The Appraisal of Intrusive Images Among Outpatients with Social Anxiety Disorder

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Abstract

Recurrent intrusive images exist across mental disorders, although their specific content varies depending on disorder. However, research on how patients appraise these images has mostly been limited to studies on obsessive-compulsive disorder (OCD). One question concerns whether cognitive behavioral models of OCD are relevant for appraisal processes of intrusive images in other disorders. In this study, it was examined whether patients with social anxiety disorder (SAD) endorse three types of beliefs in relation to intrusive images that have been hypothesized as being specific to OCD (importance of thoughts, responsibility, and control of thoughts). In addition, appraisals of intrusive images in SAD were explored with content analyses. Participants were 35 outpatients (M age = 28.3; SD = 11.5; 54.3% female) at an anxiety treatment center in Iceland diagnosed with SAD (according to the Mini International Neuropsychiatric Interview; MINI), as a primary diagnosis.

Participants were interviewed with a semi-structured interview to assess imagery in SAD, which was adapted to focus specifically on appraisals of intrusive images, and ensuing compulsive and other strategies. Sixty percent of the participants reported experiencing clinically significant intrusive images with all of those patients appraising the image as having a negative meaning about themselves. Most SAD patients endorsed beliefs and appraisals of intrusive images that have been hypothesized to be specific to OCD. However, content analysis revealed that the most significant appraisals seemed specific to SAD, such as beliefs of having a flawed or a weak self, and believing others to be critical or cruel. There appear to be greater similarities between appraisal processes in SAD and OCD than previously believed. Future directions and treatment implications are discussed.

Keywords: Appraisals, intrusive images, obsessive-compulsive disorder, social anxiety disorder.
Unwanted intrusive thoughts, images, or impulses are experienced by most, if not all, people (Clark & Radomsky, 2014). These intrusions are known to suddenly pop up into awareness and often cause powerful emotional reactions that can interfere with current cognitive or behavioral activity, which sets them apart from other kinds of clinically-significant thoughts such as worries and negative automatic thoughts (Clark & Rhyno, 2005; Julien, O’Connor, & Aardema, 2007). These intrusive cognitions and related distress can provoke people to action intended to regulate or gain control of them, which can cause these thoughts to become recurrent and develop into clinical obsessions (Clark & Rhyno, 2005). Although intrusive thoughts are experienced by most people, obsessions (which are more frequent, cause more discomfort, and are more difficult to control) are only experienced by a minority (Rachman, 1971, Rachman & de Silva, 1978; Salkovskis, 1999). According to cognitive-behavioral therapy (CBT) models of obsessive-compulsive disorder (OCD) (see e.g., Clark & O’Connor, 2005) intrusive thoughts can develop into obsessions that are, in turn, maintained by compulsions if they are appraised in accordance with certain pre-existing beliefs. Once developed, obsessions and compulsions are thought to be the primary maintaining process in OCD (American Psychiatric Association, 2013).

However, clinically significant recurrent intrusive thoughts, images and impulses exist in a variety of psychological disorders (Brewin, Gregory, Lipton, & Burgess, 2010; Hackmann, Bennet-Levy, & Holmes 2011; Ladouceur et al., 2000) which gives rise to the question of whether obsessions and compulsions may be a maintaining factor across mental disorders (Bjornsson & Phillips, 2014)? In social anxiety disorder (SAD), some forms of intrusive cognitions are known to be common (Clark & Wells, 1995). Most patients diagnosed with SAD experience distressing intrusive images, especially when in social situations (Hackmann, Surawy, & Clark, 1998; Hackmann, Clark, & Macmanus, 2000). In general, intrusive images are broadly defined as mental representations possessing sensory qualities
(such as a brief video in which the individual is making a fool of himself while giving a presentation), that are often intense and can occur unexpectedly, frequently and repetitively (Horowitz, 1970; Speckens, Hackmann, Ehlers, & Cuthbert, 2007). These vivid images generally intrude upon consciousness, often causing significant distress (Rachman, 2007), and therefore may have a similar or even a greater effect on emotions and behavior than verbal thoughts (Hackmann et al., 2010; Holmes, & Mathews, 2005). Most people experience visual intrusive images, although various other sensory modalities such as auditory, bodily, tactile, olfactory and gustatory sensations are reported (see e.g., Speckens et al., 2007). Images can also have a strong link with autobiographical memories of adverse events in the past (Conway & Pleydell-Pearce, 2000; Hackmann et al., 2000).

The content of the intrusive image in SAD generally centers around what the individual fears might happen in a particular social situation, seen from the perspective of others (i.e., observer perspective; Hackmann et al., 1998; 2000). It is, therefore, not uncommon that patients with SAD experience recurrent, excessively negative, intrusive images revolving around themes such as looking awkward (e.g., stuttering, blushing or visibly sweating), or of others showing them disinterest, or criticizing, teasing or even bullying them (Clark & Wells, 1995; Hackmann et al., 2000; Wells, Clark, & Ahmad, 1998). External cues (e.g., social situations) and internal cues (e.g., thoughts or physical sensations) can trigger images in SAD patients, who have commonly been found to experience the image as if the event in the image was actually taking place (Wells & Papageorgiou, 1999). Images in SAD have also been connected to adverse social experiences in the past, centering around the onset of the disorder, and they generally persist when left untreated, highlighting their part in the development and persistence of the disorder (Hackmann et al., 2000).

Various cognitive behavioral therapy (CBT) models of SAD have incorporated intrusive imagery as an important feature of the disorder (see e.g., Clark & Wells, 1995;
In the cognitive model of SAD by Clark and Wells (1995), it is assumed that intrusive imagery is related to anxiety in various ways. A patient can for example experience a distressing image of him- or herself looking red in the face and sweating profusively before, during, or after entering a social situation. This experience can contribute to anxiety and fear in the situation, and make the patient shift his or her attention inward (i.e., self-focused attention), and thus, be more likely to notice anxiety symptoms (e.g., blushing), which can, in turn, make the intrusive image more salient. Attempts to correct this disorted image with video feedback are often one of the first steps in the treatment of SAD (Clark, 2005), highlighting the important role intrusive images can play in SAD. However, despite this central role, there is very little research on intrusive images in SAD, in particular on the role of appraisal of intrusive images and of ensuing reactions to the images in the form of compulsive or other types of strategies.

