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Supporting Online Material for

The Visual Impact of Gossip

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Corrected 17 June 2011: In Table S1 "neutral social" sentences were incorrectly reported and have been replaced with the correct sentences.

Supplemental Online Materials

Materials and Methods

Study 1

Method

Participants. Participants were 66 (16 male) Boston College students ranging in age from 18 to 24 (M = 19.68 years, SD = 1.19). One additional participant did not complete the experiment and was excluded from analysis. Degrees of freedom for some analyses vary because of missing data (for some comparisons, participants reporting only blended percepts were dropped from analysis). Seven participants failed to comply with the face rating instructions by responding with invalid keys and were excluded from the face rating analysis only, so 59 participants were included in the face rating analysis. All participants reported normal or corrected-to-normal acuity and were naïve to the purpose of the experiment. Individuals wearing glasses were excluded from this experiment because glasses interfere with the proper function of the stereoscope. Participants received one departmental research credit or $10 for participating.

Materials and Procedure. Instructions and stimuli were presented using E-Prime Version 2 running on a Dell Optiplex 725 and a 17-inch Dell LCD flat-screen monitor (1280 X 1024). Participants sat with their head fixed with a chin rest and viewed stimuli through a mirror stereoscope at a distance of approximately 55 cm.

During the *learning phase*, participants viewed 30 structurally neutral faces. Each face was paired with one sentence describing a negative social behavior (e.g., “threw a chair at his classmate”), a positive social behavior (e.g., “helped an elderly woman with her groceries”), or a neutral social behavior (e.g., “passed a man on the street”). Ten faces were paired with a negative behavior, 10 faces were paired with a positive behavior, and 10 faces were paired with a neutral behavior. Participants were told to imagine each target person performing the behavior described in the corresponding piece of gossip (*3,* see Table S1 for a complete list of the sentences). Face-gossip pairings were counterbalanced across participants. Each face-sentence pair was displayed on the computer screen for five seconds with a 300 ms inter-trial interval. Each face-sentence pair was presented four times in random order. The valence of the sentence was counterbalanced between participants such that across three versions of the task, each face was paired with each type of sentence.

On each trial of the *binocular rivalry phase*, participants were presented with a photograph of a neutral face to one eye and a photograph of a house to the other eye (counterbalanced across trials). All stimuli were matched on luminance and contrast to a single face target using Adobe Photoshop CS2’s color match tool. Rivalrous stimuli subtended approximately 1.3 X 1.7 degrees of visual angle which pilot work showed is large enough to clearly perceive the stimuli but small enough to reduce blended percepts (*S1*). A frame was placed around each stimulus to facilitate fusion of the two images. Each trial began with a 1 second fixation immediately followed by the 10 second face-house pair presentation. There was a 2 second interval between each trial. Although this inter-trial interval was shorter than is found in some binocular rivalry studies (*19, 21),*

and leaves open the potential for one trial to influence another, trial types (neutral faces previously paired with negative, positive, or neutral gossip, or novel neutral faces) were randomly presented and so any trial-to-trial carry over effects was treated as error variance.

Participants were instructed to focus on the central fixation point and to press and hold the '*a*' key when they perceived a face, '*l*' when they perceived a house, and to hold down both keys if they saw both a house and a face or a blend of the two (response keys were counterbalanced across participants). They were instructed to keep their fingers on the keys at all times during the task and were given a practice block of 30 trials at the beginning of the experiment. During the test phase, each face-house pair was presented only once. Participants saw all 30 neutral faces from the gossip manipulation plus an additional 10 novel neutral faces from the same face set (to control for the mere exposure effect, *S2*) for a total of 40 trials.

Following the binocular rivalry task, participants rated the 40 target faces as negative, neutral, or positive. Participants were instructed to make quick "snap" judgments about each face that was displayed until the participant responded using labeled keys on a standard keyboard.

