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Inhibitory Tagging in Inhibition of Return is Affected in Schizophrenia: Evidence From the Stroop Task

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L. J. Fuentes, A. B. Vivas, and G. W. Humphreys (1999b) showed that stimulus processing is affected when stimuli are presented to locations subject to inhibition of return. They argued that activated representations of stimuli presented at inhibited locations are disconnected from their associated responses through an "inhibitory tagging" mechanism occurring in inhibition of return. In the present research, the authors asked whether such a mechanism is affected in people with schizophrenia. Healthy adults and patients with schizophrenia performed a Stroop task in an inhibition of return paradigm. Healthy adults showed a reduction in the Stroop interference when stimuli were presented at inhibited locations, a result that agrees with the inhibitory tagging mechanism hypothesis and replicates previous findings. However, patients with schizophrenia did not show such a reduction, a result suggesting that they have a deficit in inhibitory processing occurring in inhibition of return.

Visual attention consists of a complex of networks that exert an important role in controlling information processing. One of these networks is related to orienting attention to particular locations in the visual field in anticipation of targets appearing in those locations (Posner, 1980). This orienting function is exerted through the deployment of both facilitatory and inhibitory mechanisms in tasks that require detection of target stimuli. For instance, if the location of a target is presignaled by a cue, responses to targets appearing in that location are speeded, more accurate, or both, than if the target is presented to a noncued location (Bashinski & Bacharach, 1980; Müller & Findlay, 1988; Posner, 1980). However, if the cue is not informative regarding the location of the target, and the interval between the cue and the target is longer than 300 ms, responses are then longer, less accurate, or both, for targets presented in previously cued locations compared with noncued locations (Maylor, 1985; Maylor & Hockey, 1987; Posner & Cohen, 1984). This inhibitory effect is called *inhibition of return* (IOR) and is thought to reflect a bias of the orienting network to not explore already attended locations.

Recent research has shown that IOR is not a unitary phenomenon. IOR has been found with manual and saccadic responses in simple detection tasks (Abrams & Dobkin, 1994), with lexical decisions (Chasteen & Pratt, 1999; Fuentes, Vivas & Humphreys, 1999a, 1999b), color discrimination (Law, Pratt, & Abrams, 1995), Stroop interference (Vivas & Fuentes, 1999), and other kinds of discrimination responses (Lupiáñez, Milán, Tornay, Madrid & Tudela, 1997; Pratt, 1995).

IOR has also been found to act on both location- and object-based frames of reference (Tipper, Driver, & Weaver, 1991; Tipper, Weaver, Jerreat, & Burak, 1994). All this evidence led some authors to conceive of IOR as a multicomponent mechanism of visual attention subserved by different neural systems: One low-level component, involved in location-based IOR, seems to be mediated by midbrain structures such as the superior colliculus, and a higher level component, involved in object-based IOR, seems to be mediated by cortical structures (Tipper et al., 1997, 1994).

Inhibitory Tagging in IOR

In recent studies, Fuentes et al. (1999b) argued for the possibility that multiple components of IOR affect target processing at different levels depending on the task. In their study, they combined procedures that have been found to elicit IOR with tasks that have been shown to tap specific levels of information processing: semantic processing and flanker interference. They found that when stimuli (prime words in the semantic priming procedure and distractors in the flanker procedure) were presented at noninhibited locations, the standard effects (positive semantic priming and incompatible flanker interference, respectively) emerged.

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When those stimuli were presented to locations subject to IOR, positive priming turned into negative priming with the shortest prime-target stimulus onset asynchrony (SOA), and compatible distractors produced longer reaction times (RTs) than incompatible distractors.

