



Imagining as an Observer: Manipulating Visual Perspective in Obsessional Imagery

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Abstract

Mental images may be experienced in field (first-person) or observer (third-person) perspective. Compared to field, observer perspective has been shown to be less sensorially and emotionally evocative. Previous research suggested that images in obsessive–compulsive disorder (OCD) are predominately experienced in field perspective. We examined the impact of visual perspective on response to intrusive obsessional images, using autobiographical memory images as a control stimulus. Undergraduates ($N = 153$) imagined idiosyncratic obsessional scenarios and negative memories from their natural visual perspective, then re-imagined them from a field or observer perspective. At baseline, field perspective was positively associated with vividness and distress and OCD symptoms were associated with an observer perspective. Participants shifted to observer perspective reported reduced vividness of the obsessional image, whereas those shifted to field reported increased anxiety associated with the obsessional image. Memories showed a similar, but not identical, pattern of results. We discuss implications for imagery in OCD.

Keywords Obsessive–compulsive disorder · Visual perspective · Intrusive imagery

Mental imagery is a common feature of many psychological disorders (Brewin et al. 2010; Krans et al. 2010), and, together with intrusive thoughts and impulses, forms part of the diagnostic criteria for obsessive–compulsive disorder (OCD). Mental images can be defined as “contents of consciousness that possess sensory qualities” (Hackmann 1998, p. 301) and are consequently distinct from cognitions, in that they are not purely verbal or abstract (Klein and Moritz 2014). Accordingly, individuals can “see with the mind’s eye” or “hear with the mind’s ear.” Mental images in psychopathology are often described as intrusive, such that they appear involuntarily in consciousness and interrupt ongoing mentation (Brewin et al. 2010; Rachman 2007).

Brewin et al. (2010) proposed the revised dual representation theory of visual intrusions to elucidate the development of pathological intrusive images. According to this theory, two different types of memory representations are encoded

during an event. Sensation-based representations (S-reps) underpin memory for sensory details and affective states experienced during an event, whereas contextual representations (C-reps) are abstract, meaning-based event descriptions embedded with spatial and temporal input (Brewin and Burgess 2014; Brewin et al. 2010).

In healthy memory, S-reps and C-reps are tightly associated (Brewin and Burgess 2014; Brewin et al. 2010). However, during high stress, pathological encoding involves preferential processing of sensory and perceptual material and a relative lack of conceptual processing (Krans et al. 2010). The experience of a traumatic or emotionally salient event can therefore result in the creation of more enduring S-reps, weaker C-reps, and diminished connections between the two (Brewin et al. 2010). Consequently, S-reps can be involuntarily activated by environmental and/or internal cues associated with the original emotional disturbance without the concurrent retrieval of appropriate conceptual information. Thus, intrusive images in psychopathology may represent enduring sensory-bound representations that have been poorly integrated with contextualizing knowledge.

Consistent with this theoretical framework, research suggests that intrusive mental images are vivid and distressing, and it is common for their occurrence to elicit

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strong somatic sensations and emotions (Brewin et al. 2010; Rachman 2007). Furthermore, mental imagery has been found to evoke both stronger affective responses and greater sensory involvement than verbal processing of equivalent material (Holmes et al. 2006, 2008, 2009; Holmes and Mathews 2005; Nelis et al. 2012). The preferential relationship between mental imagery and emotion may explain the salience of intrusive imagery in psychopathological conditions such as obsessive–compulsive disorder (OCD).

A core feature of OCD, obsessions are defined as intrusive thoughts, urges, or images that are recurrent and unwanted (American Psychiatric Association 2013). They possess sensory qualities, primarily in the visual modality, are brief in duration, and display remarkable stability and consistency (Coughtrey et al. 2013, 2015; De Silva 1986; Lipton et al. 2010; Rachman 2007; Speckens et al. 2007). Intrusive obsessional images tend to depict ego-dystonic themes, which elicit feelings of anxiety, threat, sadness, anger, guilt, and shame (Lipton et al. 2010). They are further marked by their sensory vividness (De Silva 1986; Lipinski and Pope 1994; Rachman 2007). Thus, an individual with doubting/harm obsessions might have the distressing intrusive thought, “I am going to stab my husband” or may instead experience an intense, vivid image in her mind’s eye of plunging the knife into her husband’s neck.

In response to obsessions, individuals with OCD typically engage in repetitive mental or behavioral acts (compulsions) to temporarily reduce the distress provoked by obsessions or to prevent the occurrence of the dreaded event (Coughtrey et al. 2015; Lipinski and Pope 1994; Speckens et al. 2007). In the scenario previously described, the woman may respond to the stabbing image by repeatedly checking the knife drawer to neutralize the obsessional thought.

Systematic investigations of imagery in OCD have provided valuable insight into the prevalence and phenomenology of intrusive obsessional images. Intrusive imagery has been shown to occur in 67–95% of individuals with OCD, with such images described as primarily visual (Coughtrey et al. 2015; Lipton et al. 2010; Speckens et al. 2007). The extant literature also indicates that intrusive imagery occurs frequently in OCD, with one study finding that individuals with OCD were more likely than anxious controls to report experiencing an intrusive image more than five times per week (Lipton et al. 2010). Intrusive obsessional imagery is not only prevalent and frequent, but also characteristically aversive in nature, with clinical observations revealing themes of death and decay, illness and injury, violence and disaster, and sex and blasphemy (De Silva 1986; Lipinski and Pope 1994; Lipton 2008; Rachman 2007). Systematically substantiating these clinical reports, Lipton et al. (2010) described obsessional images characterized by “unacceptable ideas of harm”.