Data Reduction. For each individual observer, we calculated the mean duration during which structurally neutral faces (previously paired with negative, neutral, or positive gossip, or novel faces) were seen across trials (mean face dominance duration). We computed a mean house duration reflecting the time during which a house was seen (this is equivalent to the index of mean face suppression duration when blended percepts are removed). Percepts occurring at the end of each trial were eliminated from the average because they were artificially shortened by the end of a trial. Both face dominance durations and face suppression durations adhered to a normal distribution and therefore were not transformed. To explore the other potential effects of gossip on binocular rivalry, we also calculated the percentage of trials for which the face was the first percept and the alternation rate (mean number of percepts seen per trial). Very brief percepts (less than 100 ms) were excluded from all analyses because we took them to reflect slight differences in reaction time for pressing or releasing both keys to report blended percepts. As in most prior binocular rivalry studies (*11*), there was a fairly high incidence of blended percepts (38.4% of total viewing time).

Study 2

Method

Participants. Participants were 51 (17 male) Boston College students ranging in age from 18 to 24 (M = 20.14 years, SD = 1.64). Nine participants were disqualified from the experiment because they did not learn to threshold (60%) after five attempts through the learning and testing phase. Inclusion criteria were the same as Study 1. Participants received one and a half departmental research credits or $15 for participating.

Materials and Procedure. Materials and Procedure were the same as Study 1 except that 15 faces were paired with gossip (five each paired with negative, positive, or neutral social sentences) and 15 faces were paired with non-social affective information (five each with negative, positive, or neutral non-social sentences, such as "had a root

canal performed" (negative), "felt the warm sunshine" (positive), or "drew the curtains in the room" (neutral) (see Table S1 for complete list of sentences). After the learning phase, participants completed a test phase where they explicitly evaluated each face. If participants correctly evaluated at least 60% of the faces according to the valence of the prior sentence then they proceeded to the binocular rivalry phase. If they failed to reach the 60% threshold, they repeated the entire learning phase and then were tested again. Participants ran through the learning phase a maximum of five times. If they failed to reach the 60% threshold after their fifth try, they were dismissed from completing the rest of the experiment. On average, participants completed the learning phase 2.65 times (SD = .97).

Participants completed an identical *binocular rivalry phase* as in Study 1. However, unlike Study 1, participants were not given a practice block of trials at the beginning of the experiment. As in Study 1, during this test phase, each face-house pair was presented only once. Participants saw all 30 neutral faces from the gossip manipulation plus an additional 10 novel neutral faces from the same face set for a total of 40 trials.

Data Reduction. Data reduction was identical to Study 1.