Fuentes et al. (1999b) accounted for these striking reversed effects in terms of an "inhibitory tagging" mechanism involved in IOR. Note that inhibitory tagging must be distinguished from IOR per se. IOR is the delay in orienting attention to a previously attended location as the result of a tendency of the organism to explore new locations. Inhibitory tagging is a mechanism that operates in IOR and, we assume, affects target processing when targets are presented at locations subject to IOR. This mechanism would act by temporarily disconnecting the activated representations of stimuli at cued locations from their associated responses. A proof that inhibitory tagging acts by disconnecting activated representations of stimuli rather that suppressing them is provided by Fuentes et al.'s (1999b) semantic priming results. Primes at cued locations, subject to IOR, produced negative priming (longer RTs in the related condition than in the unrelated condition) when they were shortly followed by targets. However, after longer intervals, the negative effect became positive. This pattern of results demonstrates that representations of prime stimuli (and those of their associates) at cued locations were activated during that short time but disconnected with their associated responses, producing negative priming effects. Once the temporal inhibitory tagging process was completed, the activated representations of those stimuli produced the standard positive priming.

The inhibitory tagging mechanism can provide a general account of IOR in a variety of tasks ranging from detection of peripheral targets, mediated by the eye movement system (Rafal, Calabresi, Brennan, & Sciolto, 1989), to more complex tasks, such as lexical decisions (Fuentes et al., 1999a, 1999b), flanker interference (Fuentes et al., 1999b), or color discrimination in the Stroop task (Vivas & Fuentes, 1999), which might be mediated by cortical areas.

Stroop Interference in IOR

To our knowledge, Stroop interference and IOR have been explored in only one study in which the researchers used a single experiment (Vivas & Fuentes, 1999). Vivas and Fuentes presented the Stroop stimuli in locations subject to IOR (cued locations) or in noninhibited (uncued) locations. The Stroop interference was reduced when stimuli fell at cued locations. This reduction was mainly due to the fact that congruent and neutral targets showed an increase in RTs when presented at cued compared with uncued locations (IOR effects). However, incongruent targets did not show such an increase; that is, IOR was not observed in this condition. This pattern of results is compatible with the idea of an inhibitory tagging mechanism that inhibits the prepotent tendency to read the word in the Stroop task when stimuli fall at cued locations.

Inhibition of Return in Schizophrenia

Few researchers have explored IOR in patients with schizophrenia. Huey and Wexler (1994) found delayed onset and blunted magnitude of IOR in a group of medicated outpatients. Fuentes and Santiago (1999), however, found normal IOR in medicated patients compared with healthy adults. Although the authors of the two studies used a target detection task, there is an important difference in their procedures. Huey and Wexler used a single-cue paradigm, whereas Fuentes and Santiago used a double-cue paradigm. In the double-cue paradigm, a central cue intervenes between the peripheral cue and the target. This procedure helps the participant to reorient attention to the middle after the offset of the peripheral cue. Healthy adults do not need the presence of the second cue to elicit IOR, but some neurological patients do (e.g., see Faust & Balota, 1997, for a description of a deficit of IOR in Alzheimer's patients with the single-cue but not with the double-cue procedure). Thus, it is possible that patients with schizophrenia have a deficit in disengaging attention from the peripheral cue and then reorienting it to the middle without the help of the second cue, which would locate the deficit not in the IOR process itself, but instead in the processes that lead to IOR. These processes might be mediated by cortical areas (see Fuentes & Santiago, 1999). In a recent study, we assessed IOR in healthy adults and medicated adults with schizophrenia using both cuing procedures (Fuentes, Boucart, Alvarez, Vivas, & Zimmerman, 1999). The results showed that both healthy adults and medicated patients with schizophrenia exhibited comparable IOR effects in both cuing conditions. We also conducted the experiment with a nonmedicated patient who, however, failed to show IOR when a single cue was used. This result suggests that medication might play a relevant role in resolving some deficits in disengaging attention from the cue and then endogenously reorienting it to the middle before the target is presented. A further study in which the researchers test a group of nonmedicated patients with schizophrenia could corroborate these preliminary results shown by the aforementioned single-case study.

This scarce evidence of IOR functioning in people with schizophrenia gets worse when one notes the lack of studies in which investigators have examined IOR effects in more complex tasks, which might involve cortical functioning. Schizophrenia has been associated with deficits in inhibitory processing that depends on attentional networks located in anterior structures of the cortex (DiGirolamo & Posner, 1996; Fuentes & Santiago, 1999). Thus, it is possible that inhibitory mechanisms involved in high-level components of IOR, such as the inhibitory tagging mechanism described above, might be impaired in patients with schizophrenia.

