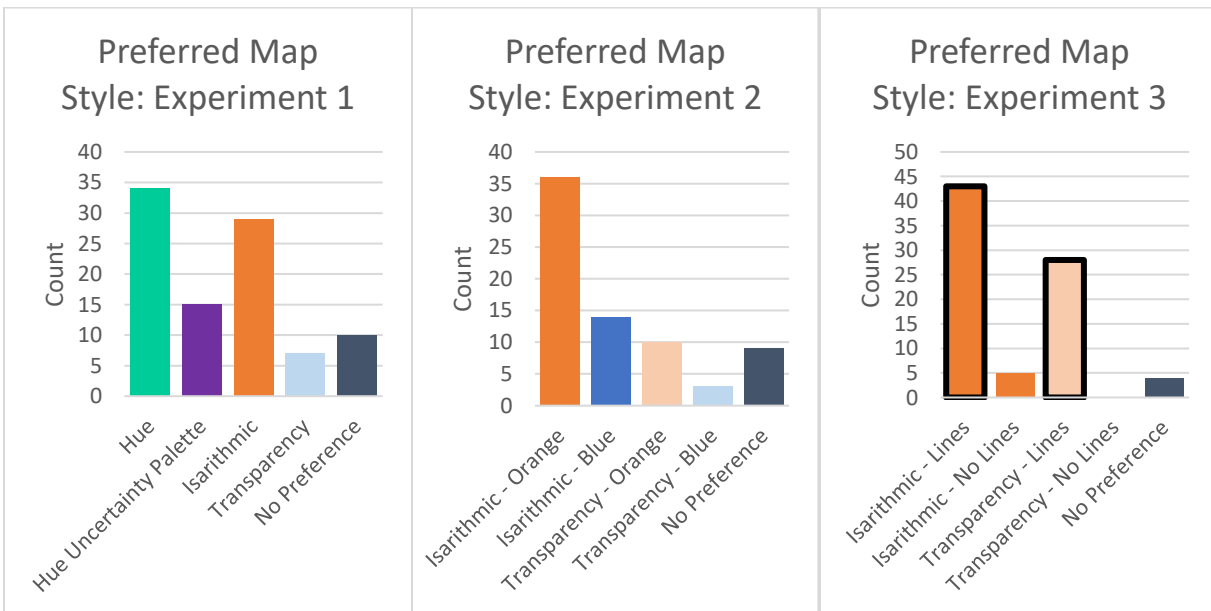
The complete statistical analyses of the RT data are available upon request to the authors.

Participant Preferences

At the end of each experiment, the participants were asked whether they preferred the visualizations or the text and which style of visualization they preferred. The first of the figures below shows the participants' preferences for visualizations or text in all three experiments. The participants generally preferred the text or reported that they liked both equally.

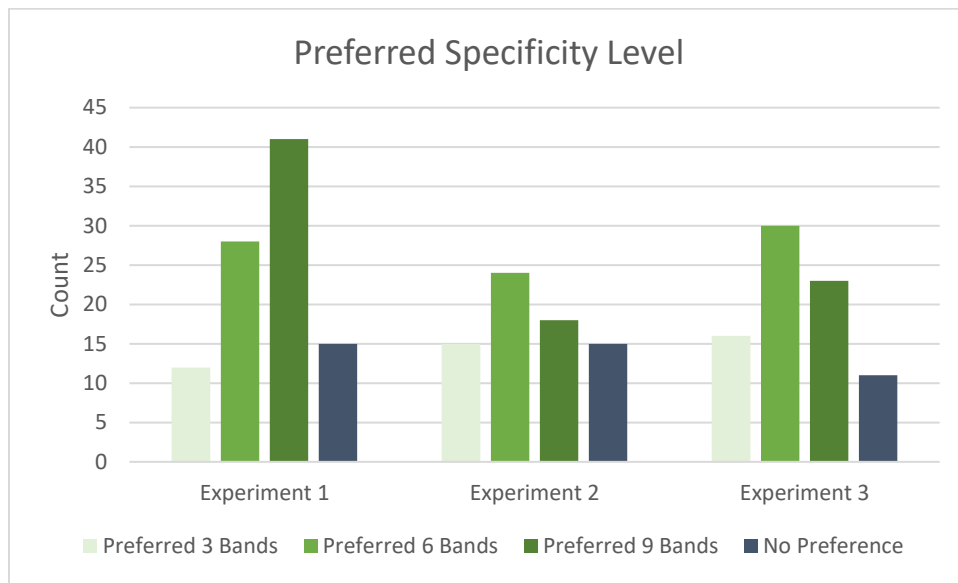


We also asking which style of map they preferred. Their responses are shown in the figure below.

