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What is This?
Confuse Your Illusion: Feedback to Early Visual Cortex Contributes to Perceptual Completion

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Abstract
A striking example of the constructive nature of visual perception is how the human visual system completes contours of occluded objects. To date, it is unclear whether perceptual completion emerges during early stages of visual processing or whether higher-level mechanisms are necessary. To answer this question, we used transcranial magnetic stimulation to disrupt signaling in V1/V2 and in the lateral occipital (LO) area at different moments in time while participants performed a discrimination task involving a Kanizsa-type illusory figure. Results show that both V1/V2 and higher-level visual area LO are critically involved in perceptual completion. However, these areas seem to be involved in an inverse hierarchical fashion, in which the critical time window for V1/V2 follows that for LO. These results are in line with the growing evidence that feedback to V1/V2 contributes to perceptual completion.

Keywords
visual perception, consciousness, cognitive neuroscience, object recognition

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In daily life, the constructive and creative nature of visual perception becomes apparent when visual information is only partially available because of occlusion. Although objects in the environment are frequently occluded, people do not experience the world as a collection of fragmented surfaces or incomplete objects. To overcome occlusion, the visual system goes beyond given physical properties and seems to effortlessly fill in absent information and complete missing contours (Montaser-Kouhsari, Landy, Heeger, & Larsson, 2007; Seghier & Vuilleumier, 2006). This completion of contours (perceptual completion; Pessoa, Thompson, & Noë, 1998) has often been studied using Kanizsa-type illusory figures (Kanizsa, 1976); this type of illusion induces the percept of a coherent figure when only partial contours are present. For example, in a Kanizsa square (see Fig. 1a), four notched circles (inducers) are arranged such that the notches induce a square shape.

A long-debated issue has been how different levels of visual processing contribute to perceptual completion (Harris, Schwarzkopf, Song, Bahrami, & Rees, 2011; Lee & Vecera, 2005; Moore, Yantis, & Vaughan, 1998; M. M. Murray et al., 2002; Rensink & Enns, 1998; von der Heydt, Peterhans, & Baumgartner, 1984). It has been hypothesized that perceptual completion arises at an early stage of visual processing in low levels of the visual cortical hierarchy (Davis & Driver, 1998). Neural activity related to illusory figures has been found in V2 (Ramsden, Hung, & Roe, 2001; von der Heydt et al., 1984) and even as early as V1 (Halgren, Mendola, Chong, & Dale, 2003; Lee & Nguyen, 2001; Maertens & Pollmann, 2005; Ramsden et al., 2001; but see Qiu & von der Heydt, 2005). Alternatively, the process of perceptual completion may depend on higher-level mechanisms, as Harris and her colleagues (2011) demonstrated recently. They showed that without awareness of the spatial context created by the inducers of a Kanizsa-type figure, the percept of the illusory figure is completely abolished, which suggests the necessity of extensive integration of contextual information during perceptual completion. The notion of the involvement of higher-level mechanisms has been further supported by results from imaging studies reporting the strongest responses to illusory figures in higher visual areas, such as the lateral occipital (LO) area, which is known to be highly involved in object perception.
Taking these findings together, there seems to be no evidence for the exclusive involvement of lower-level or higher-level mechanisms in perceptual completion; instead, completion seems to depend on the interaction between different levels of visual processing. In this view, an important role for feedback processing during perceptual completion has been suggested (Halgren et al., 2003; Harris et al., 2011; M. M. Murray et al., 2002). From such a perspective, perceptual completion may follow an inverse hierarchical path in which objects are first detected by high-level areas, such as LO; early visual cortex (V1/V2) is necessary at a relatively late stage to fill in details, complete the figure percept, or receive predictive signals from higher visual areas (Hochstein & Ahissar, 2002; Lamme, 2003; Rao & Ballard, 1999).

In the experiment reported here, we used navigated transcranial magnetic stimulation (TMS) to test at what stage of visual processing perceptual completion takes place and whether feedback to early visual cortex causally contributes to perceptual completion. Therefore, we briefly disrupted ongoing activity in early visual cortex (V1/V2) and in higher-level visual area LO in an early, an intermediate, and a late time window while participants performed an illusory-figure-discrimination task (Fig. 1c). We expected activity in V1/V2 to be necessary after the involvement of LO, which would support the hypothesis that feedback signaling to early visual cortex contributes to perceptual completion. In addition, we manipulated the perceptual strength of the illusory figure (Shipley & Kellman, 1992) to investigate whether this would alter the disruptive effect of TMS on task performance.