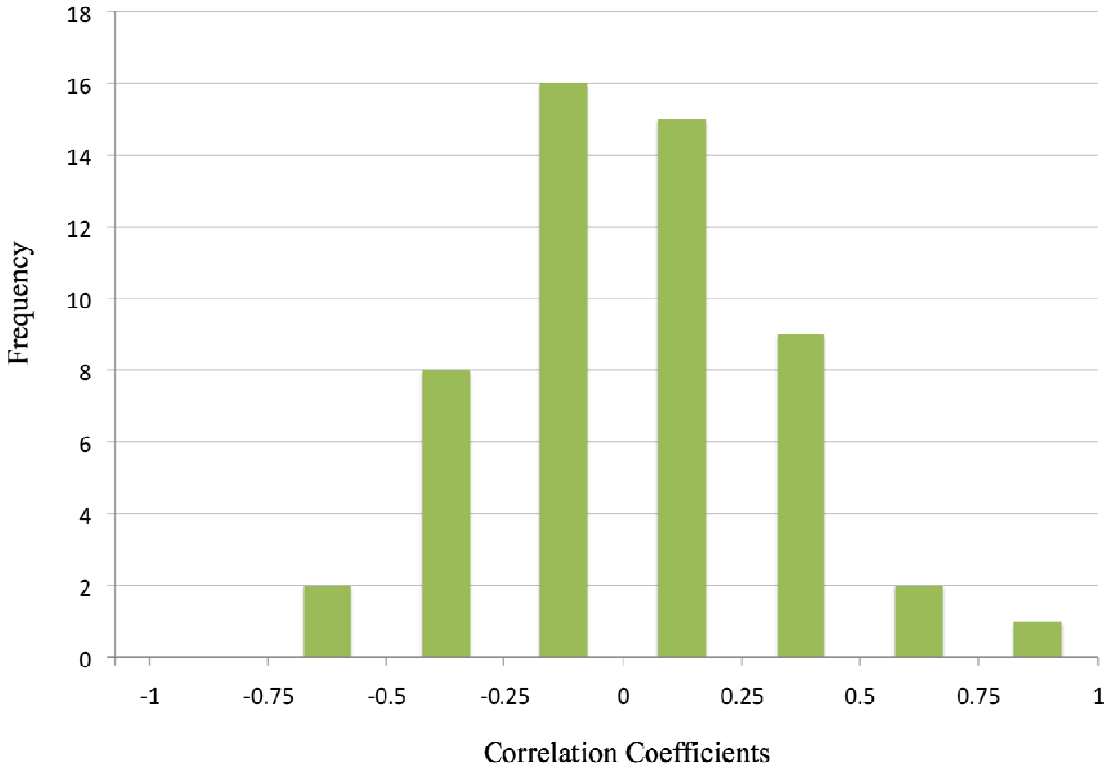
Additional Results

In Study 2, faces dominated in visual consciousness for significantly shorter durations than in Study 1, even though the trial length was the same (10 sec). In Study 2, percepts (faces and houses) alternated in consciousness more frequently (M = 4.13, SD = 2.41) than in Study 1 (M = 2.63, SD = 1.45), $t(115) = 4.16$, $p < .001$ (Table S2). Given the increased time it took to complete the entire binocularly task in Study 2 (relative to Study 1), participants reported seeing blended percepts for more time in Study 2 (46.4% of total viewing time) than in Study 1 (38.4%). Importantly, when we examined the total number of resolved percepts (time participants only saw a face or only saw a house) the *proportion* of time in which a face dominated in consciousness did not differ between the samples ($p < .37$).

Replicating prior studies in our lab (*2*), a repeated measures ANOVA demonstrated that the gossip manipulation in Study 1 influenced the explicit evaluation of the structurally neutral faces, $F(3, 174) = 8.02$, $p < .001$ (Table S3). Follow-up paired t-tests revealed that faces previously paired with negative gossip were rated as more negative than were faces paired with neutral gossip ($p < .003$), positive gossip ($p < .001$), or novel faces never paired with gossip ($p < .03$). The explicit ratings of faces previously paired with positive gossip did not differ from faces paired with neutral gossip ($p < .3$), however, suggesting that either positive learning did not occur or that faces paired with neutral stimuli were perceived to be more positive than neutral (perhaps due to a mere exposure effect; simply being familiar with a neutral stimuli leads it to be perceived more positively when compared to completely novel stimuli; *S2*). The latter explanation is likely, given that faces previously paired with positive gossip and neutral gossip were rated as more positive than were novel faces ($p < .02$ and .09, respectively).

Figures and Legends

Figure S1. *Frequency of Correlations Reflecting the Relation Between Face Ratings and Face Dominance Durations in Study 1.*



Note. Pearson correlation coefficients were calculated for each participant's explicit evaluations of the structurally neutral faces and the dominance duration of those faces during the binocular rivalry phase. On average, there was no relationship between how participants rated the faces and how long those faces were perceived.