What is known about appraisals of thoughts in SAD has up until now focused on negative automatic thoughts and other non-intrusive cognitions. Generally, people with SAD are overly concerned about the negative evaluation of others, especially regarding the visibility of their anxiety symptoms and potential for impaired performance (Schultz et al., 2006). It has also been maintained that individuals with SAD generally have a high degree of perfectionism regarding social situations (Frost, Glossner, & Maxner, 2010), coupled with unrealistically high social standards (Hofmann, 2007), and percieved inadequacy in initiating and/or maintaining interpersonal relationships (Alden & Regambal, 2010). In addition, fears of revealing self-attributes that the patient regards as flawed or inadequate are common (Moscovitch, 2009). We can, therefore, hypothesize that individuals with SAD will be likely to appraise intrusive images centered around performance deficits, negative self-attributes, rejection, criticism, and humiliation as revealing something about who they are as they relate
to other people. There is, however, no extant research on how intrusive images are appraised in the context of SAD.

Research on appraisals of intrusive images and consequent reactions to them in the form of compulsive and other strategies has been exclusive to OCD and related disorders such as body dysmorphic disorder (BDD; e.g., Lipton, Brewin, Linke, & Halperin, 2010; Veale & Neziroglu, 2010). However, unwanted intrusive images that are content-specific with regard to various disorders (such as images involving fear of dying in panic disorder and images of details of the traumatic event in post-traumatic stress disorder) are considered clinically significant across mental disorders (e.g., Brewin et al., 2010; Hackmann, Bennett-Levy, & Holmes, 2011). According to CBT models of OCD (see e.g., Clark & O’Connor, 2005), unwanted intrusive cognitions (often in the form of images) can become recurrent and develop into clinical obsessions if they are appraised as carrying a threat to their sense of self, which might be rooted in early attachment patterns (see e.g., Doron, Sar-El, & Mikulincer, 2012; Rowa, Purdon, Summerfeldt, & Antony, 2005), with ensuing compulsive strategies. More specifically, particular types of appraisals (e.g., believing one could be dangerous due to having an aggressive thought) of unwanted intrusive images could make a person more likely to react to the image with compulsive strategies (e.g., overt or covert attempts at neutralizing the thought; Rachman, 1997; Salkovskis, 1999). These strategies inhibit new learning (e.g., realizing that having the thought is harmless), and reduce distress in the moment in a process of negative reinforcement and consequently strengthen the unwanted intrusive image, until a clinical obsession has developed (Rachmann, 1998).

The Obsessive-Compulsive Cognitions Working Group (OCCWG, 2003) has maintained that there are three types of beliefs and appraisals that are exclusive to the development and maintenance of OCD. They are ‘responsibility’ (e.g., ‘it would be immoral to ignore this thought’), ‘over-importance of thoughts’ (e.g., ‘this image must be important
because it occurred’), and ‘thought control’ (e.g., ‘I should be able to have control over my thoughts’). However, patients diagnosed with a variety of other anxiety disorders have often scored high on measures designed to measure these “OCD specific beliefs”. A frequently used measure is The Interpretation of Intrusions Inventory (III) (OCCWG, 2001; Steketee et al., 2003). Lipton et al., (2010) evaluated how OCD patients appraised intrusive images compared to anxiety controls, and found that the groups did not significantly differ in the extent to which they adopted these appraisal categories, except with regard to ‘responsibility’. Their findings suggest that appraisals believed to be specific to OCD could also apply to other anxiety disorders, which raises the question of what role intrusive images and how they are appraised and what reactions they provoke could play in other disorders. Lipton et al. (2010) identified, using content analyses, some types of appraisal that may distinguish between the two groups. OCD patients were much more likely to infer from the intrusive images that they possessed a ‘dangerous self’, whereas anxiety controls were more likely to infer a ‘flawed self’.

This research project builds upon the assumption that the general CBT framework of how OCD develops and persists offers the most parsimonious account for understanding how individuals across mental disorders appraise unwanted intrusive images and react to them with compulsive and other strategies, which may, over time, create a maintaining process of obsessions and compulsions. In light of the fact that clinically significant unwanted intrusive images exist in many mental disorders (see e.g., Brewin et al., 2010), we assume that similar appraisal processes (which may be content-specific with depending on particular mental disorder) and resulting compulsive strategies could develop across these disorders as well (Bjornsson & Phillips, 2014).

A previous study from this research project using the same data set (Þorvaldsson, 2015) found that 90% of SAD outpatients that experience recurrent intrusive images reported
one or more strategies in reaction to the image which met our criteria for being considered a compulsive strategy (i.e., feeling compelled to perform the strategy at least 50% of the time and conducting the strategy in order to reduce distress in the moment). These findings suggest that obsessions and compulsions may develop and be maintaining process for at least some individuals who suffer from SAD.

In this study, appraisals of intrusive images in SAD were explored. We wanted to examine whether SAD patients endorsed appraisals believed to be specific to OCD patients, in response to their most common intrusive image. Furthermore, we performed content analyses of the appraisals of the SAD patients, in an attempt to identify types of appraisal that may be specific to the disorder. In addition, we wanted to replicate studies on the frequency, content, and characteristics of images in SAD (with reference to Hackmann et al., 2000).