Stroop Interference in Schizophrenia

In contrast to IOR, the Stroop task has been amply used as a selective attention measure to assess the attentional deficits associated with schizophrenia. Researchers have reported different patterns of performance in healthy adults versus

those with schizophrenia, depending on the version of the Stroop task they used (for critical evaluations of these differences, see Boucart, Mobarek, Cuervo, & Danion, 1999; Perlstein, Carter, Barch, & Baird, 1998). Some researchers used the card version of the task (Golden, 1978) in which the number of items reported within a determined time limit (e.g., Buchanan et al., 1994; Wysocki & Sweet, 1985) or the time required to complete each card (e.g., Abramczyk, Jordan, & Hegel, 1983; Cantor-Graae, Warkentin, & Nilsson, 1995; Verdoux, Magnin, & Bourgeois, 1995; Wapner & Krus, 1960) was taken as the measure of Stroop performance. These authors have usually reported increased interference (incongruent condition vs. neutral condition) in patients with schizophrenia compared with healthy controls.

Other researchers used a single-trial version of the Stroop task in which individual stimuli are presented on the screen of a computer, and RT and accuracy data are registered for each trial. In contrast to the card version, these authors have reported increased RT facilitation (congruent condition vs. neutral condition), rather than interference, in patients with schizophrenia compared with healthy individuals (Carter, Robertson, Nordahl, O'Shora-Celaya, & Chaderjian, 1993; Cohen, Barch, Carter, & Servan-Schreiber, 1999; Perlstein et al., 1998; Taylor, Kornblum, & Tandon, 1996; but see Boucart et al., 1999, for their description of a failure to find disproportional facilitation or interference in schizophrenic patients).

This discrepancy in the abnormal pattern of Stroop performance in patients with schizophrenia between the two versions of the Stroop task may be due to important methodological differences between them (blocked vs. mixed randomized presentation of the three conditions; presence of distractors vs. no distractors in the spatial environment of the target in the card and single-trial versions, respectively; Boucart et al., 1999) or to the supposedly inappropriate methods for inferring interference scores in most of the aforementioned studies (Perlstein et al., 1998).

In any case, the relevant conclusion for the purpose of the present research is that patients with schizophrenia do not seem to exhibit disproportional Stroop interference effects when a single-trial version of the Stroop task, such as that of the present study, is used.

The Present Study

In this research, we aimed to assess the inhibitory tagging process involved in IOR when both healthy adults and people with schizophrenia perform a Stroop task. The Stroop task was used because some authors have suggested that the interference effect produced by color-incongruent stimuli reflects the operation of high-level attention, which is required whenever habitual responses, such as reading, must be suppressed to permit unusual responses, such as naming colors, to be performed (for a review, see Posner & DiGirolamo, 1998). In addition, the Stroop effect is associated with activation in different areas, such as the cingulate cortex (Beech et al., 1993; George et al., 1994; Pardo, Pardo, Janer, & Raichle, 1990) or the prefrontal cortex (e.g., the left inferior frontal gyrus; Taylor, Kornblum, Lauber, Minoshima, & Koeppe, 1997), that are thought to reflect the operation of executive attention (Posner & Raichle, 1994). Thus, any interaction between the Stroop task mediated by executive attention and the IOR task mediated by the orientation network of attention would support the idea of interactive networks of a common attentional system (Fuentes, Langley, Overmier, Bastin de Jong, & Prod'Homme, 1998; Fuentes et al., 1999a; Posner, 1988; Posner, Inhoff, Friedrich, & Cohen, 1987; Posner & Raichle, 1994).