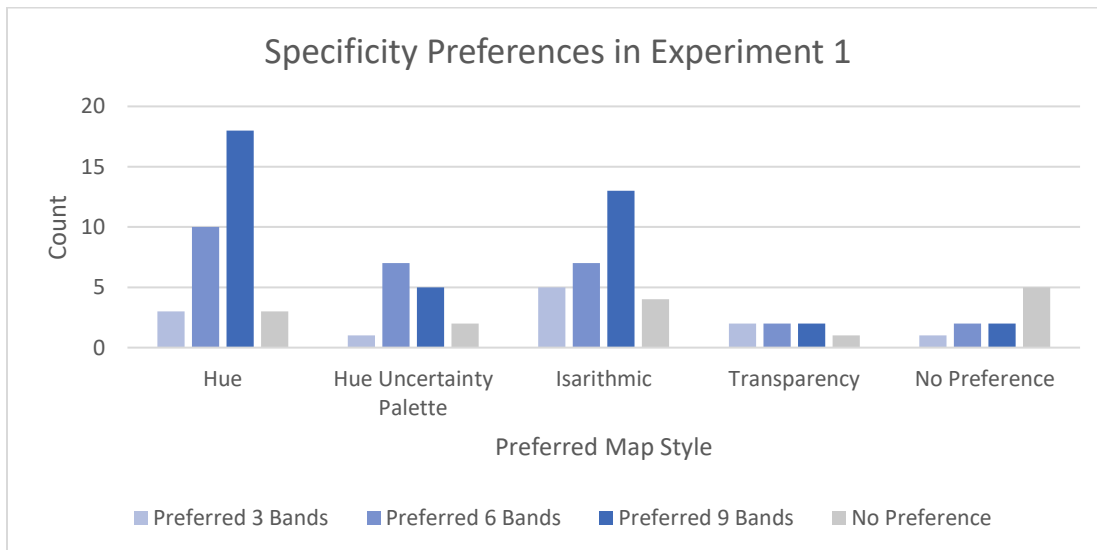


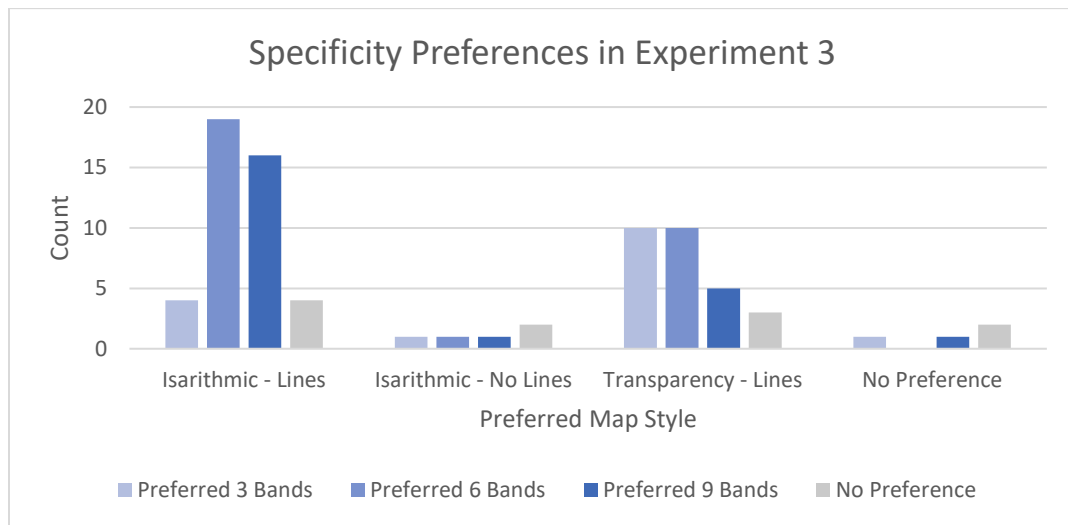
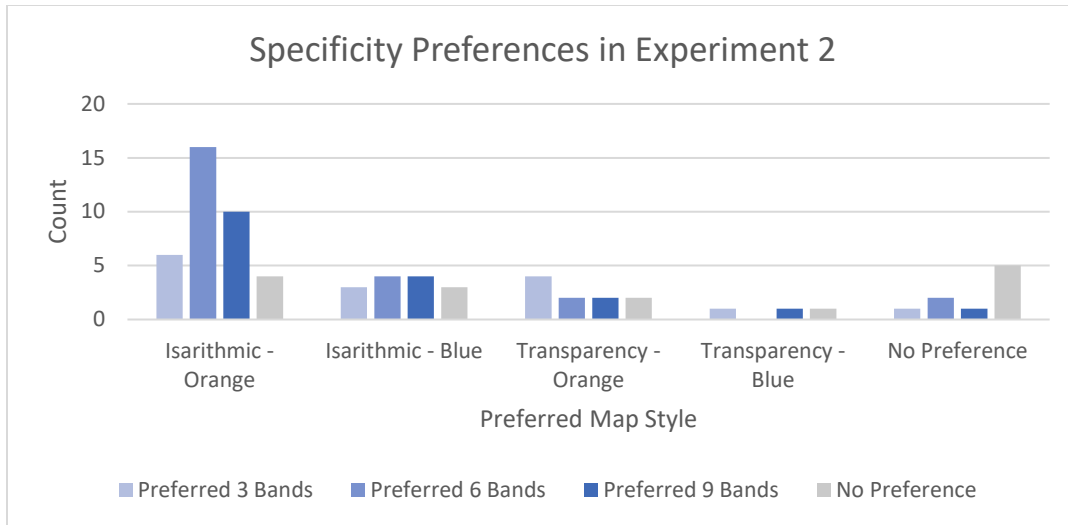
In Experiment 1, the participants strongly preferred the hue and isarithmic maps over the others. Very few people liked the transparency maps. In Experiment 2, the participants overwhelmingly preferred the orange isarithmic maps. Interestingly, the blue isarithmic maps were much less popular, even though the participants' performance was very similar for the two types of isarithmic maps. They also preferred the orange transparency maps to the blue transparency maps. This suggests that the semantic match between the risk map hue and the hazard was meaningful to the participants. Finally, in Experiment 3, the participants strongly preferred the maps with boundary lines to those that did not have boundary lines. Not one of the 80 participants said that they preferred the transparency maps without boundary lines. The isarithmic maps were still preferred over the transparency maps with boundary lines.