**Methods**

**Participants**

Participants were 35 outpatients (M age = 28.3, SD = 11.5; 54.3% female; see Table 1 for background variables and clinical characteristics), with a primary diagnosis of SAD, seeking treatment at the Icelandic Center for Treatment of Anxiety Disorders. This center specializes in cognitive behavioral therapy (CBT) for SAD and other anxiety disorders. Participants were offered CBT group therapy at a discount for taking part in the study. Inclusion criteria were to be 18 years or older, having a primary diagnosis of SAD (i.e., their most impairing disorder), and having the ability to understand and tolerate the questions on the clinical interviews and self-report measures.

The most common co-morbid disorders for the SAD group were: major depressive disorder (25.7%), body dysmorphic disorder (14.3%) and panic disorder with agoraphobia (11.4%; see Table 1). Only two (5.7%) out of 35 patients did not meet the criteria for generalized social anxiety disorder (i.e., they had moderate or high anxiety and/or fear in at
least 12 situations, in addition to a total score of 60 or higher on The Liebowitz Social Anxiety Scale (LSAS)).

Patients LSAS scores ($M = 82.7$, $SD = 20.7$) and scores on the Social Phobia Weekly Summary Score (SPWSS; $M = 28.0$, $SD = 7.8$) indicate moderate to severe social anxiety symptoms (Heimberg et al., 1999) and LSAS scores are similar to reported scores of SAD outpatients in other studies (Mennin et al., 2002). The patients scores on a measure of depression symptoms (Patient Health Questionnaire 9; $M = 10.0$, $SD = 6.8$) are consistent with mild to moderate depression. Patients had, on average, moderate functional impairment as indicated with scores on the Sheehan Disability Scale (SDS; $M = 172.0$, $SD = 52.5$) and relatively low quality of life scores (Quality of Life Scale; $M = 66.8$, $SD = 10.8$). The measures are described in detail below.
Table 1. Background variables and clinical characteristics of the SAD group.

<table>
<thead>
<tr>
<th>Variables</th>
<th>n (%) or mean +/- standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Demographic variables</strong></td>
<td></td>
</tr>
<tr>
<td>Age (M +/- SD)</td>
<td>28.3 (11.5)</td>
</tr>
<tr>
<td>Gender (% female)</td>
<td>19 (54.3)</td>
</tr>
<tr>
<td>Nationality (% Icelandic)</td>
<td>35 (100.0)</td>
</tr>
<tr>
<td>Education (% Junior College or more)</td>
<td>15 (42.9)</td>
</tr>
<tr>
<td>Currently a student (%)</td>
<td>14 (45.2)^b</td>
</tr>
<tr>
<td>Married or living with a partner (%)</td>
<td>15 (42.9)</td>
</tr>
<tr>
<td><strong>Comorbidity (MINI)^j</strong></td>
<td></td>
</tr>
<tr>
<td>Major depressive disorder</td>
<td>9 (25.7)</td>
</tr>
<tr>
<td>Bipolar II disorder</td>
<td>1 (2.9)</td>
</tr>
<tr>
<td>Panic disorder with agoraphobia</td>
<td>4 (11.4)</td>
</tr>
<tr>
<td>Agoraphobia without panic</td>
<td>1 (2.9)</td>
</tr>
<tr>
<td>Obsessive compulsive disorder</td>
<td>2 (5.7)</td>
</tr>
<tr>
<td>Posttraumatic stress disorder</td>
<td>2 (5.7)</td>
</tr>
<tr>
<td>Alcohol dependence</td>
<td>3 (8.3)</td>
</tr>
<tr>
<td>Alcohol abuse</td>
<td>1 (2.9)</td>
</tr>
<tr>
<td>Drug dependence</td>
<td>1 (2.9)</td>
</tr>
<tr>
<td>Drug abuse</td>
<td>1 (2.9)</td>
</tr>
<tr>
<td>Generalized anxiety disorder</td>
<td>2 (5.7)</td>
</tr>
<tr>
<td>Body dysmorphic disorder</td>
<td>5 (14.3)</td>
</tr>
<tr>
<td><strong>Other clinical characteristics</strong></td>
<td></td>
</tr>
<tr>
<td>LSAS^e (M +/- SD)</td>
<td>82.7 (20.7)</td>
</tr>
<tr>
<td>PHQ-9^f</td>
<td>10.0 (6.8)^f</td>
</tr>
<tr>
<td>QOLS^g</td>
<td>66.8 (10.8)^f</td>
</tr>
<tr>
<td>SDS^h</td>
<td>172.0 (52.5)^f</td>
</tr>
<tr>
<td>SPWSS^i</td>
<td>28.0 (7.8)^f</td>
</tr>
</tbody>
</table>

^a n varies in some of the variables. ^b Four missing values. ^c Three missing values ^d Four missing values. ^e Liebowitz Social Anxiety Scale. ^f The Patient Health Questionnaire-9. ^g The Quality of Life Scale. ^h Sheehan Disability Scale. ^i Social Phobia Weekly Summary Scale. ^j All disorders were assessed with the MINI International Neuropsychiatric Interview (MINI) except for BDD which was assessed with the Body Dysmorphic Disorder Diagnostic Module (BDD-DM).
Measures

*The Imagery and Social Trauma Interview*

Images were assessed with this semi-structured clinical interview, based on earlier versions of imagery interviews (Hackmann et al., 2000; Lipton et al., 2010), which was adapted to focus on appraisal of the images and reactions to the images in the form of compulsive and other kinds of strategies. The second part of the interview, which is not relevant to the present study, consists of asking the participant about socially traumatic experiences.

First, the concept of intrusive images was explained to each participant with examples. The participant was then asked if, in the last 6 months, he had experienced recurrent intrusive images. If so, he was asked further question about the frequency of the image and asked to bring it into conscious awareness, and describe it in more detail. Moreover, the participant was asked about how vivid and intense the image was, what the sensory modality/modalities (e.g., sight) in which he experienced the image were, and whether he experienced it like a video or audio clip or like a still frame. He was also asked about the perspective from which the image was experienced (i.e., an observer, field or an alternating perspective), and which emotions (on a scale from 0-10) he experienced in response to the image and how much distress it had caused him in the week prior to the assessment.

