



Contents lists available at ScienceDirect

# Journal of Behavior Therapy and Experimental Psychiatry

journal homepage: [www.elsevier.com/locate/jbtep](http://www.elsevier.com/locate/jbtep)



## Measuring online interpretations and attributions of social situations: Links with adolescent social anxiety



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### ARTICLE INFO

#### Article history:

Received 29 April 2015

Received in revised form

1 September 2015

Accepted 18 September 2015

Available online 22 October 2015

#### Keywords:

Cognitive bias

Interpretation

Attribution

Social anxiety

Development

Adolescence

### ABSTRACT

**Objective:** We evaluated the utility of a novel, picture-based tool to measure how adolescents interpret and attribute cause to social exchanges and whether biases in these processes relate to social anxiety. Briefly presented ambiguous visual social scenes, each containing a photograph of the adolescent as the protagonist, were followed by three possible interpretations (positive, negative, neutral/unrelated) and two possible causal attributions (internal, external) to which participants responded.

**Method:** Ninety-five adolescents aged 14 to 17 recruited from mainstream schools, with varying levels of social anxiety rated the likelihood of positive, negative and unrelated interpretations before selecting the single interpretation they deemed as most likely. This was followed by a question prompting them to decide between an internal or external causal attribution for the interpreted event.

**Results:** Across scenarios, adolescents with higher levels of social anxiety rated negative interpretations as more likely and positive interpretations as less likely compared to lower socially anxious adolescents. Higher socially anxious adolescents were also more likely to select internal attributions to negative and less likely to select internal attributions for positive events than adolescents with lower levels of social anxiety.

**Conclusions:** Adolescents with higher social anxiety display cognitive biases in interpretation and attribution. This tool is suitable for measuring cognitive biases of complex visual-social cues in youth populations with social anxiety and simulates the demands of daily social experiences more closely.

**Limitations:** As we did not measure depressive symptoms, we cannot be sure that biases linked to social anxiety are not due to concurrent low mood.

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### 1. Introduction

Anxiety disorders are common in adolescence (Kessler, Stang, Wittchen, Stein, & Walters, 1999). Since adolescence is generally associated with increased salience of social cues, heightened self-consciousness and increasing importance of peer relationships, it is not surprising that social anxiety disorder (SAD) is one of the most common and disabling anxiety conditions in youth – persisting to explain a significant proportion of adult SAD (Kessler et al., 1999; Wittchen, Stein, & Kessler, 1999). SAD is marked by a persistent and disabling fear of social interactions, specifically a fear

of negative evaluations by others (Clark & Wells, 1995; Foa, Franklin, Perry, & Herbert, 1996). Consequentially, individuals with SAD often avoid social situations or approach them with maladaptive social behavior, thereby maintaining and reinforcing their fears (Clark & Wells, 1995; Rapee & Heimberg, 1997). Understanding how adolescents with social anxiety process information in anticipation of and during social exchanges is therefore crucial for understanding how symptoms arise and for interventive purposes, how they abate.

Cognitive biases represent a key factor in the maintenance of social anxiety by introducing systematic distortions in the processing of social cues, thereby increasing the salience of socially threatening information in the environment (Clark & Wells, 1995; Muris & Field, 2008; Ollendick & Hirshfeld-Becker, 2002; Rapee & Heimberg, 1997). As social interactions often involve dynamic and subtle, indirect or limited cues to mental states, the decoding of

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ambiguity is central to the computational challenges of social inference making. Hence, biases that operate at the stage of disambiguating social signals may be particularly pertinent to social anxiety.

The misinterpretation of social cues has been shown to differentiate adult clinical/subclinical socially anxious populations from low socially anxious populations. Both increased negative interpretations and a lack of positive interpretations have been suggested to characterize adults with social anxiety (Amir, Foa, & Coles, 1998; Amir, Prouvost, & Kuckertz, 2012; Constans, Penn, Ihen, & Hope, 1999; Stopa & Clark, 2000). Socially anxious individuals are also thought to exhibit an attributional bias, that is, an increased tendency to adopt personal responsibility (i.e. an internal cause) for negative compared to positive events such as failures and successes at a task (Arkin, Appelman, & Burger, 1980; Heimberg et al., 1989). Consistent with adult research that suggests that several different biases influence social anxiety and interact to maintain anxiety dysfunction (Hirsch, Clark, & Mathews, 2006), the present study will provide data on a novel measure that assesses both interpretational and attributional biases in relation to adolescent social anxiety levels.