**Method**

**Participants**

Nine undergraduate psychology students of the University of Amsterdam (8 females, 1 male; mean age = 22.3 years; range = 19–24 years) gave written informed consent to
participate in the experiment. All 9 students were financially compensated for their participation. All had normal or corrected-to-normal vision and were naive to the purpose of the experiment. Participants had no history of neurological diseases or other risk factors and were screened beforehand according to international guidelines (Wassermann, 1998).

**Stimuli**

The stimuli for our illusory-figure-discrimination task consisted of two sets of four dark gray inducers (30.7 cd/m²) presented against a light gray background (48.4 cd/m²; Fig. 1c). One set was positioned at the lower left and one set was placed at the lower right of a centrally positioned fixation dot. The configuration of the inducers on only one side of the fixation dot formed an illusory contour of a square (3.23°). In the opposite set, the inducers were rotated 22.5°, such that the illusory contours were somewhat curved, and no square was visible (Fig. 1b). To explore the impact of the perceptual strength of the illusory square on the disruptive effect of TMS, we varied the size of the inducers. By altering the size of the inducers, we manipulated the support ratio (the ratio between physically presented and induced contours), presenting ratios of 30% (visual angle of 0.91°), 20% (visual angle of 0.65°), and 10% (visual angle of 0.40°) without changing the distance between the inducers (3.23°). Reducing the support ratio decreased the strength of the illusory figure.

Stimuli were presented on a 17-in. Dell thin-film-transistor (TFT) monitor with a refresh rate of 60 Hz. Participants were placed approximately 90 cm in front of the monitor so that each centimeter on the monitor subtended a visual angle of 0.64°. Stimuli were presented using Presentation software (Neurobehavioral Systems, Albany, CA).

**Procedure**

All procedures were approved by the ethics committee of the psychology department of the University of Amsterdam. On each trial, stimuli were presented for approximately 83 ms (five frames) followed by an interstimulus interval of 1,500 ms (jittered between 1,450 ms and 1,700 ms in steps of 50 ms) containing only the fixation dot. Before each session, participants were instructed to indicate as accurately as possible on which of the two sides they perceived an illusory square by pressing a button with their right or left index finger (the correct response was always congruent with the target side). When participants failed to see an illusory square, they were instructed to guess on which side the illusory square was presented (two-alternative forced-choice task). Participants were not explicitly instructed to note the rotation of the inducers and were directed to fixate the central dot throughout the task (see M. M. Murray, Imber, Javitt, & Foxe, 2006). Reaction times (RTs) below 100 ms and greater than 1,500 ms were excluded from all analyses.

To disrupt performance during the illusory-figure-discrimination task, we applied TMS over V1/V2 or bilaterally over LO at different moments in time after stimulus presentation (see the following section for details). Data were gathered for each participant in two to three sessions. Each participant separately received V1/V2 and LO stimulation. The order of TMS target location was randomly assigned (4 participants started with V1/V2 stimulation, and 5 participants started with LO stimulation). A session started with one practice block so participants could get accustomed to the task in combination with TMS at the specific location of that session. Sessions were separated from each other by at least 6 days. In each session, there were five experimental blocks; each block contained 96 trials. Within each block, the side on which the illusory square was presented, the support ratio, and TMS timing were randomized and equally probable. By using an fMRI-guided navigation system (Visor; Advanced Neuro Technology, Enschede, The Netherlands), we were able to monitor whether the TMS coil changed position during a block. If displacement of the coil exceeded 0.5 cm, we discarded data obtained during that block from further analysis. In such cases, an additional third session was necessary because we did not perform more than five experimental blocks during one session. Because of technical difficulties, one experimental block from 1 participant was not recorded properly and was excluded from analysis.