Converging evidence indicates that visual perspective may play a role in determining the phenomenology, and hence, the psychopathological nature, of intrusive images. Mental images can be experienced as though through one’s own eyes, in a field perspective, or from an external point of view, in an observer perspective (Nigro and Neisser 1983). Numerous researchers have investigated the phenomenological distinctions between memories naturally recalled from a field or an observer perspective. Several studies have shown that emotional autobiographical events naturally recalled from a field perspective are more vivid and imbued with greater levels of affective intensity and sensory detail compared to memories naturally recalled from an observer perspective (Berntsen and Rubin 2006; Sutin and Robins 2010; Terry and Horton 2007). Comparable phenomenological distinctions have been observed in studies in which visual perspective was experimentally manipulated. For example, following a shift from a field to an observer perspective, participants tend to report reduced memory-related emotional and sensory reliving (Berntsen and Rubin 2006; Robinson and Swanson 1993; Vella and Moulds 2014).

Several investigations have found that imagery in post-traumatic stress disorder (PTSD) and depression tends to be experienced in an observer perspective, which has been suggested to serve as an avoidance function for the intense emotions associated with the imagery (Kenny and Bryant 2007; Kuyken and Moulds 2009; Williams and Moulds 2007). In contrast to PTSD and depression, preliminary research has suggested that intrusive images in OCD may be predominantly experienced in a field perspective. For example, Coughtrey et al. (2013) and Lipton et al. (2010) demonstrated that individuals with OCD were more likely than healthy undergraduates and anxious controls, respectively, to report experiencing intrusive imagery from a field perspective. However, Coughtrey et al. (2013) specifically examined contamination images and Lipton et al. (2010) had very modest samples of both OCD participants ($n = 17$) and anxiety disorder controls ($n = 9$). Likewise, Coughtrey et al. (2015) and Speckens et al. (2007) found that intrusive obsessional images reported by clinical OCD participants were more often experienced in a field than an observer perspective. Neither of these studies, however, included a comparison group of healthy individuals or individuals with other psychological disorders. Since most memories are retrieved in field perspective (Nigro and Neisser 1983), the absence of a comparison group limits the conclusions that may be drawn regarding OCD and visual perspective.

Beyond naturalistic associations between visual perspective and imagery experience, experimental work has indicated that manipulating visual perspective may influence the phenomenology of intrusive images. In a sample of dysphoric students, Williams and Moulds (2008) found that participants who were shifted from a natural field to

an observer perspective during recall of negative intrusive memories reported decreased memory-related distress and vividness. Similarly, McIsaac and Eich (2004) found that intrusive observer images in individuals with PTSD contained less affective and sensory detail, and were also rated as less emotional and anxiety provoking, compared to field trauma images. Hence, the external vantage point afforded by an observer perspective may limit access to, and thereby protect against, negative affective and sensory experience.

Overview of Current Study

Despite the empirical and clinical relevance of the relationship between visual perspective and intrusive imagery in OCD, to the best of our knowledge no study to date has experimentally investigated this relationship. Given the wealth of evidence suggesting that visual perspective plays a fundamental role in determining the phenomenology of mental images, as well as the preliminary findings that intrusive images in OCD are predominately experienced in a field perspective, we investigated the impact of visual perspective on imagery phenomenology in the context of OCD. We induced naturally-occurring intrusive obsessional images and examined the relationship between visual perspective and the phenomenology of these images. We interviewed undergraduate students using a consensus-created, validated structured interview (Research Consortium on Intrusive Fear [RCIF] 2007) to elicit idiosyncratic OCD-images that intruded in participant's everyday lives. To address the possibility that unreliable measurements contributed to null effects, validated multi-item measures were included when possible.

In order to evaluate whether the impact of instructed visual perspective was specific to obsessional images, we also asked participants to retrieve images representing specific, mildly distressing autobiographical memories (e.g., a time they committed an immoral act) and implemented an identical visual perspective manipulation. We were thus able to contrast the emotional and phenomenological effects of manipulating visual perspective for an intrusive obsessional image with the effects of manipulating visual perspective for an autobiographical memory image.

The primary aim of the current study was to investigate whether visual perspective influences the phenomenology of obsessional imagery. Our first hypothesis was that greater naturally adopted field perspective during obsessional and autobiographical imagery would be associated with heightened imagery phenomenology (i.e., anxiety and vividness) for intrusions and memories. Our second hypothesis was that higher OC symptomatology would be associated with greater natural adoption of a field perspective during imagination of an obsessional scenario but not during imagination

of a memory. Our third hypothesis was that an instructed field visual perspective during obsessional imagery would be associated with increased anxiety and vividness for both obsessional images and memories. Finally, our fourth hypothesis was that an instructed observer perspective would be associated with decreased anxiety and vividness for both obsessional images and memories.