The participants were also asked whether they preferred the maps with three, six, or nine probability bands. The counts for all three experiments are shown below:



We broke this down to find out whether there were any relationships between the participants' preferred map type and their preferred number of bands. The results are shown in the plots below.





It is notable that in Experiment 1, the participants tended to prefer the high-specificity maps. In Experiments 2 and 3, where the isarithmic maps were the most popular, more participants reported that they preferred the medium-specificity maps.

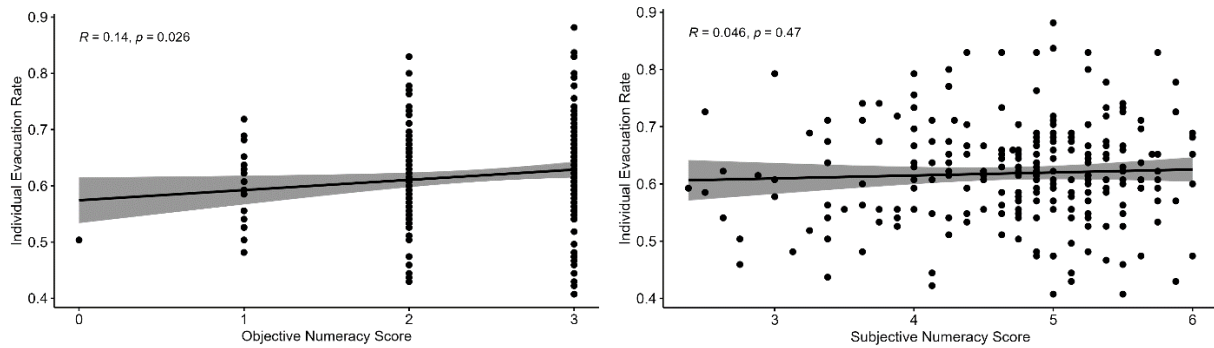
Finally, the survey at the end of the experiment asked the participants if they had ever evacuated from their home due to a natural disaster in real life. Out of the 248 participants in the three experiments, only 12 had real-life experience with evacuation. We had planned to test whether participants with real-life experience would make different patterns of decisions than other participants, but this sample size was too small to support that type of analysis.