**TMS**

To disrupt activity in early visual cortex and LO, we used two Magstim Rapid² (Magstim, Carmarthenshire, United Kingdom) stimulators in combination with a 90-mm circular coil (for V1/V2 stimulation) and two 70 mm figure-of-eight coils (for bilateral LO stimulation). Both types of coils have proven to be effective for targeting the specific regions we assigned them to (Koivisto, Railo, Revonsuo, Vanni, & Salminen-Vaparanta, 2011; Ro, Breitmeyer, Burton, Singhal, & Lane, 2003). The design of our experiment made it necessary to disrupt both the left and right visual fields. When targeting the relatively large region of early visual cortex, we therefore used the base of a circular coil. However, a circular coil would not be focal enough to disrupt processing in LO, so we used two figure-of-eight coils (bilaterally). We disrupted processing in early visual cortex by administering a double pulse (45 Hz) over V1/V2 (Fig. 1d). Double-pulse TMS makes use of the accumulative nature of the single-pulse TMS effect, creating a broader time window of disruption (depending on the interval between the pulses; here, ~23 ms). At the same time, double-pulse TMS keeps the high temporal resolution associated with single-pulse TMS (see Walsh & Pascual-Leone, 2003) in comparison with other TMS protocols (such as repetitive TMS).

For LO stimulation, a single pulse was applied simultaneously and bilaterally over left and right LO (Fig. 1e). We chose not to use a double pulse when bilaterally stimulating LO...
because that would have resulted in the administration of four pulses in a very brief time interval, hence becoming similar to repetitive TMS. Because both single-pulse and double-pulse TMS allow for a temporal resolution sufficient for the purposes of the current experiment, we have no reason to believe that the use of two different TMS protocols confounded our results (see also Silvanto, Lavie, & Walsh, 2005).

When bilaterally stimulating LO, we placed the coils tangentially to the subject’s head using the fMRI-guided Visor navigation system. Navigation was based on functional LO mapping of each participant—mean Montreal Neurological Institute (MNI) coordinates for right LO: $x = 43, y = -75, z = -10$; mean MNI coordinates for left LO: $x = -42, y = -77, z = -8$ (we used subject-space coordinates for navigation). For V1/V2 stimulation, we centrally positioned the base of a 90-mm-diameter circular coil approximately 1.5 cm above the inion (Ro et al., 2003), with the orientation of the axis of the coil parallel to the transverse plane (handle pointing to the right; mean MNI coordinates: $x = -2, y = -96, z = 4$). The mean minimal distance (in a straight line) between right LO and V1/V2 was 46 mm (left LO to V1/V2 = 45 mm). In reality, this distance was always bigger because the skull is spherical in shape. Although early visual cortex is in the relative vicinity of LO, TMS has been proven to have enough spatial specificity to allow for LO- and V1/V2-specific TMS effects (Koivisto et al., 2011). In addition, the minimal distance does not violate the spatial specificity of TMS (occipital TMS has been shown to have a spatial resolution of ~10 mm; see Kammer, 1999). During the stimulation, participants placed their head in a chin rest (Rogue Research, Montreal, Quebec, Canada) for optimal stability; the chin rest had holders to fixate the coils.

Before starting the experiment, we determined the phosphene thresholds of each participant: While participants fixated on a black screen in a dimly lit room, we increased stimulator output while targeting V1/V2 until 50% of the pulses resulted in the perception of a phosphene. When we stimulated V1/V2, we optimized location of the coil in such a way that the phosphene covered the area where the stimuli were presented. A stimulation intensity of approximately 85% of phosphene threshold was used during the experimental and practice blocks.

We began TMS stimulation at early (100 ms), intermediate (160 ms), and late (240 ms) time windows after display onset to determine the temporal sequence of contributions of early visual cortex and LO during our task. TMS time windows were based on previous literature showing neural correlates of perceptual completion in these time windows (Halgren et al., 2003; M. M. Murray, et al., 2002). In each session, stimuli were also presented without applying TMS, which created a total of four TMS conditions per target location. We did not include a sham or a standard control-site condition (e.g., vertex stimulation) because we expected the timing of stimulation to be specific for each location, thus intrinsically controlling for alternative effects of TMS (e.g., the sound or cutaneous stimulation).

LO mapping with functional MRI (fMRI)

To bilaterally target LO with TMS, we used the Visor system. This system uses functional and structural MRI data from each participant individually to accurately position the center of the coil over the desired cortical region. Therefore, we functionally mapped area LO using fMRI by presenting pictures of faces, houses, objects (bottles, chairs, and scissors) and phase-scrambled versions of the objects every 2 s in blocks lasting 16 s each. Every block was presented four times. Predictors were created by convolving the onset times of the stimuli from the different categories with a model of the hemodynamic response function and fitting these to the data with the general linear model. To determine the location of LO, we contrasted activations in response to unscrambled houses, faces, and objects with activations in response to scrambled objects (Grill-Spector & Malach, 2004). We further specified LO by subtracting activations in the overlapping regions of the fusiform face area (faces > houses and objects) from activations in the parahippocampal place area (houses > faces and objects).