Second, each participant was asked in an open-ended question whether he attaches any meaning to the image. If the participant had a hard time understanding the question, he was further probed if the image meant something about him, other people, and/or the world or the future. The participant was then asked to summarize in 1-2 sentences what the image meant to him, and then whether he believed that statement to be true. Further questions on meta-cognitive appraisal of the image were then asked: whether he experienced the image as if it
was really taking place, whether it was a premonition of something, and whether something bad would happen if he were to allow the image into his mind.

Thirdly, the participant was asked about how he tended to react to the intrusive image with an open-ended question, which was followed up by questions about specific strategies in the following categories; overt compulsions (e.g., checking behavior), reassurance seeking, mental compulsive behaviors (e.g. repeating sentences), neutralizing and thought control strategies (e.g., thought stopping, replacing the image with another image), safety behaviors (e.g., spending a lot of time preparing), behavioral avoidance (e.g., leaving the situation), coping behaviors (e.g., deep breathing), and doing nothing. The list of categories was based in part on Ladouceur et al. (2000). However, it is important to note that the strategies were not considered a priori to belong to any one of those categories. Each participant was asked follow-up questions to determine if certain of the strategies were, in fact, compulsive or other types of strategies. Compulsive behaviors (including neutralizing strategies) were defined as strategies in response to the intrusive image, with the function of reducing the distress in the moment caused by the image and that the individual felt compelled to do the strategy at least 50% of the time. These behaviors were considered to be usually (but not necessarily) repetitive.

The Mini International Neuropsychiatric Interview (MINI)

The MINI is a semi-structured, diagnostic interview that assesses Axis I psychiatric disorders according to the DSM-IV (APA, 2000; Sheehan et al., 1997). This interview has good psychometric properties, including high reliability with kappas (κs) ranging from high to very high, and good validity in connection to the Structured Clinical Interview for DSM-IV with inter-rater reliabilities ranging from .89-1.0, and good sensitivity and specificity for all diagnoses with the exception of agoraphobia (κ = .59), bulimia (κ = .53), and generalized anxiety disorder (κ = .36) (Lecrubier et al., 1997; Sheehan et al., 1997). We used an Icelandic
version of the MINI in this study, which has been shown to have good convergent validity with self-report measures of depression and anxiety symptoms (Sigurdsson, 2008).

*The Body Dysmorphic Disorder Diagnostic Module (BDD-DM)*

The BDD-DM is a brief semi-structured interview designed to diagnose body dysmorphic disorder (BDD). The interview has high inter-rater reliability ($\kappa_s = .96$) along with other good psychometric properties (Phillips, 2005). In order to be able to diagnose BDD according to DSM-5 (APA, 2013), a question regarding common behaviors in BDD (e.g., mirror checking) was added to the study in collaboration with the author of the original interview, Dr. Katharine Phillips. Two advanced graduate students in psychology translated the BDD-DM from English to Icelandic and the primary investigator and an expert in BDD (Dr. Bjornsson), combined the two translations into one final version.

*Interpretation of Intrusions Inventory (III: OCCWG, 2001)*

The III is a 31 item, semi-idiographic, self-report questionnaire designed to assess appraisals of a common unwanted intrusive thought, image or impulse. In this study the participant was asked to respond to statements (incorporating different appraisals) keeping in mind the intrusive image that had been assessed using the Imagery and Social Trauma Interview. The inventory embodies three domains (i.e., subscales) of appraisals reflecting three underlying beliefs thought to be specific to OCD: importance of thoughts, control of thoughts and responsibility. Participants are asked to rate the recency, frequency, and distress level of their intrusive image along with being asked to rate their belief for various statements relating to the image on a scale from 0-100. A total score for the measure and its subscales is calculated from these belief ratings, with higher scores signifying stronger beliefs in the interpretations. The III has shown great internal consistency (Cronbach alphas from .84-.89) and good test-retest reliability ($r = .69-.77$) in a sample of people diagnosed with OCD.
An Icelandic version of the III was used in this study, which has been shown to have good psychometric properties (Magnúsdóttir & Einarsdóttir, 2003).

**Quality of Life Scale (QOLS)**

The QOLS is a self-report questionnaire consisting of 16 items that assesses quality of life across five domains (e.g., relationships with other people) on a seven point Likert scale ranging from 1 (i.e., terrible) to 7 (i.e., delighted) (Liedberg, Burckhardt, & Henriksson, 2005). An Icelandic translation of the QOLS shown to have good internal reliability (Cronbach’s alpha = .89) and test-retest reliability ($r = .72$; Hrafnsson & Guðmundsson, 2007) was compared to another translation made by an advanced graduate student, and Dr. Bjornsson combined the two translations into one final version. The QOLS had fair internal consistency ($\alpha = .72$) in this study. Also, lower scores on the QOLS predicted a diagnosis of SAD on the Icelandic version of MINI.

The following four measures were translated from English to Icelandic by two advanced graduate students in psychology. Dr. Bjornsson, the primary investigator, then combined the two translations into one final version:

**The Liebowitz Social Anxiety Scale (LSAS)**

The LSAS (Heimberg et al., 1999) is a brief, semi-structured interview, that assesses anxiety and/or fear and avoidance during the last week across 24 different social situations. Each item is rated on a 0-3 point Likert scale and the total score, for anxiety and/or fear and total avoidance, is considered to be a measure of symptom severity. This interview has been found to be reliable and valid and thought to be a treatment sensitive measure in samples of outpatients with SAD (Heimberg et al., 1999). The Icelandic version used in this study had good internal consistency in the SAD group ($\alpha = .82$ to .94). Additionally, scores on the LSAS predicted a SAD diagnosis on the Icelandic version of MINI.
**Social Phobia Weekly Summary scale (SPWSS)**

The SPWSS is a weekly summary scale consisting of six items designed to measure key aspects of SAD (i.e., social anxiety, social avoidance, self-focused versus external attention, anticipatory processing, and post-event rumination). The scale has been shown to have good internal reliability (Cronbach’s alpha = .81; Clark et al., 2003). The SPWSS had fair internal consistency (α = .76) in this study.