Method

Participants

First-year psychology students participated in the experiment in exchange for course credit ($N = 153$). The study included individuals at all levels of obsessive-compulsive symptoms, but deliberately over-recruited from the top-third of OCI-R (Foa et al. 2002) using scores from a prescreen battery administered to the cohort. This resulted in a sample OCI-R mean of 26.48 ($SD = 10.56$), which is comparable to the mean OCI-R score reported in a clinical OCD sample (26.3; Huppert et al. 2007). Moreover, a large proportion of the sample (77%) had OCI-R scores above the clinical cut-off score of 21 proposed by Foa et al. (2002), suggesting that the higher range of symptoms was well represented. Participants were excluded due to distress during the experiment ($n = 5$), poor English ($n = 3$), or computer failure ($n = 2$), resulting in a final sample of $N = 143$. This final sample ranged in age from 18 to 28 years ($M = 19.4$, $SD = 1.8$) and 57.3% identified as female. With regards to ethnicity, 51% of participants identified as Asian, 42% as European descent, 0.7% were of Aboriginal origin, and 6.3% identified as "other".

Measures

Memory Experiences Questionnaire (MEQ; Sutin and Robins 2007)

The MEQ assessed visual characteristics of intrusions and memories. References to "memory" were replaced with "intrusion" as appropriate. Visual perspective was assessed using six items (e.g., "I see the perspective in the intrusion through my own eyes") answered on a five-point Likert Scale (1 = *Strongly disagree* to 5 = *Strongly agree*). Third-person items were reverse scored and averaged with first-person items to produce a dimensional scale of visual perspective with low scores indicating predominant third-person and high scores indicating predominant first-person (range 1–5). This subscale had good internal consistency at baseline (Cronbach's $\alpha = .90$). The six item Vividness subscale measured image clarity and detail (e.g., "My memory for this event is very vivid"), with higher average scores indicating

more vivid memories/intrusions (range 1–5). The vividness subscale was internally consistent (Cronbach's $\alpha = .79$).

State-Trait Anxiety Inventory (STAI; Spielberger et al. 1983)

State anxiety generated by each intrusion was assessed using a six item short form (Marteau and Bekker 1992) of the STAI. Participants rated how calm, tense, upset, relaxed, content, and worried they felt while visualizing intrusions/memories on a four-point scale (1 = *not at all* to 4 = *very much*). Calm, relaxed, and content were reverse scored, averaged with the remaining items, and multiplied by 20 to produce an internally consistent scale (Cronbach's $\alpha = .82$, range 20–80).

Obsessive–Compulsive Inventory-Revised (OCI-R; Foa et al. 2002)

The OCI-R is a comprehensive self-report measure for assessing symptoms of OCD. The revised version of the questionnaire includes 18 items grouped into six subscales, including washing, checking, ordering, obsessing, hoarding, and neutralizing. Cronbach's alpha in the current sample was .89, indicating good internal consistency.

Depression Anxiety Stress Scales-21 (DASS-21; Lovibond and Lovibond 1995)

The DASS-21 was employed to measure depression, anxiety, and stress symptoms. Participants rated 21 items indexing the extent to which they had experienced each symptom over the preceding week on a 4-point severity scale, ranging from 0 (*did not apply to me at all*) to 3 (*applied to me very much, or most of the time*). The questionnaire demonstrated excellent internal consistency in the current sample, with an alpha coefficient of 0.92.

Procedure

Participants completed the study individually in a laboratory guided by an experimenter. After completing informed consent, the DASS-21, and providing demographic information, participants completed a guided imagination task where they were asked to imagine themselves relaxing at a beach (Day et al. 2004). To explain the concept of visual perspective, participants received an explanation modified from Williams and Moulds (2008).

Sometimes we “see” a mental picture from a first-person perspective. In a first-person picture you see the event as though you are looking out at your surroundings through your own eyes. However, at other times we “see” a mental picture from a third-

person perspective. In a third-person picture you see the event from an observer's point-of-view; in other words, in your imagination you may actually see yourself as well as your surroundings. It may feel as though you are seeing through the eyes of another person, or through a camera hovering in the air. Sometimes it can even feel like we see the scene in both ways. Or, somehow, it seems that neither fits.

Accompanying color photographs depicted a first- and third-person view. Participants indicated whether they visualized their beach scene in either, neither, or both views.

Next, intrusive mental imagery experienced in the last 3 months was elicited using the structured International Intrusive Thoughts Interview Schedule (IITIS; RCIF 2007), which was constructed specifically to detect intrusions in non-clinical samples (Radomsky et al. 2014). The IITIS begins by defining intrusions and provides psychoeducation about their ubiquity (Radomsky et al. 2014). Places where the IITIS referred to “intrusive thoughts, images, urges, or feelings” were amended to “intrusive pictures in your mind”. Each section introduces a thematic domain, provides examples, and assesses for intrusions, including contamination, harm/injury/aggression, doubt, religious/immoral, sexual, victimization, and other intrusions. The experimenter asked follow-up questions to exclude other psychological experiences, such as worry. After intrusions were elicited, participants ranked pictures based on the anxiety provoked when they intruded in everyday life. Finally, participants completed ratings of visual perspective, vividness, and anxiety while visualizing each image, starting with the most anxiety-provoking intrusion, and continuing for 10 min or until they had rated all intrusions. Question order within and between subscales was randomized.