Blood-oxygen-level-dependent MRI (gradient echo echo-planar imaging, transverse slice orientation, repetition time = 2,000 ms, echo time = 28 ms, field of view = 200 mm, matrix size = 112 × 112 pixels, slice thickness = 2.5 mm, slice gap = 0.3 mm, 28 slices, and a sense factor of 2.5) was recorded during presentation of stimuli (Philips, Achieva 3T). Stimuli were projected on a screen at the rear end of the scanner table, and subjects viewed the stimuli via a mirror placed above their head. The functional images were motion corrected, slice time aligned, temporally smoothed with a Gaussian filter (full-width half-height of 2.8 s), and high-pass filtered (0.01 Hz) in the temporal domain without spatial smoothing. The functional images were aligned to the structural image acquired at the end of each scanning session (T1 turbo field echo, 182 coronal slices, fractional anisotropy = 8, echo time = 4.6 ms, repetition time = 9.7 ms, slice thickness = 1.2 mm, field of view = 250 mm, matrix = 256 × 256 pixels).

Behavioral analysis

We expected TMS to have a differential effect at different time windows depending on the location of stimulation. If feedback signaling is critical for processing of illusory squares, TMS applied over V1/V2 should affect performance at a later time window relative to LO stimulation. In addition, we explored the effect of perceptual strength of the illusory figure on TMS disruption during the illusory-figure-discrimination task.

Results

To test the effect of TMS target location on TMS time windows, we performed two 2 (TMS location: LO, V1/V2) × 4 (TMS time window: none, 100–122 ms, 160–182 ms, 240–262 ms) repeated measures analyses of variance (ANOVA)s
on accuracy and RT, respectively. For accuracy, we found a significant interaction between TMS time window and TMS location, $F(3, 24) = 6.0, p = .003$, which showed that the moment when TMS affected performance differed depending on the location of the stimulation (LO or V1/V2). We found no main effects of TMS location, $F(1, 8) = 0.05, p = .83$, or TMS time window, $F(3, 24) = 1.19, p = .33$.

To find out how perceptual strength interacted with disruption by TMS, we separated the three support ratios using three repeated measures ANOVAs (TMS time window × TMS location). A significant interaction was found for the largest support ratio (Fig. 2a), $F(3, 24) = 4.3, p = .015$. This interaction effect was not found for the medium support ratio, $F(3, 24) = 2.7, p = .066$ (Fig. 2b), or the smallest support ratio, $F(3, 24) = 0.1, p = .93$ (Fig. 2c). These findings suggest that the differential effect of TMS timing depending on TMS target location was evident only for the strong support ratio, which created a strong Kanizsa-type percept.

For the largest support ratio, we decomposed the interaction between TMS time window and TMS target location using two-tailed post hoc t tests. As Figure 2a shows, the decrease in performance depended on the timing of TMS but did so differentially per TMS target site. When TMS was applied over LO, performance scores were lower in the early time window (100–122 ms) than in all other TMS time windows, all $ts(8) > 3.1$, all $ps < .014$. In contrast, stimulation in the intermediate TMS time window (160–182 ms) affected performance scores when stimulation was applied over V1/V2—no TMS vs. intermediate TMS: $t(8) = 2.4, p = .042$; early TMS vs. intermediate TMS: $t(8) = 2.5, p = .038$; late TMS vs. intermediate TMS: $t(8) = 1.53, p = .17$. These results show that a time window critical for perceptual completion in V1/V2 followed the time window in which activity in higher-level visual area LO was necessary.

We found a significant interaction effect exclusively when a strong illusory square was presented. This finding suggests that the activity we disrupted was strongly related to the percept of the illusory square. To further explore this hypothesis, we examined the relationship between correct detection of the illusory percept (reflected in performance scores) and the TMS effect—that is, with low performance scores (decreased perceptual strength), reduced TMS effects were expected. We therefore performed post hoc correlational analyses for the strong and medium support ratios. Although we did not find a significant interaction effect for the medium support ratio, we included this ratio because performance scores were still well above chance.