**The Patient Health Questionnaire-9 (PHQ-9)**

PHQ-9 is a self-report questionnaire that assess symptoms of depression and their severity. The questionnaire is 9 items and each item is scored on a scale from 0 (i.e., not at all) to 3 (i.e., nearly every day). This measure has shown good internal reliability (Cronbach’s alphas from .86 to .89) and good test-retest reliability ($r = .84$; Kroenke, Spitzer, & Williams, 2001). PHQ-9 in this study had excellent internal consistency (α = .9) in this study. Scores on the Icelandic PHQ-9 predicted a diagnosis of MDD on the Icelandic version of the MINI.

**The Sheehan Disability Scale (SDS)**

The SDS is a self-report questionnaire which is designed to assess functional impairment across three domains: (1) Work/school, (2) social, and (3) family life. These domains are measured on an 11-point Likert scale which ranges from 0 (i.e., not at all) to 10 (i.e., extremely). This scale has been shown to have good psychometric properties, including good construct validity and high internal and test-retest reliability (Leon, Olfson, Portera, Farber, & Sheehan, 1997). The SDS also has a high correlation with symptoms of SAD and MDD. In this study, scores on the SDS predicted a diagnosis of SAD on the Icelandic version of the MINI, and had poor to good internal consistency in the SAD group (α = .54 to .81).

**Procedure**

We recruited participants with advertisements on the homepage of the Icelandic Center for Treatment of Anxiety Disorders, but also on Facebook and other social media.
Participants were asked to sign an informed consent form, on which they were asked for permission to have the assessment audiotaped for supervision and reliability. They were also informed on their right not to consent to the taping and to discontinue the interview at any time. We documented all the assessments on laptop computers using Redcap (www.project-redcap.org), an encrypted electronic database that is stored on secure servers. This study is approved by the National Bioethics committee of Iceland.

The assessors were advanced clinical graduate students and one psychologist that conducted all interviews (i.e., the Imagery interview, M.I.N.I., BDD-DM and LSAS). They received careful training from Dr. Bjornsson, the primary investigator. The training consisted of conducting mock interviews, observing an assessment session conducted by Dr. Bjornsson and reviewing administration manuals. The research group also held weekly consensus meetings (supervised by Dr. Bjornsson) throughout the duration of the study in which every interview was discussed (including considerations on differential diagnoses and on how participants appraised the intrusive images) until a consensus was reached. Assessors also received supervision on the administration of the clinical interviews during these meetings.

Content analyses were also conducted in the aforementioned consensus meetings, to identify the main themes of the recurrent intrusive images and the themes in how they were appraised. These analyses were conducted by the primary investigator and two graduate students. Adopting a methodology based on Joffe and Yardley (2004, see also Lipton et al., 2010; Purdon & Holdaway, 2010), we created separate themes for the content and appraisal of the images by investigating the existing literature on intrusive images in SAD and their manifestation in cognitive models of the disorder (see, Clark & Wells, 1995; Hackmann et al., 2000; Heimberg et al., 2010; Hofmann, 2007; Moscovitch, 2009).

First, the main themes of the intrusive images identified by members were: I. Bullying (e.g., one or more person/s intentionally and repeatedly physically and/or mentally harming
the participant; Olweus, 1993); II. Physical and/or sexual abuse (e.g., rape); III. Perceived traumatic remarks (e.g., someone innocently pointing out visible anxiety symptoms); IV. Being rejected and/or not included (e.g., a breakup); V. Social perfectionism (e.g., having very high standards of performance in a social situation); VI. Social mishap and/or public humiliation (e.g., making a mistake during a live performance). After themes were established, each member then examined the data and tried to fit each image into one of these six categories. Subsequently, a consensus meeting was held where this categorization was discussed and it was clear that some categories had to be modified to match the responses of participants. The following changes were made: II. Physical and/or sexual abuse was not identified in the images. However, some participants experienced images of mental abuse from family members and this category was thus modified accordingly; III. The category “perceived traumatic remarks” was removed due to not applying to the data; V. Social perfectionism was also removed due to not fitting the data; VI. The category “social mishap and/or public humiliation” was modified to include only social mishaps because there was seldom a clear indication of public humiliation involved in the social mishaps reported. Additionally, two new categories were derived: “Feeling like an outsider” and “Displaying visible anxiety symptoms in social situations”. Members then, once again, individually categorized the intrusive images in accordance with the new categories and each item was then discussed during consensus meetings. In the case of discrepancy, the item was discussed further until consensus was reached or, if not, the item was rated as not codeable. The final version of the categories derived from the intrusive images were: I. Bullying; II. Mental abuse; III. Feeling rejected and/or not included; IV. Social mishap; V. Feeling like an outsider; VI. Displaying visible anxiety symptoms.

Second, participants’ appraisals of images were categorized applying the same content analysis procedure that was used with the images. The original categories derived were: I.
Flawed and/or weak self (e.g., “I’m boring” or “I’m not strong enough to cope in demanding social situations”); II. Others are critical/and or cruel (e.g., “others are jerks and I don’t trust them”); III. Social perfectionism (e.g., “it is disastrous to make mistakes in social interactions”); IV. Not capable (e.g., “I lack the necessary social skills to function in social situations”); V. Dangerous world (e.g., “the world is not safe”). After the participants’ responses were examined, the categories were modified in accordance with the data, and the final categories were: I. Flawed self; II. Weak self; III. Social perfectionism; IV. Being an outsider (e.g., “I’m not like other people”); V. Others are critical and/or cruel; VI. Dangerous world. Members decided to separate the category “Flawed/weak self” into two distinct categories due to the frequency of these two types of appraisals and the subtle difference between them (e.g., “I’m uninteresting” versus “I’m too weak of a person to cope with social interactions”). Additionally, the category “I’m not capable” was removed because it did not apply to the data and the category “Being an outsider” was added instead.