### 1.1. Studies of interpretation bias and social anxiety

Most adult studies of interpretation bias have relied on vignette-based stimuli and participants' ability to evoke a mental image of the described situation. While these data find results in support of the link between distorted interpretations and social anxiety, little is known about the ecological validity of this type of assessment. Further, many of the central but also more subtle social cues that play an important role in social interactions are visual in nature. These include facial and bodily gestures, which are a central source of another's thoughts and feelings, convey signals of threat or affiliation, and communication of intent. Interpersonal attitudes and action prediction are often conveyed by expression, gaze direction and body posture. While there are a number of studies on visual cue interpretation using face stimuli of different intensity or morphed facial expressions, findings are mixed and less clear than those emerging from questionnaire vignettes. Some studies report that high socially anxious or individuals with SAD are more likely to evaluate or mistake facial expressions as threatening (Dimberg, 1997; Dimberg, Frederikson, & Lundquist, 1986; Heuer, Lange, Isaac, Rinck, & Becker, 2010; Pozo, Carver, Wellens, & Scheier, 1991; Vassilopoulos, 2011; Winton, Clark, & Edelman, 1995), whilst others report no differences in ratings or detection rates (Clark, Siddle, & Bond, 1992; Merckelbach, van Hout, van den Hout, & Mersch, 1989; Jusyte & Schoenberg, 2013; Schofield, Coles, & Gibb, 2007). With so few studies, it is difficult to ascertain why some studies report significant findings and others do not. Inconsistencies in findings could relate to methodological differences such as task demands, nature and length of stimuli presented and/or sample characteristics.

Of those studies that have employed younger, non-adult samples to investigate the link between social anxiety and interpretational biases, only one has specifically focused on adolescents. Using a questionnaire-based measure consisting of five social and five non-social ambiguous scenarios, Miers and colleagues (Miers, Blöte, Bögels, & Westenberg, 2008) reported that socially anxious adolescents rated negative interpretations of social scenarios as significantly more likely than low socially anxious adolescents, with no social anxiety related difference in the ratings of positive interpretations and interpretations to non-social scenarios (after controlling for negative affect). Using visual cues to assess interpretation of ambiguous social cues in relation to social anxiety, a few studies have used samples that span childhood and

adolescence. A study by Simonian, Beidel, Turner, Berkes, and Long (2001) reported poorer facial affect recognition skills in children and adolescents with social phobia, while Melfsen and Florin (2002) did not find differences in the ability to decode facial expressions nor response biases towards negative facial expressions in their socially anxious group; however, they found that participants with social phobia were more likely to interpret neutral faces as emotional (both positive and negative). Both studies used close-up, detailed face stimuli rather than contextually embedded complex cues. Interpretation biases may become more apparent with more ecologically valid visual social stimuli, which contain a range of ambiguous overt and more subtle peer-related cues embedded in a social scene to mirror those captured in vignette-based measures.

### 1.2. Studies of attributional bias and social anxiety

Drawing on early models of learned helplessness (Abramson, Metalsky, & Alloy, 1989), there is a wealth of literature on maladaptive causal attributions as part of the cognitive style of depressed youths (e.g., Gladstone & Kaslow, 1995). Far less empirical data links negative attributional styles to social anxiety in developmental populations, despite there being strong theoretical reasons (mainly from longstanding adult work) for expecting such an association (Bell-Dolan & Wessler, 1994). According to this body of work, high levels of self-focused attention of socially-anxious individuals in social situations predisposes them to make more internal causal attributions of the outcomes of these social events. As socially-anxious individuals may be more likely to elicit negative responses from others and to expect and remember negative interactions, the tendency to attribute social event outcomes to the self occurs more frequently for actual or perceived social failures (see Hope, Gansler, & Heimberg, 1989). While ample data supports these predictions, studies have also found that adults with high levels of social concern present the opposite pattern of attributions for positive social outcomes. For example, they might be less likely to take responsibility (Hope et al., 1989) – although the theoretical rationale for this is less clear.

There have been some studies of attributional style in anxiety in youth (see Bell-Dolan & Wessler, 1994), but none that focus on social anxiety in particular. However, as causal attributions sometimes appear in experimenter-provided responses within measures of interpretation biases (e.g. “*They don't want me on their team because I'm boring.*” – where the first part of this response reflects an interpretation and the second part a causal attribution) these have been measured indirectly in developmental studies of interpretation biases in social anxiety. These data would therefore suggest that there is an association between social anxiety symptoms in adolescents and a negative attributional bias. However, confounding interpretation-attribution dimensions may have artificially inflated/deflated the association between social anxiety and interpretation of social ambiguity. Measuring biases separately will allow a more nuanced understanding in how strongly each is associated with social anxiety and for clinical purposes, which one to primarily target. In order to map out the cognitive profile of socially anxious adolescents, it is important to understand whether a negative attributional style also characterizes adolescents with social worries.

### 1.3. The current study

To our knowledge there is just one study of interpretation bias and social anxiety in adolescents – and none that measure attributional biases specifically. It may be that cognitive biases in social situations are more readily probed by presenting participants with

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