Next, autobiographical memories of recent immoral acts were elicited in an ad hoc structured interview developed from seven domains naturalistically identified in Hofmann et al. (2014). The experimenter explained that moral breaches are everyday occurrences, and asked participants in turn:

“In the past 3 months, have you done something: “... immoral where you caused physical or emotional harm to somebody or something?” (harm) “... unfair?” (unfairness) “... immoral that involved dishonesty?” (dishonesty) “... immoral that involved breaking the rules?” (subversion) “... that was immoral because it involved something impure, indecent, or against your religious standards?” (degradation) “... disloyal towards a group or person who would've expected better?” (disloyalty) “... that was immoral because it involved a lack of self-discipline?” (lack of self-discipline) “... immoral that sticks in your mind but doesn't fall into the categories I've already mentioned?” (other).

After the interview, participants rated visual perspective, vividness, and anxiety, experienced while visualizing each memory, starting with the most guilt-provoking memory, and continuing for 10 min or until they had rated all memories.

Participants were then randomly allocated to re-visualize and re-rate both their intrusions and memories from either the first-person perspective or third-person perspective:

You must now focus on visualizing the intrusions and memories we've rated today predominantly in the first person [third person], as though you are seeing it through your own eyes [through the eyes of another person, or a camera hovering in the air]. We will start with the intrusions you rated earlier. Do your best to visualize the intrusion from start to finish in the first person [third person], with as little third person [first person] perspective as you can manage. Please use only information that was in your spontaneous intrusion, do not elaborate or embellish your intrusion.

Analysis

Sample characteristics of the first-person and third-person conditions were compared with independent-samples *t*-tests and Chi-Squared analyses. Hypotheses were assessed through multilevel models using the mixed procedure in SPSS 24.0, with intrusions and memories nested within participants (Field and Wright 2011; Hoffman and Rovine 2007; Silvia 2007). Each analysis included a random intercept for participants, allowing, for instance, individuals to vary in the mean level of anxiety they reported in association with their intrusions and memories. Preliminary analysis did not support linear growth models or random slopes. In addition to estimating the effects and significance tests for the hypothesized predictors, each analysis reports improvement in model fit (if any) compared to a baseline model with no

predictors. Overall models were considered significant (i.e., better than a model with no predictors) if improvements in $-2 \text{ Log Likelihood } (\Delta - 2LL)$ exceeded the relevant Chi-Squared statistic and the Akaike information criterion (ΔAIC) decreased (Hoffman and Rovine 2007). In addition, each model reports the residual variance (variance unaccounted for by within-subjects predictors, such as visual perspective) and random intercept variance (variance unaccounted for by between-subjects predictors, such as OC-symptoms). Maximum-likelihood estimation ensured the small number of cases with partially-missing data could be included in analysis.

Results

Participants reported experiencing multiple intrusive pictures ($M = 5.4$, $SD = 3.1$, range 0–13) over the past 3 months. Doubting intrusions were most prevalent (74.1%), but participants most frequently rated intrusions related to themselves or significant others becoming victims of violence as their most anxiety-provoking intrusion (30.8%). Table 1 lists proportions of overall and most distressing intrusions/memories. Participants also reported multiple memories of immoral actions over the past 3 months ($M = 4.6$, $SD = 2.0$, range 0–11), and most frequently rated causing harm to people, animals, or the environment as their most guilt-provoking memory (29.4%). Following randomization ($n = 72$ field, $n = 71$ observer), there were no group differences on demographic characteristics, OC-symptoms, or baseline psychological distress. Owing to time constraints, participants provided individual ratings on the 386 most anxiety-provoking intrusions of 771 total reported, and 396 most guilt-provoking memories of 656 total. Thus, the following analyses are generalizable only to imagery of above-average distress.

Table 1 Most prevalent and most distressing intrusions reported and immoral actions remembered

Intrusive mental picture [n (%) of sample experiencing]				Immoral action [n (%) of sample endorsing]			
Prevalence ^a		Most anxiety-provoking		Prevalence ^a		Most guilt-provoking	
Doubting	106 (74.1)	Violence (by others)	44 (30.8)	Undisciplined	100 (75.9)	Harm	42 (29.4)
Violence (by others)	102 (71.3)	Doubting	31 (21.7)	Dishonesty	108 (75.5)	Undisciplined	29 (20.3)
Other	80 (55.9)	Other	26 (18.2)	Harm	99 (69.2)	Dishonesty	23 (16.1)
Aggression (by self)	73 (51.0)	Aggression (by self)	18 (12.6)	Unfairness	77 (53.8)	Unfairness	19 (13.3)
Sexual	53 (37.1)	Sexual	13 (9.1)	Disloyalty	66 (46.2)	Disloyalty	13 (9.4)
Contamination	44 (30.8)	Immoral	7 (4.9)	Subversion	49 (34.3)	Degradation	7 (4.9)
Immoral	40 (28.0)	Contamination	2 (1.4)	Degradation	19 (13.3)	Subversion	7 (4.9)
Religious	11 (7.7)	Religious	0 (0.0)	Other	9 (6.3)	Other	2 (1.4)
None reported	2 (1.4)	None reported	2 (1.4)	None reported	1 (0.7)	None reported	1 (0.7)

^aPercentages do not add up to 100 because participants could experience/endorse multiple intrusions/memories

Baseline Associations

At baseline, the average visual perspective of intrusions ($M=3.52$ out of 5, $SD=1.08$) and memories ($M=3.62$ out of 5, $SD=0.99$) was more strongly field than observer. The intraclass correlation (ICC 14.4%) and design effect statistic (1.64) for visual perspective suggested that participants varied systematically in their level of baseline visual perspective (Peugh 2010), supporting the use of multilevel modelling. Entering OCI-R scores, image type (intrusion vs. memory), and their interaction into a multilevel model predicting visual perspective significantly improved the overall fit compared to the random intercept-only model, $\Delta - 2LL = -28.4$, $p < 0.001$, $\Delta AIC = 24.4$. The OCI-R by image type interaction was not significant, standardized beta = 0.06, $SE=0.07$, $t=0.79$, $p=0.43$, so the model was reduced to main-effects only for clarity of reporting.