In the present experiment, we reproduced the procedure used by Vivas and Fuentes (1999) by presenting the Stroop stimuli at either cued or uncued locations. We made the following predictions. If schizophrenia is associated with a deficit in generating IOR per se when a discrimination response is required by the task, we should find a deficit in the IOR effect in this experiment. If schizophrenia is associated with a deficit in high-level attention involved in the Stroop task, patients with schizophrenia should exhibit higher levels of Stroop interference compared with healthy adults. However, according to previous research and given that the present study uses a single-trial version of the task, we did not expect increased interference in the group with schizophrenia. Finally, if schizophrenia is associated with a deficit in the inhibitory tagging mechanism involved in IOR, we should not find any difference in the Stroop effect whether the stimuli are presented at the uncued location or at the cued location. Note that a reduction in the Stroop effect when the stimuli are presented at the cued location is what should be expected for healthy adults, given the results of Vivas and Fuentes' study. Therefore, the lack of such a reduction would be associated with a deficit in the inhibitory tagging mechanism.

Method

Participants

Healthy adults ($n = 13$) and patients diagnosed with schizophrenia ($n = 13$) participated in this experiment. Healthy adults were recruited from the staff of the Hôpital Civil de Strasbourg. They ranged in age from 23 to 48 years, with a median of 26 years. Participants with schizophrenia were medicated outpatients ranging in age from 20 to 55 with a median of 36 years; they signed a consent form and were paid for their participation. Overall, participants with schizophrenia had fewer years of education than healthy adults. All the participants had normal or corrected-to-normal vision and were naive about the purpose of the experiment.

Materials and Apparatus

Stimuli were presented on the 14-in. (35.56-cm) color screen (VGA) of an IBM-compatible computer, and participants recorded their responses using the computer keyboard. The targets were the words *rouge* (red), *bleu* (blue), and *vert* (green) and a string of *X*s displayed in red, blue, or green color. The color words served as stimuli in the incongruent condition (e.g., the word *red* displayed in blue color), and the string of *X*s were used in the neutral condition. The congruent condition (e.g., the word *red* displayed in red color) was not used in this experiment.

Procedure

Figure 1 shows the stimuli and length of exposure used in the experiment. Participants sat approximately 60 cm from the com-

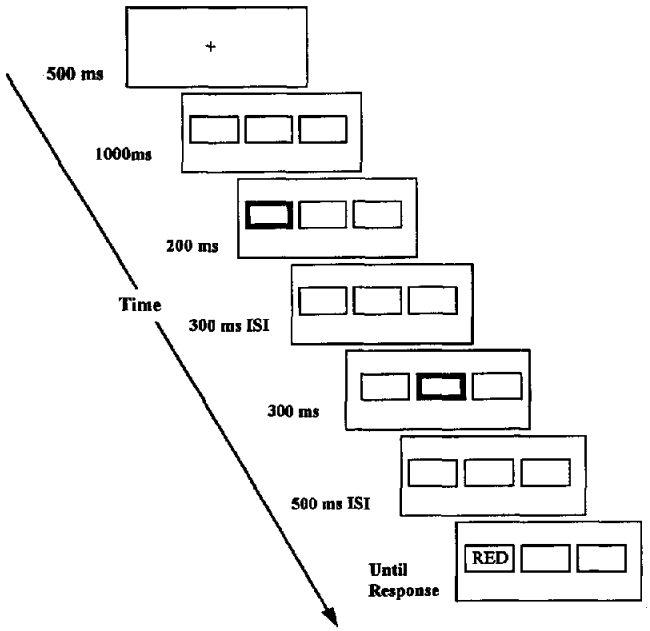

Figure 1. Sequence of events and length of exposure of stimuli in the experiment. Only the incongruent and neutral conditions were included. ISI = interstimulus interval.

puter, and the experimenter verbally explained the task to them. Each trial began with a fixation point (a plus sign) presented in the middle of the screen until the participant initiated the trial. Three white boxes then replaced the fixation point and were presented for 1,000 ms. Then, one of the peripheral boxes became thicker for 200 ms. This action served as a cue to attract attention to the periphery. After the peripheral cue was off, the boxes were then presented for 300 ms, followed by a thicker central box (the second cue) for 300 ms. The boxes were then all presented again for 500 ms. The target was subsequently presented an equal number of times either at the cued location or at the uncued location. The target was a color word or a string of *X*s displayed in red, blue, or green for the incongruent and the neutral conditions, respectively. In half of the trials, the target was a color word, and it was a string of *X*s in the other half of trials. Each color word was displayed in the remaining colors an equal number of times, and the string of *X*s was displayed in red, blue, and green the same number of times. Three keys from the computer keyboard were covered by color patches, and the participants were told to press the key corresponding to the color of the target.

