

# [Supplementary] Impact of focus cue presentation on perceived realism of 3-D scene structure: implications for scene perception and for display technology

## 1 Overview

This is a supplementary document for the paper "Impact of focus cue presentation on perceived realism of 3-D scene structure: implications for scene perception and for display technology". This supplementary contains pairwise comparison tables for Experiments 2 (Section 2) and 3 (Section 3) showing the results before converting them to Thurstone's scale values, and the analysis of the impact of removing observer 12 on the results of Experiment 2 (Section 4; this observer showed a different result pattern than the others).

## 2 Experiment 2: pairwise comparison tables

Block 1: Depth separation 0.4  $D$ ; mean luminance 100 cd/m<sup>2</sup>

	Conventional stereo	Near correct	RetinalBlur	ChromaBlur	Low-resolution	Zero disparity	Low-contrast
Conventional stereo	-	52 (50)	63.6 (44)	75 (36)	53.2 (47)	77.1 (35)	48.1 (52)
Near correct	48 (50)	-	64.3 (42)	73 (37)	63.3 (49)	81.2 (32)	53.1 (49)
RetinalBlur	36.4 (44)	35.7 (42)	-	55.8 (52)	46.8 (47)	61.5 (39)	41.5 (41)
ChromaBlur	25 (36)	27 (37)	44.2 (52)	-	28.3 (46)	60 (45)	19.4 (36)
Low-resolution	46.8 (47)	36.7 (49)	53.2 (47)	71.7 (46)	-	69.8 (43)	42 (50)
Zero disparity	22.9 (35)	18.8 (32)	38.5 (39)	40 (45)	30.2 (43)	-	26.3 (38)
SDR	51.9 (52)	46.9 (49)	58.5 (41)	80.6 (36)	58 (50)	73.7 (38)	-

Block 2: Depth separation 0.4  $D$ ; mean luminance 1 cd/m<sup>2</sup>

	Conventional stereo	Near correct	RetinalBlur	ChromaBlur	Low-resolution	Zero disparity	Low-contrast
Conventional stereo	-	47.9 (48)	56.5 (46)	62.9 (35)	74.5 (51)	58.3 (36)	57.1 (49)
Near correct	52.1 (48)	-	62.8 (43)	70.3 (37)	66 (50)	89.3 (28)	65.2 (46)
RetinalBlur	43.5 (46)	37.2 (43)	-	70.2 (57)	34.8 (46)	66.7 (42)	38.6 (44)
ChromaBlur	37.1 (35)	29.7 (37)	29.8 (57)	-	33.3 (36)	68.8 (48)	35.1 (37)
Low-resolution	25.5 (51)	34 (50)	65.2 (46)	66.7 (36)	-	81.1 (37)	44.2 (52)
Zero disparity	41.7 (36)	10.7 (28)	33.3 (42)	31.2 (48)	18.9 (37)	-	26.2 (42)
SDR	42.9 (49)	34.8 (46)	61.4 (44)	64.9 (37)	55.8 (52)	73.8 (42)	-

Block 3: Depth separation 0.6  $D$ ; mean luminance 100 cd/m<sup>2</sup>

	Conventional stereo	Near correct	RetinalBlur	ChromaBlur	Low-resolution	Zero disparity	Low-contrast
Conventional stereo	-	43.8 (48)	41 (39)	57.1 (42)	51.2 (43)	85 (40)	52.4 (42)
Near correct	56.2 (48)	-	46.3 (41)	63.4 (41)	66.7 (45)	71.4 (28)	53.5 (43)
RetinalBlur	59 (39)	53.7 (41)	-	72.1 (43)	59 (39)	74.2 (31)	50 (38)
ChromaBlur	42.9 (42)	36.6 (41)	27.9 (43)	-	53.3 (45)	74.3 (35)	59.5 (42)
Low-resolution	48.8 (43)	33.3 (45)	41 (39)	46.7 (45)	-	88.6 (35)	52.3 (44)
Zero disparity	15 (40)	28.6 (28)	25.8 (31)	25.7 (35)	11.4 (35)	-	16.7 (36)
SDR	47.6 (42)	46.5 (43)	50 (38)	40.5 (42)	47.7 (44)	83.3 (36)	-

Table 1: The results of pairwise comparison trials in Experiment 2, aggregated across all participants, each table corresponding to a separate block of the experiment with a different mean luminance and depth separation. Each cell shows two values: the first value is the percentage of times in which the condition corresponding to the row was selected over the condition corresponding to the column (in terms of better depth realism). The second value shown in parenthesis is the cumulative number of comparisons (across all observers) performed for this pair of conditions.

## 3 Experiment 3: pairwise comparison table

	Conventional stereo	Near correct	Varifocal	Varifocal RetinalBlur	Varifocal ChromaBlur
Conventional stereo	-	49.1 (116)	57 (121)	65.3 (118)	67.9 (84)
Near correct	50.9 (116)	-	55.1 (118)	66.1 (121)	52.1 (71)
Varifocal	43 (121)	44.9 (118)	-	62.2 (119)	72.7 (110)
Varifocal RetinalBlur	34.7 (118)	33.9 (121)	37.8 (119)	-	84.5 (142)
Varifocal ChromaBlur	32.1 (84)	47.9 (71)	27.3 (110)	15.5 (142)	-

Table 2: The results of pairwise comparison trials in Experiment 3, aggregated across all participants. The notation is the same as in Table 1.