The effect of OCI-R score was significant, standardized beta = -0.13 , $SE=0.06$, $t=-2.34$, $p=0.02$, with higher OC-symptoms at prescreen associated with stronger observer perspective of intrusions and memories. Intrusions did not differ from memories in their baseline visual perspective, standardized beta = -0.09 , $SE=0.07$, $t=-1.36$, $p=0.17$, controlling for OC-symptoms. The covariance estimates suggested that significant variation in visual perspective remained between participants (Est=0.14, $SE=0.04$, $p < 0.001$) and images (Est=0.85, $SE=0.05$, $p < 0.0001$).

On average, participants rated their imagery as being vivid (intrusions $M=3.56$ out of 5, $SD=0.76$; Memories $M=3.62$, $SD=0.82$), somewhat distressing during everyday life (intrusions $M=2.04$ out of 5, $SD=1.29$; Memories $M=1.53$, $SD=1.29$), and anxiety-provoking to visualize in session ($M=49.59$ out of 80, $SD=12.76$; Memories $M=49.84$, $SD=12.82$). Although relatively less participant-level variance was associated with vividness

(ICC = 15.5%, design effect = 1.69), there was substantial variance between participants for intrusion-related distress during everyday life (ICC = 34.8%, design effect = 2.55) and anxiety while visualizing in session (64.1%, design effect = 3.85). Subsequent multilevel analyses assessed associations of OC-symptoms, visual perspective, image type (intrusion vs. memory), and their two-way interactions with the baseline vividness, everyday distress, and state anxiety. For clarity, non-significant interactions were dropped from the models before reporting. Standardized relationships are presented in Table 2.

Vividness was associated only with visual perspective, with field intrusions and memories being more vivid. There was no significant difference in vividness between intrusions and memories, nor a significant association between OCI-R score and image vividness. Intrusions were rated as being more distressing than memories when occurring spontaneously in everyday life. Furthermore, spontaneous images (intrusions and memories) were rated as more distressing when they were in field perspective, and people with high OCI-R scores found both spontaneous intrusions and spontaneous memories more distressing; the strength of these relationships did not interact with image type.

State anxiety while visualizing at baseline was associated with visual perspective and OCI-R score, but the strength of these relationships was determined in interaction with image type (Table 2). There was a weak significant relationship between field perspective and state anxiety for memories, Standardized beta = 0.07, $SE=0.04$, $t=2.06$, $p=0.04$, but no significant association for intrusions, Standardized beta = -0.03 , $SE=0.03$, $t=-0.98$, $p=0.33$. There also was a significant positive association between OC-symptoms and state anxiety while visualizing memories, Standardized beta = 0.26, $SE=0.07$, $t=3.71$,

Table 2 Baseline associations of visual perspective, OCI-R, and image type with outcomes

	Vividness		Distress		State anxiety	
	Estimate	SE	Estimate	SE	Estimate	SE
Fixed effects (standardized)						
Visual perspective	0.28***	0.05	0.09**	0.03	0.07*	0.04
OCI-R	0.02	0.05	0.19***	0.06	0.26***	0.07
Image type – intrusion [vs. Memory]	-0.06	0.06	0.36***	0.06	-0.09*	0.04
Perspective × Image type	-	-	-	-	-0.11*	0.05
OCI-R × Image type	-	-	-	-	0.10*	0.05
Variance components						
Residual variance	0.79***	0.04	0.61***	0.03	0.35***	0.02
Random intercept variance	0.12***	0.03	0.32***	0.05	0.54***	0.07
Fit statistics						
$\Delta - 2LL$	-88.6***		-78.2***		-59.1***	
ΔAIC	-82.6		-72.2		-49.1	

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

$p < 0.001$, and this relationship was even stronger for intrusions, Standardized $b = 0.35$, $SE = 0.07$, $t = 4.94$, $p < 0.001$.

Effect of Manipulation

To assess whether instructing participants to adopt a field/observer view did indeed change the visual perspective of their intrusions and memories, experimental condition (field, observer), image type (intrusion, memory), and their interaction were entered into a multilevel model predicting post-manipulation visual perspective from pre-manipulation visual perspective. Results are depicted as changes from the pre-manipulation mean, achieved by centering pre- and post-scores on the pre-manipulation grand mean. There was a significant effect of experimental condition (Table 3), with no effect of image type or condition by image interaction. Visual perspective was rated as more strongly field after the field instruction for intrusions $M_{diff} = 0.48$, $SE = 0.07$, $t = 6.96$, $p < 0.005$, Cohen's $d = 0.41$, and memories, $M_{diff} = 0.47$, $SE = 0.07$, $t = 6.89$, $p < 0.005$, $d = 0.41$ (Fig. 1). Conversely, visual perspective was rated more strongly observer after the observer instruction for intrusions, $M_{diff} = -1.37$, $SE = 0.07$, $t = -19.48$, $p < 0.005$, $d = -1.17$, and memories, $M_{diff} = -1.36$, $SE = 0.07$, $t = -19.52$, $p < 0.005$, $d = -1.17$. Hence, the manipulation was effective in changing the visual perspective of both types of imagery. Subsequent hypothesis testing used an analogous design.