Individual Differences Measures

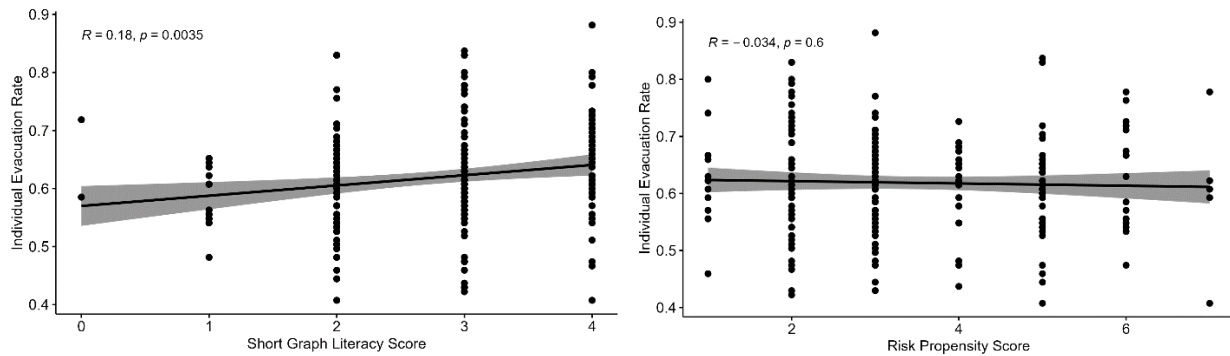
As discussed in the paper, all of the participants completed a pre-test that consisted of several individual differences measures. These included the Subjective Numeracy Scale (Fagerlin et al., 2007), the Objective Numeracy Scale (Schwartz, 1997), the Short Graph Literacy Scale (Okan et al., 2019) and the Dohmen measure of risk-taking propensity (Dohmen et al., 2011; Szrek et al., 2012). We collected these

measures because we hypothesized that the participants' evacuation rates might be modulated by their abilities in these areas and their general level of risk tolerance.

We assessed the correlations between the participants' scores on each of these measures and the proportion of trials for which each participant chose to evacuate. The plots below show the results of this analysis. We found a small but significant correlation between the Objective Numeracy Scores and each participant's overall evacuation rate ($R = 0.14$, $p < 0.03$), but there was not a significant correlation for the Subjective Numeracy Scores ($R = 0.046$, $p = 0.47$). The participants with higher Objective Numeracy scores were slightly more likely to evacuate than those with lower scores.



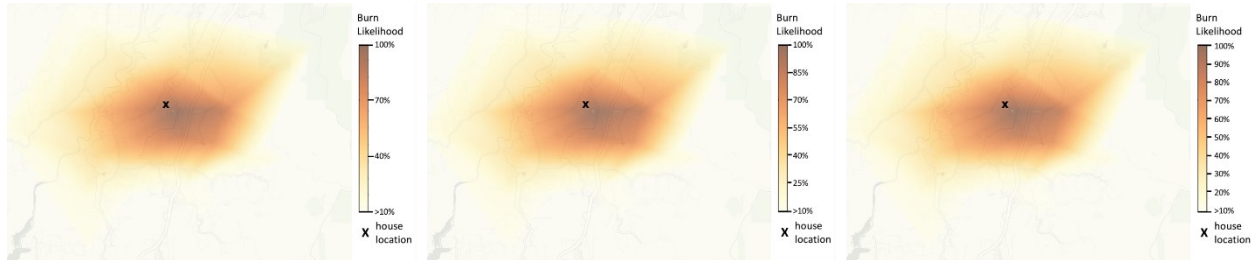
There was also a small but significant correlation between the participants' Short Graph Literacy Scores and their evacuation rates ($R = 0.18$, $p < 0.01$). Once again, the participants with higher scores (and therefore better graph literacy) were slightly more likely to evacuate. There was not a significant correlation between the participants' self-reported risk tolerance and their evacuation rates ($R = -0.03$, $p = 0.60$).