All participants ran one practice block of 48 trials and two experimental blocks of 96 trials each. Each experimental block consisted of 12 trials for each experimental condition, resulting in a 2 (Stroop condition: incongruent, neutral) × 2 (target location: cued, uncued) × 2 (visual field: left, right) block. The same proportion of trials per condition was used for the practice block.

Results

The RTs above 2,500 ms or below 250 ms were discarded from the data analyses. Less than 1% of the trials were discarded following that criterion. Table 1 shows the mean RTs and percentage of errors. Correct RTs were submitted to a 2 × 2 × 2 × 2 mixed analysis of variance (ANOVA) with group (schizophrenic adults vs. healthy adults) as the between-subjects factor and congruence (incongruent vs. neutral), location (cued vs. uncued), and visual field (left vs. right) as the within-subjects factors. The main effects of group, congruence, and location were significant, $F(1, 24) = 32.5$, $p < .001$, $F(1, 24) = 14.1$, $p = .001$, and $F(1, 24) = 6.2$, $p < .05$, respectively. Patients with schizophrenia were slower than healthy adults (1,235 ms vs. 682 ms), the incongruent condition produced longer RTs than the neutral condition (977 ms vs. 940 ms), and the cued location produced slower RTs than the uncued location (969 ms vs. 948 ms). That is, we observed Stroop interference and IOR effects. However, these effects were modulated by the significant Group × Congruence × Location interaction, $F(1, 24) = 9.5$, $p < .01$. That is, for the participants with schizophrenia, the Congruence × Location interaction was not significant, $F = 1$; Stroop interference was of similar magnitude for targets at cued (51 ms) and uncued (40 ms) locations, $F(1, 12) = 11.6$, $p < .01$, and $F(1, 12) = 4.8$, $p < .05$, respectively. However, for healthy adults, the Congruence × Location interaction was significant, $F(1, 12) = 11.8$, $p < .01$. Stroop interference was significant only for targets at the uncued location (45 ms) but not at the cued location (14 ms), $F(1, 12) = 9.99$, $p < .01$, and $F(1, 12) = 1.5$, $p > .24$, respectively.

The error analysis showed that only the four-way Group × Congruence × Location × Visual Field interaction

Table 1
Mean Reaction Times (in Milliseconds) and Percentage of Errors as a Function of Congruency, Location, and Visual Field for Healthy and Schizophrenic Adults

Visual field and group	Incongruent				Neutral			
	Cued		Uncued		Cued		Uncued	
	M	% error	*M*	% error	*M*	% error	*M*	% error
LVF								
Healthy adults	703	3.2	696	3.2	694	2.7	657	1.6
Schizophrenic adults	1,251	3.5	1,239	4.2	1,214	5.0	1,190	1.3
RVF								
Healthy adults	692	2.9	697	3.5	673	3.8	647	1.3
Schizophrenic adults	1,294	5.4	1,245	3.8	1,230	2.6	1,213	2.9

Note. LVF = left visual field; RVF = right visual field.

was significant, $F(1, 24) = 5.2$, $p < .05$. This interaction emerged because for healthy adults, the incongruent condition produced less errors than the neutral condition when targets were presented at the cued location in the right visual field, whereas for the schizophrenic patients, that result was observed in the left visual field. As the remaining six comparisons showed more errors in the incongruent than in the neutral condition (Stroop effect), we did not analyze the error data any further.

Discussion

The present study showed that healthy adults and medicated patients with schizophrenia exhibit IOR effects in a color discrimination task such as the Stroop task. Also, the group with schizophrenia showed equivalent interference effects compared with the healthy adult group, at least in the condition that was not subject to any kind of inhibition (i.e., the uncued location; see Figure 2). These results suggest that mechanisms involved in producing IOR per se and Stroop interference in the single-trial version are preserved in medicated patients with schizophrenia, a finding that is in accord with previous studies.