Image vividness was significantly influenced by experimental condition (Table 3). Vividness was not significantly influenced by instructions to visualize in a field perspective for intrusions, $M_{diff} = 0.03$, $SE = 0.06$, $t = 0.64$, $p = 0.53$, $d = 0.05$, or memories, $M_{diff} = 0.02$, $SE = 0.06$, $t = 0.27$, $p = 0.79$, $d = 0.02$ (Fig. 1). However, vividness decreased after instructions to visualize from an observer perspective for intrusions, $M_{diff} = -0.21$, $SE = 0.06$, $t = -3.53$, $p < 0.001$,

$d = -0.26$, and memories, $M_{diff} = -0.18$, $SE = 0.06$, $t = -3.17$, $p = 0.002$, $d = -0.22$. There was no main effect of image type nor a condition by image interaction.

State anxiety while visualizing intrusions and memories was determined by experimental condition in interaction with image type (Table 3). Consistent with predictions, state anxiety increased following instructions to visualize in a field perspective for intrusions, $M_{diff} = 2.77$, $SE = 0.92$, $t = 3.01$, $p = 0.003$, $d = 0.20$, and memories, $M_{diff} = 2.47$, $SE = 0.91$, $t = 2.70$, $p = 0.008$, $d = 0.18$ (Fig. 1). Contrary to predictions, state anxiety was not significantly different after instructions to visualize intrusions from an observer perspective, $M_{diff} = 0.10$, $SE = 0.93$, $t = 0.11$, $p = 0.92$, $d = 0.01$. State anxiety unexpectedly increased while visualizing memories from the observer perspective, $M_{diff} = 2.05$, $SE = 0.92$, $t = 2.22$, $p = 0.03$, $d = 0.15$.

Discussion

The primary aim of the current study was to examine the impact of visual perspective on the experience of obsessional images in a high-OCD symptom sample of undergraduate students. It is the first study, to our knowledge, to experimentally examine the field-observer distinction within the context of OCD. We also wished to contrast any visual perspective effects on obsessional images with effects of visual perspective on memory-based images. Previously, visual perspective has been found to influence the phenomenology of mental images, such that natural field images are typically accompanied by a heightened subjective experience, including increased sensory and emotional arousal, relative to natural observer images (e.g., Berntsen and Rubin 2006). In the current study, associations between natural visual perspective and vividness

Table 3 Overall effects from mixed models measuring vividness and state anxiety after experimental manipulation

	Visual perspective			Vividness			State anxiety		
	<i>df</i>	<i>F</i>	<i>p</i>	<i>df</i>	<i>F</i>	<i>p</i>	<i>df</i>	<i>F</i>	<i>p</i>
Tests of fixed effects									
Pretest value of DV	1, 683.7	7.29	0.007	1, 759.6	203.88	<0.001	1, 664.2	299.03	<0.001
Experimental condition	1, 140.4	402.80	<0.001	1, 131.1	10.85	0.001	1, 110.9	1.68	0.20
Image type	1, 628.6	0.01	0.93	1, 655.1	<0.01	0.98	1, 603.8	2.44	0.12
Condition × image type	1, 528.8	0.02	0.90	1, 654.8	0.23	0.63	1, 603.2	4.54	0.03
Variance components									
	Estimate (SE)			Estimate (SE)			Estimate (SE)		
Residual variance	0.22*** (0.01)			0.40*** (0.02)			50.20*** (2.95)		
Random intercept variance	0.25*** (0.04)			0.08*** (0.02)			40.01*** (6.85)		
Fit statistics									
Δ-2LL	-189.8***			-10.6*			-8.4*		
ΔAIC	-183.8			-4.6			-2.4		