## 4 Analysis of the impact of observer 12 in Experiment 2

We note from our analysis of individual data that in Experiment 2 the responses of observer 12 indicate selecting all conditions in which the non-fixated object appeared blurry as more realistic than with conventional stereo presentation. While we cannot determine the strategy observer 12 used when selecting the most realistic condition (due to the lack of a foil condition in Experiment 2, some observers in Experiment 1 used the presence of (unrealistic) blur as a proxy for realism and were removed from the analysis of this experiment as a result. Here, we show the impact of removing observer 12 from our analysis of Experiment 2. We found that removing observer 12 has small effect on the overall findings of the experiment.

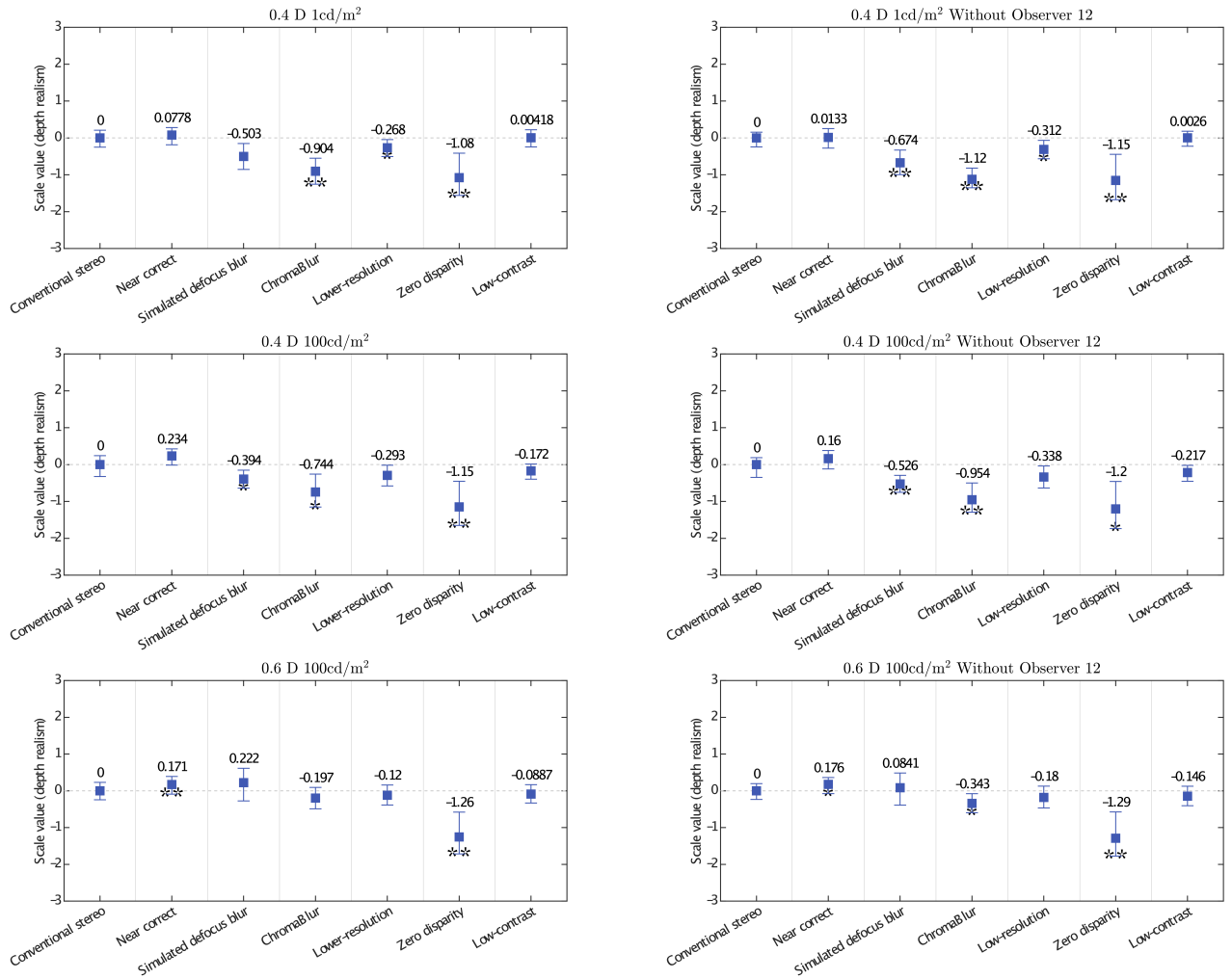


Figure 1: The results of Experiment 2 for the three blocks (rows) when Observer 12 is included (left column) and is excluded (right column).