Statistical analyses

Descriptive statistics for demographical and clinical variables were used by comparing frequencies, percentages, means and standard deviations. Also, independent two-sided T-tests ($\alpha = .05$) were conducted to compare the SAD group in this study to an OCD sample and an anxiety disorders sample from Lipton et al (2010). All variables of interest were screened for deviations from normality and univariate outliers.

Results

Frequency, characteristic and content of clinically significant intrusive images

More than half of the participants (60.0%, $n = 21$) reported having at least one recurrent intrusive image during the last 6 months. The image was experienced 2.8 times on average during a typical week over that time period ($SD = 2.1$, range: 0.2-7.5), and 2.0 times on average during the week prior to assessment ($SD = 2.3$, range: 0-10). Participants also
reported the image lasting around 30 seconds on average ($M = 31.6$, $SD = 30.8$, range: 2-90), with 76.2% reporting that bringing the image to mind required little or no effort, and 52.4% of participants reporting that the image was either intense or very intense.

Interestingly, not a single participant reported observing their intrusive image from a pure observer perspective. Nearly half (47.6%) of them experienced their image from a field perspective. The remainder (52.4%) reported alternating between a field and an observer perspective, in which the image was seen, on average, 62.3% from a field perspective and 37.3% from an observer perspective.

The most commonly reported sensory modality was sight (95.2%), followed by bodily sensations (71.4%), sound (42.9%), smell (9.5%), and then taste and touch (4.8% each). Sight was the primary sensory modality for the greatest number of participants (71.4%), while bodily sensations were also a relatively common primary sensory modality (for 19.0%). Most participants (76.2%) experienced the image like a video clip, while others experienced it as detached pictures (9.5%), a still frame (4.8%) or in other ways (9.5%).

The most commonly reported emotions patients noted when experiencing the image were anxiety, shame, sadness, and disgust towards self (see Table 2). Furthermore, anxiety (38.0%; $M$ intensity = 7.5, $SD = 2.6$) and shame (19.0%; $M$ intensity = 7.0, $SD = 2.8$) were the most frequently reported primary emotions.
Table 2. Frequencies and intensity of emotions in response to the image among participants \((n = 21)\).

<table>
<thead>
<tr>
<th>Emotions(^a)</th>
<th>(n) (%)</th>
<th>(M) (SD)(^b)</th>
<th>Primary emotion (n) (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sadness</td>
<td>15 (71.4%)</td>
<td>4.1 (3.3)</td>
<td>1 (4.8%)</td>
</tr>
<tr>
<td>Guilt</td>
<td>10 (47.6%)</td>
<td>3.5 (3.9)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Shame</td>
<td>19 (90.5%)</td>
<td>7.0 (2.8)</td>
<td>4 (19%)</td>
</tr>
<tr>
<td>Disgust towards self</td>
<td>14 (66.6%)</td>
<td>4.4 (3.5)</td>
<td>1 (4.8%)</td>
</tr>
<tr>
<td>Disgust towards others</td>
<td>12 (57.1%)</td>
<td>3.1 (3.7)</td>
<td>2 (9.5%)</td>
</tr>
<tr>
<td>Anger</td>
<td>12 (57.1%)</td>
<td>4.0 (4.0)</td>
<td>2 (9.5%)</td>
</tr>
<tr>
<td>Anxiety</td>
<td>20 (95.2%)</td>
<td>7.5 (2.6)</td>
<td>8 (38.0%)</td>
</tr>
<tr>
<td>Fear</td>
<td>17 (80.1%)</td>
<td>5.8 (3.5)</td>
<td>2 (9.5%)</td>
</tr>
</tbody>
</table>

\(^a\)Emotions are not mutually exclusive. \(^b\)Mean (standard deviation).

Almost half of participants (42.9%) reported that the intrusive image had caused them significant or severe distress. Most patients (90.0%) also believed that the image in addition to all the strategies they used in response to the image had negatively impacted their lives and impaired their functioning during the last 6 months, and more than half (57.1%) reported that the image had significantly, severely or extremely impacted on their lives. Additionally, most participants (85.7%) felt, at least partly, as if their image was really taking place when they experienced it. Most participants (66.6%) believed that their image was based on a memory of a socially traumatic event that had happened to them.

The content analyses of images revealed that one third of participants (33.3%) experienced an intrusive image that was categorized as a “social mishap” and 19% had images which belonged to the category “feeling like an outsider” (see examples of items belonging to each category in Table 3). Frequencies of other categories were: “Displaying visible anxiety symptoms (14.3%)”, “Feeling rejected and/or not included (14.3%)”, “Bullying” (9.5%) and “Mental abuse” (9.5%).
Table 3. Content analyses of the intrusive images experienced by participants (n =21)

<table>
<thead>
<tr>
<th>Theme</th>
<th>n (%)</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Bullying</td>
<td>2 (9.5%)</td>
<td>“I see the boys in class laughing at me and calling me names”</td>
</tr>
<tr>
<td>II. Mental abuse</td>
<td>2 (9.5%)</td>
<td>“I see my father towering above me, asking me in a low but threatening voice if he should reveal what I’m really like to other people”</td>
</tr>
<tr>
<td>III. Feeling rejected/not included</td>
<td>3 (14.3%)</td>
<td>“I try to talk to the people at the table but they ignore me”</td>
</tr>
<tr>
<td>IV. Social mishap</td>
<td>7 (33.3%)</td>
<td>“I accidentally said the name of the person I was going to vote for instead of my own name when registering to vote”</td>
</tr>
<tr>
<td>V. Feeling like an outsider</td>
<td>4 (19%)</td>
<td>“I see myself on the dancefloor. I feel different from others. Everybody’s having fun but me”</td>
</tr>
<tr>
<td>VI. Displaying visible anxiety symptoms</td>
<td>3 (14.3%)</td>
<td>“I’m trying to introduce myself but begin to tremble. My heart starts racing and I feel cold sweat. I want to run away before anybody notices”</td>
</tr>
</tbody>
</table>

Beliefs and appraisals related to the intrusive images

When scores on the III were compared to an OCD sample in Lipton et al. (2010), the SAD group in this study only received significantly lower scores on the subscale “Responsibility” (see Table 4). The SAD group in the present study did not differ significantly from anxiety controls in that study.
Table 4. Comparison of total and subscale scores on the Interpretations of Intrusions Inventory (III) between the SAD group in the present study ($n = 21$) and the OCD group ($n = 21$) and Anxiety control group ($n = 22$) in Lipton et al., (2010).