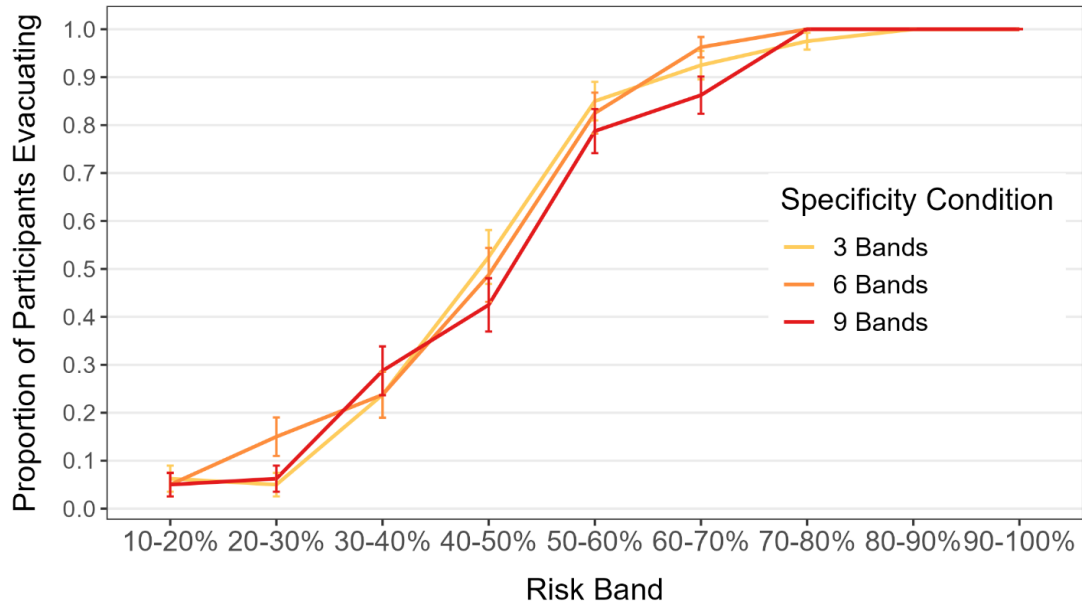
These analyses indicate that the participants' decisions are influenced by their numeracy and graph literacy skills. Although the correlations are quite small, they highlight the importance of individual differences in cognition, which play a role in how people interpret data visualizations.

Does the specificity manipulation matter for the isarithmic maps without lines?

In Experiment 3, we showed participants isarithmic maps without contour lines (i.e., gradient maps). In the specificity manipulations for the standard isarithmic maps, the number of contour lines changed to create three, six, or nine probability bands. However, when there were no contour lines, the only difference between the conditions was the legend, as shown below:



We expected that the legend would have little or no impact on the participants' responses and that their evacuation rates would be very similar at all three levels of specificity. To verify this assumption, we plotted the evacuation rates for each underlying risk level, comparing the three specificity conditions. The results are shown below. As expected, the specificity manipulation had no impact on the participants' evacuation rates in this condition.



The Relationship Between Distance and Perception of Risk

In this experiment the probability of the house being in the burn zone, or risk level, was highly correlated with the house's distance from the fire, as shown in Figure 1. We did not independently manipulate the distance and the risk level. This is fairly realistic because the risk from real-world hazards is often related to one's distance from the hazard. However, we were curious about how much the distance between the house and the center of the fire affected the participants' decisions independent of risk level. To analyze this, we calculated the distance (in pixels) between the center of the X marking the house location and the center of the highest risk band for each base map and level of specificity. We calculated the distance in pixels because the maps used in the experiment did not include a scale linking distance in the map to a real-world measure of distance. We then modeled the relationship between evacuation decisions, risk level, and distance.