However, in contrast to healthy adults, participants with schizophrenia did not show any reduction in the Stroop effect when stimuli were presented at locations subject to IOR (cued location). These results suggest that (a) any mechanism involved in IOR interferes with the processes that lead to interference effects in the Stroop task and (b) such a mechanism is affected in people with schizophrenia.

Inhibitory Tagging in the Stroop Task

The results with healthy adults replicate the pattern of Stroop interference found by Vivas and Fuentes (1999). In the present experiment, we did not simply observe a reduction in the Stroop effect when stimuli fell at inhibited locations; rather, the effect vanished completely. This between-studies difference may be due to the fact that in contrast to Vivas and Fuentes' study, in the present experiment we did not include congruent trials. MacLeod and McDonald (1995) found evidence that congruent trials may encourage participants to read the word. Although this action is difficult to detect because reading the word does not lead to errors, if true it may unconsciously bias the participants to do it throughout the experiment, making it harder to ignore the word on incongruent trials as well. Evidence for this idea is the greater magnitude of Stroop interference when congruent trials were included in Vivas and Fuentes' study compared with the present study in which congruent trials were not included (87 ms vs. 37 ms on average, respectively). Besner, Stolz, and Boutilier (1997) found a pattern of Stroop interference similar to ours. Participants named the color of Stroop stimuli when either all letters were colored or only one letter was colored. When congruent trials were included (Experiment 1), they observed a reduction in the Stroop effect in the single-letter condition compared with the all-letters condition. When congruent trials were excluded (Experiment 2), the Stroop effect was eliminated completely.

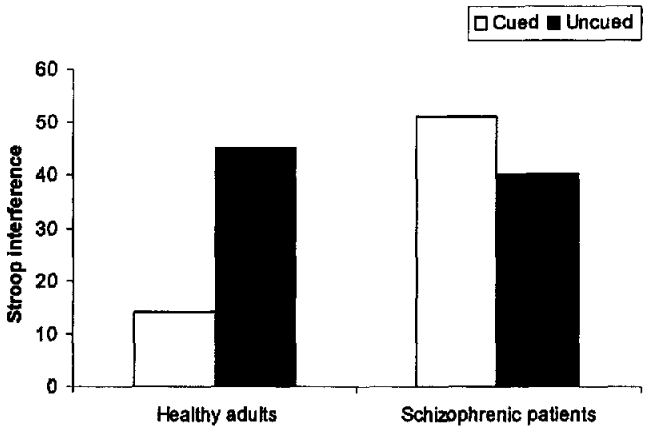

Figure 2. Stroop effects for healthy adults and participants with schizophrenia for targets at cued and uncued locations.

Thus, what level of processing in the Stroop task is affected by IOR? One possibility is that IOR affects the efficiency with which stimulus information is perceptually analyzed. However, there are two arguments that conflict with such a proposal. The first one comes from the Fuentes et al. (1999b) study. As we mentioned earlier, Fuentes et al. (1999b) showed that prime words presented at locations subject to IOR still produce semantic priming effects. The second argument comes from the present results (see also Vivas & Fuentes, 1999). If stimuli presented at inhibited locations are perceived less efficiently, we would have seen longer RTs with incongruent trials when the stimuli appeared at cued locations compared with when they appeared at uncued (noninhibited) locations; that is, IOR would have been observed with incongruent trials as well. That was not the case; the IOR effect was observed only in the neutral condition. However, this last result leads to the possibility that the present pattern of results can be accounted for without any reference to any mechanism involved in IOR. One might argue that resolving the conflict produced by the word meaning in the Stroop task prevents the manifestation of IOR. This idea can explain why standard IOR is observed with neutral stimuli in which conflict does not occur but not with incongruent stimuli characterized by conflict between the color and the word.