* $p < 0.05$, *** $p < 0.001$

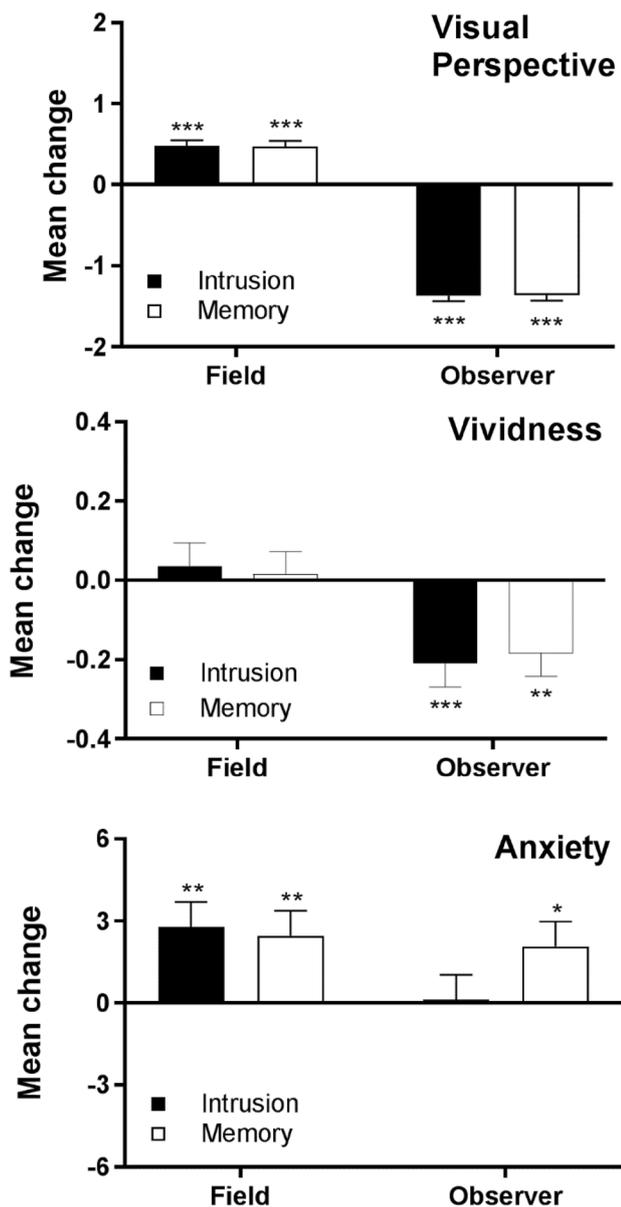


Fig. 1 Mean change from baseline visual perspective, vividness and anxiety while visualizing intrusions and memories following instructions to adopt a field or observer person visual perspective. Bars represent 1 standard error. Significance values test for change from baseline within each group. * $p < .05$; ** $p < .01$; *** $p < .001$

and distress were consistent with the extant literature. These associations indicated that, for both intrusions and memories, images experienced in more of a field perspective tended to contain richer sensory and affective representations. The correlational nature of these findings, however, precludes directional inferences. Indeed, it is possible that individuals who were more predisposed to adopt a greater field perspective during mental imagery, were also more adept at constructing vivid, compelling, and emotionally arousing mental images.

Results regarding baseline associations between OCD symptomatology and visual perspective were contrary to both our hypotheses and the previous literature in OCD. Higher OCD symptoms were associated with greater natural observer perspective for both intrusions and memories. This finding conflicts with previous research observing a preponderance of field images in OCD (Coughtrey et al. 2013, 2015; Lipton et al. 2010; Speckens et al. 2007). As previously noted, however, much of this previous research was limited by very small sample sizes and, in several cases, the absence of an appropriate comparison group.

Our finding of an association between OCD symptoms and greater observer perspective does, however, echo previous research on visual perspective and other types of psychopathology. In both depression and PTSD, intrusive images have been found to be experienced in an observer perspective (Kenny and Bryant 2007; Kuyken and Moulds 2009; Williams and Moulds 2007a). The prominence of an observer mode of imagery in these disorders has been attributed to associations with cognitive avoidance. Williams and Moulds (2007) and Kuyken and Moulds (2009) found that for students high in dysphoria and individuals with a history of recurrent depression, respectively, adoption of an observer perspective during recall of negative memories was associated with measures of avoidance, including dissociation and rumination. Similarly, Kenny and Bryant (2007) found that avoidant individuals were more likely to report adopting an observer perspective when recalling a traumatic event when compared to less avoidant individuals. The authors suggested that individuals with depression and PTSD might preferentially adopt an observer perspective during intrusive imagery in an attempt to avoid the negative affect associated with their images.

Although we did not include measures of cognitive avoidance in the current study, our findings raise the possibility that participants with high levels of OCD symptoms, like those with elevated depression or PTSD symptoms, tended to adopt an observer perspective for anxiety-provoking images in order to dampen or avoid the anxiety and vividness associated with them. A transdiagnostic tendency to avoid distressing images via adoption of an observer perspective would explain our seemingly contradictory findings that higher OCD symptoms were associated both with more image-related anxiety and distress *and* greater observer perspective, which is typically associated with a reduced affective response.

Turning to the instructed visual perspective, our hypotheses that an instructed field visual perspective would be associated with increased anxiety and vividness, whereas instructed observer perspective would be associated with decreased anxiety and vividness, were partially confirmed. Participants shifted to an observer perspective did report decreased imagery vividness for both memories and

intrusions. These findings are consistent with those of McIsaac and Eich (2004), who found that intrusive field images in PTSD contained richer sensory and affective content compared to intrusive observer images, and Williams and Moulds (2008), who found that shifting dysphoric individuals from a field to an observer perspective when recalling an intrusive memory resulted in decreased vividness and distress. Together, these findings imply that adoption of an observer perspective during intrusive imagery does indeed distance an individual from the sensory components of their image.

Although observer perspective decreased vividness, field perspective did not lead to a corresponding enhancement in vividness. This is consistent with the general observations of Butler et al. (2016) who has suggested that vividness is greater in first-person because that is the natural perspective. Shifting participants to third person thus results in a decrease in both vividness and intensity of emotion (Berntsen and Rubin 2006; Robinson and Swanson 1993; Williams and Moulds 2008). However, when memories are naturally remembered from a third-person perspective, shifting to a first-person perspective has little or no effect on memory phenomenology. The asymmetry of these findings may be due to a lack of availability of visual information from the original event that may be critical to reporting a memory from a third-person perspective (Butler et al. 2016). Although natural field intrusions and field memories were rated as more vivid, moving to a more field perspective may not influence vividness for images if relevant details are unavailable.