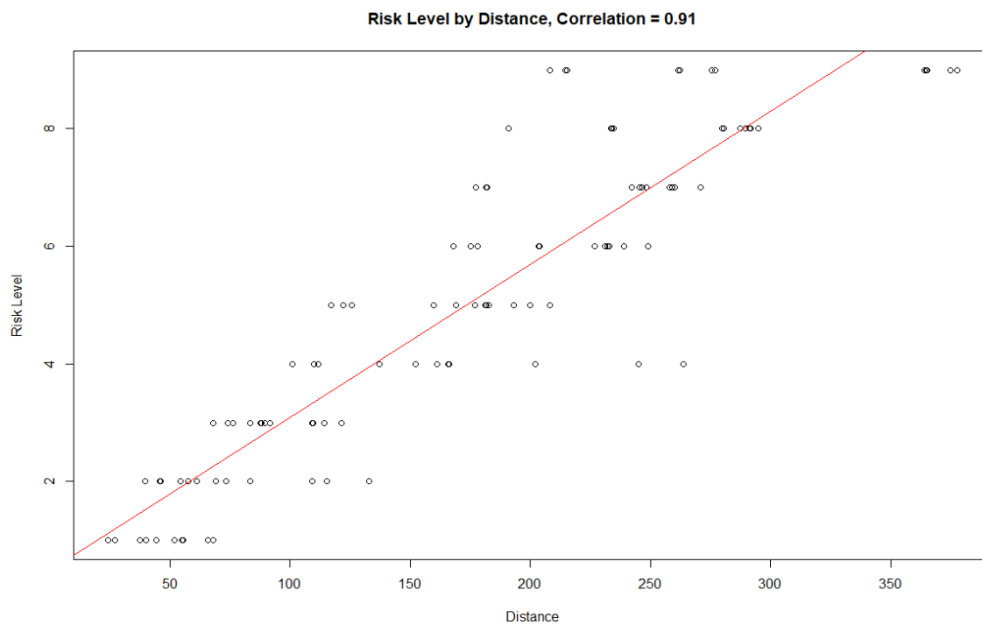


Figure 1. The relationship between the distance (in pixels) between the center of the fire and the house in each base map plotted against the risk to the house in each base map. Here, the underlying probability of the house being in the burn zone is translated to a numerical risk level, with 1 being the highest risk and 9 being the lowest risk. The red line is the regression line from a fitted linear regression model.

Since risk level and distance were highly correlated and had a linear relationship, we chose to model the risk level as a linear function of distance and an unspecified function of other visual features:

$$\text{Risk Level} = \beta * \text{distance} + f(\text{visual features}) + \varepsilon$$

This allowed us to break risk level into a distance component and a component associated with other visual features. The other visual features include the experimental manipulations (the type of visual encoding used, the specificity level, and the number and salience of the visual boundaries between the house and the center of the fire) as well as other factors that were specific to individual stimuli, such as

the overall shape and size of the bands in the hazard map. We can estimate how much distance contributes to the risk level (encapsulated by β) by using a linear regression. The regression line from a fitted linear regression model is shown in Figure 1.

Although distance and risk level were highly correlated, there was also variability within each risk level. For example, in the fourth risk band, which corresponded to a 60-70% probability of the house burning down, the distance from the house to the center of the highest risk band ranged from 101 pixels to 263 pixels. There are also stimuli where the distance is the same, but the visual features of the maps are very different. Figure 2 shows examples of the two stimuli with the same distance but different visual features. When distance is controlled for, we refer to the other factors that could influence the participants' perception of risk as the "residual risk", denoted $f(\text{visual features}) + \varepsilon$ in the equation above. The residual risk variable reflects the y distance from each point in Figure 1 to the regression line. This variable captures the fact that the hazard maps provide information about risk that goes above and beyond distance, and allows us to model the effect of each separately. Residual risk ranged from -3.35 to 3.09 with an average value of 0.00.