<table>
<thead>
<tr>
<th></th>
<th>SAD group ($n = 21$)</th>
<th>OCD group ($n = 21$)</th>
<th>Anxiety controls ($n = 22$)</th>
<th>SAD vs OCD</th>
<th>SAD vs Anxiety controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>III-total score$^d$</td>
<td>1241.6 (508.8)</td>
<td>1607.9 (690.4)</td>
<td>1341.2 (704.8)</td>
<td>2.0</td>
<td>1.15</td>
</tr>
<tr>
<td>Responsibility</td>
<td>367.9 (182.0)</td>
<td>585.3 (245.3)</td>
<td>415.9 (271.0)</td>
<td>3.3*</td>
<td>1.97</td>
</tr>
<tr>
<td>Importance of thought</td>
<td>342.6 (172.0)</td>
<td>412.6 (246.0)</td>
<td>336.5 (232.5)</td>
<td>1.1</td>
<td>0.95</td>
</tr>
<tr>
<td>Control of thought</td>
<td>531.1 (224.7)</td>
<td>610.0 (253.0)</td>
<td>588.8 (252.0)</td>
<td>1.1</td>
<td>0.25</td>
</tr>
</tbody>
</table>

$^a$Mean (standard deviation). $^b$Social anxiety disorder. $^c$Obsessive-compulsive disorder. $^d$Interpretation of intrusions inventory. * $p < .05$.

Content analyses of appraisals in the present study revealed that nearly all participants reported negative appraisals about the self (90.5%). Almost half (42.8%) concluded that the image meant that they were flawed in some way, while others considered themselves weak (28.6%), different from others (14.3%) or that they must perform perfectly in social situations (4.8%). Only one third (33.3%) of participants reported negative appraisals about others or the world, with the majority of those participants perceiving others as critical and/or cruel (23.8%) and the rest that the world is dangerous (9.5%; see Table 5). Almost all participants believed their appraisal statements to be at least somewhat true (95.2%) with roughly two thirds (71.4%) believing these statements mostly or completely.
Table 5. Content analyses of the appraisals of intrusive images (n = 21).

<table>
<thead>
<tr>
<th>Theme</th>
<th>n(%)</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Flawed/weak self</td>
<td>9 (42.9%)</td>
<td>“I’m inferior”</td>
</tr>
<tr>
<td>II. Weak self</td>
<td>6 (28.6%)</td>
<td>“I’m not strong enough”</td>
</tr>
<tr>
<td>III. Social perfectionism</td>
<td>1 (4.8%)</td>
<td>“I must never show my flaws”</td>
</tr>
<tr>
<td>IV. Being and outsider</td>
<td>3 (14.3%)</td>
<td>“I’m not like other people”</td>
</tr>
<tr>
<td>V. Others are critical and/or cruel</td>
<td>5 (23.8%)</td>
<td>“People can’t be trusted”</td>
</tr>
<tr>
<td>VI. Dangerous world</td>
<td>2 (9.5%)</td>
<td>“This world is too risky for me”</td>
</tr>
</tbody>
</table>

Some participants (n = 5, 23.8%) reported appraisals of their recurrent intrusive imagery which belonged to two categories. The appraisals are, therefore, not mutually exclusive.

Participants were also asked about various meta-cognitive beliefs regarding the image. Many participants (57.1%) mostly or completely believed that their image was a premonition of something, and only around one in five (19.0%) did not believe it was a premonition at all. Moreover, almost half (47.6%) of the participants thought something bad would happen if they would voluntarily allow the image to into their mind (e.g., that their anxiety would spiral out of control).

Discussion

In this study, we explored the characteristics of intrusive images reported by outpatients with a primary diagnosis of SAD. In particular, we focused on the way these patients appraised the image. First, our main goal was to explore whether cognitive behavioral models of OCD are sufficient to account for appraisal processes of intrusive images in SAD. In particular, we explored whether patients with SAD endorse the three types of beliefs which have been thought to be specific to OCD (responsibility, importance of thoughts and control of thoughts). Second, we wanted to investigate whether there were appraisals which could be considered specific to SAD, by performing content analyses of the images and how these images were appraised by these patients. Third, we sought to replicate, and add to, existing studies on the characteristics of images in SAD (see in particular Hackmann et al., 2000;
Sixty percent of patients in this study reported a recurrent, clinically significant intrusive image in the past six months. These results do not align completely with previous studies on SAD patients, in which most, if not all, patients have reported images (Hackmann et al., 2000). Similarly, fewer patients (66.6%) reported that the image was based on a memory than previously reported (Hackmann et al., 2000; Moscovitch et al., 2011). However, we only assessed clinically significant images that were intrusive and recurrent in the past 6 months, which could, at least in part, explain this discrepancy. The major question, however, is what is maintaining these recurrent intrusive cognitions over time? The most obvious answer is that there are similar appraisal processes of intrusive cognitions at play in SAD that are known to play a key role in the development of obsessions and compulsions in OCD.