Tables and Legends

Table S1. *Sentences used in Studies 1 and 2.*

Valence of Information	Social	Non-Social
Negative	hit a small child	became sick with the flu
	made a racist comment	missed a flight
	defecated on the crowded street	had a root canal performed
	lost all of the company money	got lost in the desert
	fired an employee before Christmas	walked up eight flights of stairs
	threw a chair at his classmate$_a$	
	crashed a friend car$_a$	
	lied to the investigator about the crime$_a$	
	abandoned a partner$_a$	
	cursed at the flight attendant$_a$	
Positive	helped the blind man pick out items in the grocery store	smelled fresh baked cookies
	picked up friend at the airport after a long trip	felt the warm sunshine
	tutored a struggling classmate for free	saw the sunset over the ocean
	surprised significant other at work with flowers	read fantastic new book
	gave up seat on the bus to a pregnant lady	found $20 in a pocket
	read a book out loud to residents of a nursing home$_a$	
	threw a surprise birthday party for a parent$_a$	
	helped an elderly woman with her groceries$_a$	
	bought ice cream for a young child on a sunny day$_a$	
	cooked a fabulous dinner for spouse$_a$	

Neutral	asked the gas station attendant to pump gas	drank a glass of water
	rode the elevator with a coworker	drew the curtains in the room
	sat next to a woman on the train	locked the door to the house
	asked the doorman for directions	left shoes on the doormat
	asked the instructor for a pencil	stapled two pieces of paper together
	drove to someone's house$_a$	
	asked the store owner about a product on the shelf$_a$	
	passed a man on the street$_a$	
	saw a person across the room$_a$	
	read a story about the mayor$_a$	

Note. The first five social sentences listed of each valence (negative, positive, and neutral) were used in both Study 1 and Study 2. The remaining five social sentences were used only in Study 1. Non-Social sentences were used only in Study 2.

Table S2. *Mean Dominance Duration of Faces, Houses, Blended Percepts and Mean Number of Alternations per Trial +/- Standard Error*

	Sentence Type	Face	House	Blend	Alternation Rate
Study 1					
	Negative	4861 (380)	4220 (371)	5123 (349)	2.121 (0.158)
	Neutral	4340 (361)	4448 (379)	5089 (333)	2.059 (0.138)
	Positive	4348 (354)	4149 (388)	5067 (349)	2.157 (0.156)
	Novel	4310 (337)	4197 (354)	4871 (364)	2.143 (0.152)
Study 2					
Social	Negative	2507 (361)	1437 (263)	2071 (256)	4.022 (0.374)
	Neutral	2102 (259)	1352 (227)	2244 (374)	4.000 (0.356)
	Positive	1983 (266)	1362 (234)	1864 (224)	4.026 (0.355)
Non-Social	Negative	1649 (163)	1246 (146)	2201 (296)	4.047 (0.342)
	Neutral	1769 (179)	1430 (226)	2165 (285)	4.177 (0.364)
	Positive	1736 (184)	1312 (182)	1966 (273)	4.159 (0.347)
	Novel	1942 (184)	1251 (136)	1828 (222)	4.254 (0.378)

Note. All dominance values are presented in milliseconds. Standard errors are given in parentheses. Face dominance time was the variable of interest. In Study 1, the N in each cell ranged from 57 to 66. In Study 2, the N in each cell ranged from 32 to 41. Sample sized within each cell varied because some participants were missing data in some cells. Alternation rate refers to the number of times percepts switch in consciousness over the course of a 10-second trial.

Table S3. *Explicit Affective Ratings of Faces Based on Sentence Type in Study 1*.

Sentence Type	Face Rating
Negative	1.73 (.038)
Neutral	1.93 (.048)
Positive	1.98 (.046)
Novel	1.83 (.036)

Note. Standard errors are given in parentheses. Participants were instructed to make quick "snap" judgments about each face and response options were coded as negative = 1, neutral = 2, or positive = 3.

References

S1. R. Blake, R. P. O'Shea, T. J. Mueller, *Vis. Neurosci.* **8**, 469-478 (1992).

S2. R. B. Zajonc, *Curr. Dir. Psychol. Sci.* **10**, 224-228 (2001).