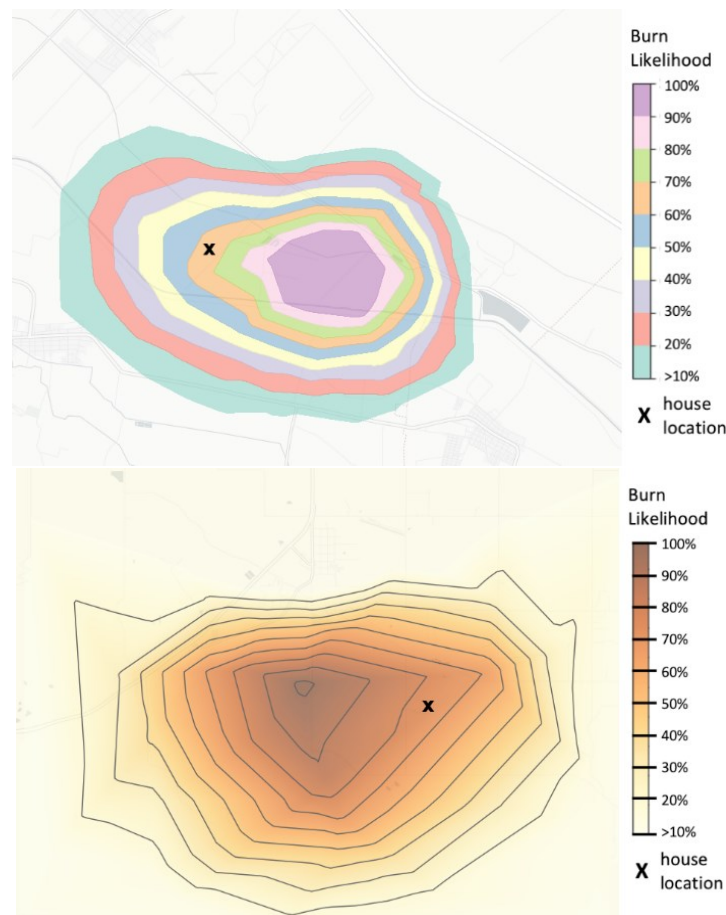


Figure 2. Examples of two different stimuli where distance between the house and the center of the highest risk band is the same (166 pixels in each case). The residual risk is the amount of perceived risk that is "leftover" after accounting for distance. In this example, differences between the background maps, the hazard map overlays, the size and shape of the risk bands and the placement of the house could all contribute to the residual risk.

To model the effect of distance on the participants' decisions, we combined the data from all three experiments, as all three used the same base maps. We used a generalized linear mixed model with a random effect of subject, nested inside another random effect for experiment. This takes the different experiment contexts and the individual propensities of the participants into account, but does not model their association with the outcome directly. The main outcome variable was whether or not the participant chose to evacuate. For this analysis, the decision to stay was encoded as 1 and the decision to evacuate was encoded as 0. Note that this is the opposite of the encoding used to calculate the evacuation rates in the main manuscript. In this case, we changed the binary mapping in order to keep the odds ratios greater than 1 for easier interpretation.

The predictors included in the model were the following:

- Risk level (the underlying probability of the house being in the burn zone)
- Residual risk
- Distance
- Boundaries between¹
- Number of probability bands (corresponding to low-, medium-, or high-specificity)
- Visual encoding of risk (hue, isarithmic, or transparency)

The results are shown in the table below. The first column shows the odds ratio and 95% confidence interval (CI) of a participant choosing to stay based on all of the predictors separately. The second column shows a full model that included all of the predictors together. The second model shows how the associations are modulated by other variables. An interaction between the number of probability bands and the number of visual boundaries was also included in this model. The third column shows what percentage of the total squared error (analogous to variance) is explained by each predictor. This can be thought of as the percent of variability each predictor explains out of the total variability explained by all the predictors.

¹ The “boundaries between” predictor referred to the number of visual boundaries between the house and the center of the hazard map. The number of visual boundaries could be zero, as in the isarithmic maps without lines or in cases where the house was inside the highest risk band. It could be as high as eight when the house was in the lowest risk band in the high-specificity condition. In that case, there were eight changes in hue or transparency or eight contours on the isarithmic maps in between the house and the center of the hazard map, which can be presumed to be the center of the fire.