Patients also reported that the images were expressed in various sensory modalities with sight being the most common (95.2%), followed by bodily sensations (71.4%) and then sounds (42.9%). These findings seem to be within the range of previous findings across disorders, which has documented similar modality frequencies, with sight and bodily sensations commonly being the most frequently reported (e.g., Day et al., 2004; Hackmann et al., 2000; Speckens et al., 2007).

The general consensus in the SAD literature is that patients perceive images from an observer perspective (e.g., Hackmann et al., 2000; Wells, Clark, & Ahmad; 1998; Wells & Papageorgiou, 1999), and that this perspective is often associated with situations involving increased self-awareness (Nigro and Neisser, 1983). It is common in disorders such as body dysmorphic disorder (BDD), in which the focus is on the self, and on being negatively evaluated in social situations (Osman et al., 2004). This perspective is part of cognitive models of SAD (e.g., Clark & Wells, 1995), in which images are thought to be an important
maintaining factor of the disorder. In contrast, images in OCD and most other disorders have more commonly been associated with a field perspective (Coles, Turk, Heimberg, & Fresco, 2001; Lipton et al., 2010; Speckens et al., 2007). We found that no patient reported a pure observer perspective, and that nearly half (47.6%) of patients reported a field perspective, while the other half (52.4%) reported an alternating perspective between the two in which the field perspective was more dominant (62.3%) on average. These findings are similar to imagery perspective in patients with OCD, who predominantly observe images from a field perspective (Lipton et al., 2010; Speckens et al., 2007). We propose that image perspective may be more similar across disorders than previously thought, which, if replicated, raises important questions about the portrayal of images in current theoretical models of SAD.

Content analyses of the images revealed six distinct categories: I. Bullying; II. Mental abuse; III. Feeling rejected/not included; IV. Social mishap; V. Feeling like an outsider; VI. Displaying visible anxiety symptoms. Patients most commonly reported intrusive images pertaining to making a variety of social mistakes (category IV) suggesting that SAD patients find those type of experiences especially upsetting. These categories are similar to those derived in Hackmann et al. (2000), although categories I, II and IV were not represented in that study. Categories III to VI are likely representative of core fears in SAD (i.e., they represent what the individual fears may happen in a social situation), while categories I and II may relate to socially traumatic events experienced by the individual.

Are there similar appraisal processes of intrusive cognitions at work in SAD, as there are in OCD? We found evidence, as have other studies (e.g., Lipton et al., 2010), that individuals with SAD as a primary diagnosis scored highly on subscales capturing beliefs (responsibility, over-importance of thoughts and thought control) that have been hypothesized to be specific to the development and maintenance of OCD (OCCG, 2003). Similar to Lipton et al. (2010), SAD patients attached less responsibility to images compared to OCD patients,
although they did endorse such statements to a considerable degree. However, we found no
evidence that SAD patients differed from OCD patients with regard to beliefs on the
importance of the image and of thought control. In other words, these fundamental beliefs are
not specific to OCD, and there are likely similar appraisal processes at work in the
development and maintenance of SAD, as there are in OCD.

However, could there be some appraisal processes that are specific to SAD? All SAD
patients appraised the intrusive image as having a negative meaning about themselves, other
people, or the world. The content analyses of appraisals revealed the following categories: I.
Flawed self; 2. Weak self; III. Social perfectionism; IV. Being an outsider; V. Others are
critical and/or cruel; VI. The world is dangerous. Patients more commonly adopted negative
appraisals about the self (90%) compared to negative appraisals about the world or others
(33.3%). According to Moscovitch (2009), the core fear in SAD is a fear of revealing self-
attributes that the patient regards as being deficient or conflicting with societal expectations or
norms. Most SAD patients in this study did, in fact, appraise their image as revealing that they
were somehow flawed, weak or abnormal. In summary, these findings reveal evidence for
potentially specific appraisal process in SAD, although further studies on appraisal processes
in other anxiety disorders and disorders such as BDD are needed to evaluate this claim. In
future studies, it may be important to develop measures of appraisals of intrusive images (and
other types of intrusive cognitions) in SAD, which might consist of a mixture of SAD specific
and more generic beliefs that are common with SAD, OCD, and other disorders that are
characterized by intrusive cognitions.

Images are thought to contribute to the persistence of the disorder in cognitive models
of SAD (e.g., Clark & Wells, 1995), in part by eliciting anxiety in social situations. Very little
theoretical work and empirical research, however, has gone into assessing how patients
appraise and react to intrusive images and possibly other types of intrusive cognitions in SAD.
We believe that much can be learned from cognitive models of OCD in that regard, and future research should be aimed at evaluating similarities and differences in appraisal processes of intrusive images (and other types of intrusive cognitions) in SAD, and in other disorders not usually associated with OCD. The finding in this study indicate that appraisals of unwanted intrusive images may associated with compulsive strategies (which were found to be common in the present study), and that obsessions and compulsions may be a maintaining process in SAD. If these findings are replicated, these findings have important implications for current theoretical models of the disorder.

**Study limitations**

Sample size was relatively small in this study, limiting the general conclusions that can be drawn from the findings. Additionally, patients were asked retrospectively about the intrusive image, which may have introduced well-known biases in memory. We tried to limit these biases by asking participants to evoke and describe their most intrusive image during the interview. It is important to replicate this study and add an OCD comparison group to assess potential similarities between the two clinical groups. We are, indeed, working on such a replication study.

**Treatment implications**

This study, if replicated, may have important clinical implications. Our findings highlight the importance of carefully assessing intrusive images in SAD. More importantly, the results of the two studies stemming from this research project (Þorvaldsson, 2015) suggest that successful approaches in the treatment of OCD could possibly increase treatment efficacy in SAD. In the previous study (Þorvaldsson, 2015), many of the strategies patients used in response to intrusive image could be classified as compulsive which suggest that adding exposure and response prevention to CBT for SAD to target compulsions (Bjornsson & Phillips, 2014) could potentially increase the effectiveness of the treatment.
References