For the correlational analyses, we focused on the two critical TMS time windows responsible for the interaction effect in the strong support-ratio condition: early and intermediate (see Fig. 2a). We computed the difference between performance scores following stimulation at these two time windows (the TMS effect) per TMS target location (for LO: intermediate – early; for V1/V2: early – intermediate). Next, the TMS effect was correlated with performance on the TMS time window in which no behavioral effect was observed (for LO, the intermediate time window; for V1/V2, the early time window). For the strong support ratio, we observed nonsignificant positive correlations for both the LO condition ($p = 0.49, p = .18$) and the V1/V2 condition ($p = 0.13, p = .73$; see Figs. S1a and S1b in the Supplemental Material available online). For the medium support ratio (Figs. S1c and S1d in the Supplemental Material), this analysis yielded similar positive but nonsignificant correlations for both LO ($p = 0.30, p = .43$) and V1/V2 stimulation ($p = 0.28, p = .46$). These findings indicate that although no interaction effect was found for the medium support ratio, the data still had the same general structure as for the strong support ratio, which makes it likely that reduced perceptual strength decreased the TMS effect for the medium support ratio.

For RTs, there was a main effect of TMS time window, $F(3, 24) = 29.1, p < .001$, but no significant interaction effect, $F(3, 24) = 0.277, p = .841$. TMS had a general increasing effect on RT, but this increase was the same for all three time windows—no TMS: 556 ms, TMS in the early time window: 620 ms, TMS in the intermediate time window: 631 ms, TMS in the late time window: 629 ms. It thus seems that the specific decrease in performance could not be explained by a speed/accuracy trade-off: RTs increased during TMS stimulation no matter which time window was used or what location was stimulated. Because there was no significant interaction between TMS time window and TMS location, we did not further analyze RTs for the three support ratios separately.

**Discussion**

Researchers have reported different findings about the extent to which lower-level versus higher-level visual mechanisms contribute to perceptual completion (Davis & Driver, 1998; Lee & Nguyen, 2001; Lee & Vecera, 2005; M. M. Murray et al., 2002; von der Heydt et al., 1984). In human imaging studies, area LO has been associated most consistently with processing of perceptual completion (M. M. Murray et al., 2002; Ritzl et al., 2003). In previous work, LO has been strongly associated with higher-level computations, such as the representation of objects and object fragments (Grill-Spector, Kourtzi, & Kanwisher, 2001; Konen & Kastner, 2008), which makes this area well fit for integrating local elements involved in perceiving illusory figures (Harris et al., 2011). However, the involvement of early visual cortex has also been observed (Halgren et al., 2003; Lee & Nguyen, 2001; Maertens & Pollmann, 2005), which suggests that different levels in the visual system contribute to perceptual completion. The present study shows that both early visual cortex and higher visual area LO are necessary for perceiving an
Fig. 2. Percentage of correct responses as a function of the occurrence and timing of transcranial magnetic stimulation (TMS) over V1/V2 and lateral occipital (LO) areas. Results are shown separately for stimuli with (a) strong, (b) medium, and (c) weak support ratios. Asterisks indicate significant comparisons (p < .05). Error bars indicate ±1 SEM. The illustration in (a) highlights the feed-forward/feedback loop between V1/V2 and LO that occurs during perceptual completion (e.g., the perception of a Kanizsa square, as shown here).
illusory Kanizsa-type figure. By using TMS, we established a causal relation between activity in both early visual cortex and LO and performance on an illusory-figure-discrimination task.

To find out how higher-level visual areas and early visual cortex are involved in perceptual completion, we briefly disrupted activity in V1/V2 and LO in early, intermediate, and late time windows. When we compared when and where activity was necessary for perceptual completion, we found that the critical time window for early visual cortex followed the critical time window for LO. Disruption of neural signaling in LO at 100 ms after stimulus onset resulted in reduced performance scores on an illusory-figure-discrimination task, and TMS applied over early visual cortex deteriorated performance at a later time (160–182 ms after stimulus onset). These findings seem to argue against a mechanism in which lower and higher visual mechanisms exclusively interact in a hierarchical, feed-forward fashion. The involvement of V1/V2 after the contribution of LO is hard to explain by strict feed-forward processing, in which the contribution of early visual cortex is completed after basic computations have been fed forward to higher visual areas. In contrast, our findings provide evidence for a neural mechanism that incorporates recurrent interactions. These recurrent interactions could, for instance, bring higher-level information from LO back to early visual cortex or carry predictive signals about neural activity to early visual regions (Koivisto et al., 2011; Rao & Ballard, 1999).