However, it is difficult to assume that an effect such as IOR that usually manifests with the mere onset of a stimulus is eliminated by later-acting processes that are involved in resolving the conflict produced by the word. In contrast, Fuentes et al. (1999a) found that the magnitude of IOR was larger when the task required more complex target processing (as in lexical decisions) than merely detecting the target onset. In line with this hypothesis, we should expect larger IOR with incongruent trials than with neutral trials because the former would involve more complex processing than the latter.

On the contrary, we assume that the elimination of IOR in the incongruent condition is the indirect consequence of

responses being facilitated by the effect of a mechanism that prevents the irrelevant dimension of the target from being competitive for response. We call this mechanism *inhibitory tagging*.

A second argument against the account of the Stroop interference effect on IOR comes from the patients' data. If that account were true, IOR would not have been observed with incongruent stimuli in the group with schizophrenia either because, at least in this study, these participants exhibited equivalent Stroop interference effects compared with healthy adults (at least at the noninhibited location; see Figure 2). In this study, we used a Stroop task version that avoids potential disadvantages for the group with schizophrenia to solve the conflict produced by the word (e.g., item-by-item presentation, no congruent trials). Then, any differential pattern of results of this group compared with healthy adults should reflect a deficit in mechanisms other than those responsible for either IOR or Stroop interference effects. We think this mechanism is inhibitory tagging occurring in IOR.

Taken together, the present results and data from previous inhibitory tagging studies suggest that this mechanism acts by disconnecting activated representations of stimuli presented at previously attended locations from their associated responses. Also, the present results suggest that the inhibitory tagging mechanism affects the irrelevant dimension of Stroop stimuli, avoiding the intrusive effects of the prepotent tendency to read the word that competes with responding to the stimulus color. This hypothesis is in accord with Vivas and Fuentes' (1999) contention that the inhibitory tagging mechanism is applied also to irrelevant but prepotent dimensions of stimuli falling at inhibited locations, such as the word meaning in the Stroop task.

Finally, the interaction observed between the Stroop effect and the IOR effect suggests that both tasks share a common mechanism. This idea supports our previous contention that different forms of attention can be thought of as attentional networks of a common attentional system (Fuentes et al., 1998, 1999a; see also Posner & Raichle, 1994, for a review).

Inhibitory Tagging in Schizophrenia

Similar to healthy adults, patients with schizophrenia showed IOR effects. This result extends the observation of preserved IOR in simple detection tasks (Fuentes et al., 1999a; Fuentes & Santiago, 1999) to situations in which more complex responses, such as color discrimination, are demanded by the task.

Participants with schizophrenia also showed Stroop effects. When compared with that of healthy adults, the magnitude of the Stroop interference at noninhibited locations was fairly similar despite the fact that, overall, RTs were longer in the group with schizophrenia than in the healthy adult group (see Table 1). These results replicate those reported by Boucart et al. (1999), who found that patients with schizophrenia displayed an overall increase in RTs, but the magnitude of the Stroop effect was equivalent for patients and controls. A disproportionate increase in the conflict condition for patients with schizophrenia has been reported in several studies in which researchers used the card version of the Stroop task (as was mentioned earlier) but not with the single-trial version. With this version, Boucart et al. demonstrated that disproportionate Stroop interference occurs only when the target word is surrounded by distractors, suggesting that patients with schizophrenia have difficulties in inhibiting the processing of distractors.

Despite the fact that patients with schizophrenia showed both IOR and Stroop interference effects similar to those of healthy adults, they did not show a reduction in the Stroop effect when targets were presented at inhibited locations. This finding reflects a deficit in the inhibitory tagging mechanism we have proposed to explain such a reduction in healthy adults (Vivas & Fuentes, 1999). The implications of such a deficit for understanding the inhibitory processing deficits associated with schizophrenia are difficult to determine because there are still so few researchers who have studied the nature and functioning of inhibitory tagging in IOR. Earlier, we suggested that this mechanism may depend on cortical areas that have been thought to be impaired in people with schizophrenia; however, this claim is only tentative. In any case, the results of the present study reveal that schizophrenia is not associated with deficits in IOR itself but instead in inhibitory processing occurring in IOR.

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