The effects of the perspective manipulation on state anxiety were also asymmetrical. As predicted, participants shifted to a field perspective reported increased state anxiety relative to baseline for intrusions and memories, suggesting that field perspective activated emotions related to the imagery. Clinically, increased emotional activation associated with the intrusion may reflect reduced cognitive avoidance, which may facilitate emotional processing (Foa and Kozak 1986). Observer perspective, however, was not associated with decreased anxiety for intrusions. Moreover, for memories, shifting to *either* a field or observer perspective led to increased anxiety in response to the image relative to baseline. This finding contrasts with previous work showing a reduction in anxiety associated with observer perspective for intrusive memories (Williams and Moulds 2008). The unanticipated effect of instructed observer perspective may be related to methodological features of the current study. Whereas Williams and Moulds (2008) utilised naturally occurring intrusive memories, our procedure may have led to recall of unpleasant memories that were not regularly intruding upon or bothering participants. Re-imagining this newly retrieved memory from an instructed observer perspective may have not only failed to have an anxiolytic

impact, but rather further sensitized participants to the distressing memory. We are unable, however, to disentangle the impact of engaging with the memory a second time from the impact of an instructed visual perspective, as both instructed perspectives were associated with increased anxiety. Inclusion of a repetition-only control condition would be critical for future studies.

The present research highlights the importance of considering the potential role of visual perspective in intrusive imagery and suggests important pathways for future research. Intrusive images are conceptualized as an indication of unsuccessful emotional processing (Rachman 1980). According to Foa and Kozak (1986), effective emotional processing requires the activation and integration of the affective and conceptual aspects of an emotional experience. Such integration enables an individual to link the experience with other autobiographical knowledge, and thereby incorporate both event-specific information and general information about the type of event and the lifetime period that the event took place into their mental representation of the experience (Ehlers and Clark 2000). Sensory-affective representations are thus recoded into abstract, meaning-based representations and intrusive images are inhibited (Engelhard et al. 2010; Hackmann and Holmes 2004; Williams and Moulds 2007).

The strategy of repeated adoption of an observer perspective in intrusive imagery is not associated with improved longer term outcomes (Kuyken and Moulds 2009). It might hinder emotional processing, as access to emotional material may be limited. For positive memories in depression, Holmes et al. (2008) suggested that promoting a switch from observer to field perspective may be beneficial for the promotion of positive affect. Although the observer perspective may be adopted to reduce the immediate aversive emotional effects of imagery, it seems also to have the unintended consequence of maintaining some disorders by focusing attention on a stereotyped and distorted image rather than on sources of more positive information.

In OCD, the adoption of a field perspective in intrusive obsessional imagery may be an important aspect of imaginal exposure or imagery-rescripting treatment. Merely recalling an intrusive thought in field perspective however, may not be sufficient to facilitate emotional processing, as such images occur frequently in OCD and evoke substantial distress (Lipton et al. 2010; Speckens et al. 2007). Adoption of a field perspective in such imagery might heighten activation of affective material, but limit the integration of such material with conceptual and autobiographical knowledge. Perhaps, then, clinicians may consider behavioral experiments in which intrusive obsessional images are experienced in *both* a field and an observer perspective in order to allow for the integration of the affective and conceptual representations of the imaged event. Exposing an OCD patient to

their intrusive image from a field perspective might activate the affective components of the image. Subsequent exposure from an observer perspective might encourage patients to activate a contextual representation of the imaged event. This increased flexibility in visual perspective may allow the image to be integrated into one's autobiographical knowledge base and transformed into an abstract, rather than sensorially and affectively rich, mental representation.

Future research may also investigate whether the impact of visual perspective for obsessional images depends on the types of intrusive images being recalled. As OCD is a heterogeneous disorder, it is possible that manipulating perspective for OCD imagery related to imminent physical harm, such as whether a door is unlocked or a surface is contaminated, has a different effect than obsessional imagery that is deemed immoral (e.g., shouting an obscenity in church; touching one's pet in an inappropriate way). Future studies should also include a behavioral measure to assess the impact of manipulating perspective on urge to control one's thought or perform a neutralizing behavior (i.e., a compulsion).

In conclusion, the findings of the current research suggest that visual perspective may play an important role in influencing the phenomenology of intrusive obsessional images. Additional research is needed to determine the boundaries and moderators of these effects, yet these findings provide preliminary support for the notion that visual perspective and mental imagery should be considered in the conceptualization and treatment of intrusive images in OCD.

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Compliance with Ethical Standards

Conflict of Interest Jessica R. Grisham, Savannah Miniham and Caleb J. Winch declare that they have no conflict of interest.

Ethical Approval Ethical approval for the reported research was obtained by the University of New South Wales Human Research Advisory Panel (UNSW HREAP) and all procedures performed in the current research were in accordance with the ethical standards of UNSW HREAP.

Research Involving in Human Participants The current research involved human participants.

Informed Consent Informed consent was obtained from all participants prior to participation in the study.

Animal Rights No animal studies were carried out by the authors for this article.

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