Variable	Individual Association Odds Ratio (95% CI)	Association Modulated by Other Variables Odds Ratio (95% CI)	Sum of Squared Error Explained %
Risk Level	4.16 (4.00-4.32)		
Residual Risk	1.93 (1.88-1.99)	3.15 (2.92 -3.49)	38.4
Distance (per 10 pixels)	1.36 (1.35-1.37)	1.42 (1.40-1.45)	52.2
Boundaries Between	2.01 (1.97-2.04)		
Number of Bands			
3	Reference		
6	1.08 (1.01-1.15)		
9	1.22 (1.15-1.30)		
Encoding			
Hue	Reference	Reference	1.10
Isarithmic	1.05 (0.96-1.15)	1.20 (1.03 -1.41)	
Transparency	1.35 (1.23-1.47)	2.97 (2.52-3.49)	
Interaction of Number Bands with Boundaries Between			
3 Bands, 0 Boundaries		Reference	8.33
3 Bands, 1 Boundaries		0.29 (0.23-0.37)	
3 Bands, 2 Boundaries		1.67 (1.23-2.27)	
6 Bands, 0 Boundaries		1.15 (0.83-1.59)	
6 Bands, 1 Boundaries		0.63 (0.40-0.99)	
6 Bands, 2 Boundaries		0.36 (0.25-0.52)	
6 Bands, 3 Boundaries		0.75 (0.58-0.96)	
6 Bands, 4 Boundaries		2.19 (1.57-3.04)	
6 Bands, 5 Boundaries		1.02 (0.71-1.47)	
9 Bands, 0 Boundaries		1.3 (1.00-1.91)	
9 Bands, 1 Boundaries		1.36 (0.75-2.47)	
9 Bands, 2 Boundaries		1.27 (0.85-1.89)	
9 Bands, 3 Boundaries		0.98 (0.71-1.34)	
9 Bands, 4 Boundaries		0.91 (0.69-1.20)	
9 Bands, 5 Boundaries		1.39 (1.06-1.84)	
9 Bands, 6 Boundaries		1.66 (1.20-2.28)	
9 Bands, 7 Boundaries		2.79 (1.75-4.46)	
9 Bands, 8 Boundaries		2.72 (1.43-5.15)	

The results show that the odds of the participant choosing to stay increased 1.36 times for every 10 pixels increase in distance between the house and the center of the highest risk band. The odds of a participant choosing to stay increased 1.93 times for every 1 unit increase in residual risk and increased 4.16 times for every one unit increase in raw risk level. The odds of a participant choosing to stay increased 2.01 times for every additional visual boundary included between the house and fire, though there was a noted nonlinearity in this relationship that was addressed in the model with all the variables included. The odds of a participant choosing to stay were 1.08 times higher when there were 6 bands relative to when there were three and 1.22 times higher when there were 9 bands relative to when there were 3. The odds of a participant choosing to stay were 1.35 times higher for transparency maps

relative to hue maps and 1.05 times higher for the isarithmic maps relative to the hue maps. With the exception of the comparison between the hue and isarithmic maps, all of the odds ratios are significant at the $\alpha = .05$ level since the 95% CI does not cross 1.

Comparing the first and second columns shows that the impact of distance on the participants' decisions was modulated by the predictors related to the visual encoding of the risk information. The odds ratio for distance in the second model, where all of the predictors were considered together, was significantly different from the odds ratio for distance in the first model, where the predictors were considered separately. Similarly, the odds ratio for residual risk increased significantly when all of the predictors were included together.

The last row shows the interaction between the number of probability bands and the number of visual boundaries. The results indicate that the association between the number of probability bands and the choice to stay varied depending on the number of visual boundaries between the house and the center of the hazard map.

The third column shows that distance explains the highest percentage of the variability, meaning that it is the most important factor driving the participants' decisions. However, the residual risk also accounts for a large amount of variability, indicating that the visual cues provided by the hazard maps were also an important factor in the participants' choice. The interaction between the number of bands and the number of visual boundaries explained a small but meaningful amount of the variability in the participants' decisions.

The results of this analysis align with the main findings from our experiments: we observed large differences in evacuation rates for the same base maps when the visual cues used to encode the risk information were changed. In this model, these visual cues modulated the residual risk variable, which explained a large amount of the variance in the participants' decisions. This analysis revealed that the distance between the house and the center of the highest risk band (which can be inferred to be the location of the fire) had an even larger impact on the participants' evacuation decisions. However, the impact of distance was modulated by the changes to the visual cues.

The relationship between distance and evacuation decisions helps to explain why the participants' evacuation rates were consistently lower in the visualization conditions than in the text conditions. In the visualizations, the participants were strongly influenced by the distance conveyed by the map, and they modulated their responses accordingly. In the text condition, where the distance information was not available, the participants could not modulate their decisions and seemed to base their decisions on the worst-case scenario (i.e., the upper end of the probability band).