In the last decade, the importance of feedback signals from higher to lower visual areas has been increasingly supported by studies using TMS (Juan & Walsh, 2003; Koivisto et al., 2011; Ro et al., 2003). Feedback interactions between medial temporal area and early visual cortex have been shown to be necessary for conscious perception of motion (Pascual-Leone & Walsh, 2001; Silvanto, Cowey, Lavie, & Walsh, 2005). Recently, Koivisto and colleagues (2011) used natural-scene categorization to show the importance of feedback from the ventral stream (LO) to early visual cortex. They showed that V1/V2 has a long critical period that starts before the critical period of LO and ends afterward. However, TMS seemed mainly to disrupt subjective performance and not the accuracy of the categorization, which suggests that mainly the conscious experience of the natural scene was impaired (Crouzet & Cauchoix, 2011).

Our experiment found additional evidence on the disruption of subjective experience by the interruption of feedback to early visual cortex. In contrast with most TMS studies, in which visual processing is more easily disrupted when visual stimulation is weak, our results show a behavioral effect of TMS only when the percept of the illusory square was strong. This latter finding suggests that TMS did not so much disrupt the processing of the physical stimulus characteristics present in the scene (the inducers) but rather seemed to interfere with mechanisms responsible for creating a conscious experience of the illusory figure. This is corroborated by correlational analyses, which hint at a positive relationship between perception of the illusory square and the size of the TMS effect (see Results and Fig. S1). Moreover, the fact that TMS disrupted performance mainly when the support ratio was strong suggests that the effect was specific to the perception of an illusory figure. If participants were performing the task based on the shape of one inducer, we would have expected to find the greatest TMS effects for the medium and small support ratios, because TMS usually disrupts performance most when stimuli become smaller and nearer to threshold (Kammer & Nusseck, 1998).

Although the present findings suggest an important role for feedback processing, past findings show that disrupting feed-forward-driven transient neural responses related to stimulus onset and offset are also capable of interfering with the processing of target stimuli (Macknik & Livingstone, 1998; Supèr, Romeo, & Keil, 2010). However, in the current experiment, illusory figures served as target stimuli and thus no actual onset and offset responses were generated. In the same sense, it is interesting to examine at what level—input or output—TMS modulates activity of a cortical area (Tehovnik, Tolias, Sultan, Slocom, & Logothetis, 2006). It could be that disruption of TMS interferes mainly with processing of incoming signals without leading to noisy output. Unfortunately, our methodological setup does not allow us to make clear predictions about such dynamics.

In this experiment, we based the time windows in which we applied TMS on previous studies showing neural correlates of perceptual completion at these moments in time (Halgren et al., 2003; M. M. Murray et al., 2002). By using earlier time windows, we probably could have found an earlier effect of TMS applied over early visual cortex related to disruption of low-level stimulus characteristics. Previous work (Weigelt, Singer, & Muckli, 2007) has demonstrated that physical features that induce perceptual completion are processed in V1; by contrast, activity in LO is more related to shape segmentation. These findings seem to support a two-stage model for amodal completion (Sekuler & Palmer, 1992). We propose an extension of the two-stage model, in which the emergence of shape and surface detection in LO might subsequently induce the construction of illusory contours by means of feedback signaling to early visual cortex. From such a perspective, it could very much be that after physical features and shapes are detected (in V1 and LO, respectively), feedback signaling to early visual cortex is necessary for the completion of the percept.

In sum, our results contribute to the growing evidence that perceptual completion, the construction of a percept shaped by experience and predictions, and possibly visual awareness are mediated by recurrent interactions between higher visual areas and early visual cortex (Halgren et al., 2003; Koivisto et al., 2011; S. O. Murray, Kersten, Olshausen, Schrater, & Woods, 2002; Pascual-Leone & Walsh, 2001; Supèr & Romeo, 2011).

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**Declaration of Conflicting Interests**

The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

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**Supplemental Material**

Additional supporting information may be found at http://pss.sagepub.com/content/by/supplemental-data

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