Specificity of the Jumping-to-Conclusion Bias in Social Anxiety: An Account using the Bayesian Computational Modelling Approach

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Abstract

To date, little is known about the role of social anxiety in the assignment of evidence weights which could contribute to the jumping-to-conclusion bias. The present study used a Bayesian computational method to understand the mechanism of jumping-to-conclusion bias in social anxiety, specifically through the assignment of weights to information sampled. The present study also investigated the specificity of the jumping-to-conclusion bias in social anxiety using three variations of beads tasks that consisted of neutral and socially threatening situations. A sample of 210 participants was recruited from online communities to complete the beads tasks and a set of questionnaires measuring the trait variables including social anxiety and the fears of positive and negative evaluation. The Bayesian model estimations indicated that social anxiety and fears of evaluation significantly biased the assignment of evidence weights to information received in certain conditions of the beads tasks. Our results indicated that social anxiety and fear of evaluation could influence belief updating depending on situations. However, the influences from these trait variables seemed to be insufficient in contributing to the jumping-to-conclusion bias.

Keywords: belief updating; jumping to conclusion bias; beads tasks; Bayesian computational modelling; reasoning bias; social anxiety; fears of evaluation

Introduction

Biases in information processing are common in psychopathologies including psychosis, anxiety disorders, and depression (Beck & Clark, 1997; Garety et al., 2011; Leppänen, 2006). In recent years, there is an increasing interest in establishing a type of reasoning bias, the Jumping-to-Conclusion bias (JTC), as a transdiagnostic factor underlying mental disorders. The JTC bias refers to the tendency to make hasty decisions (Garety et al., 1991). Whilst the JTC bias is prevalently studied in the context of delusions, some studies have also found that clinically anxious populations exhibit the JTC bias (Bensi & Giusberti, 2007; Giusti et al., 2018; Lincoln et al., 2010). However, several meta-analyses have suggested that the relationships between the JTC bias and delusions as well as anxiety are inconclusive given the heterogeneity in effect sizes (Dudley et al., 2016; Ross et al., 2015; So et al., 2016).

The classic beads task is the gold standard for measuring the JTC bias (Huq et al., 1988). In this task, participants are shown two jars with opposing ratios of beads. Participants are told that one of the jars is randomly chosen and beads are drawn out of the chosen jar (Huq et al., 1988). Participants can request to see as many beads as they wish before deciding the source of beads being drawn. Unbeknownst to participants, the sequence of beads is predetermined. Individuals who reach a decision with fewer than two beads are typically considered jumping to conclusions (Garety et al., 1991; Huq et al., 1988). Although viewing a neutral stimulus such as a bead could result in an extreme responding style in individuals with delusions, the same may not be true for individuals with high anxiety levels. Cognitive models of anxiety postulate that biases in anxiety are only triggered in the presence of a perceived threat that is congruent with the anxiety subtype (Beck & Clark, 1997; Heinrichs & Hofmann, 2001; Rapee & Heimberg, 1997). Thus, individuals with high levels of anxiety may not exhibit the JTC bias when the classic beads task is used to assess this reasoning bias since the task does not involve threat cues.

Schlier et al. (2016) explored the specificity of the JTC bias amongst individuals with social anxiety disorder. They compared the decisional aspects between the classic beads task which involves viewing beads and the social beads task which contains social information about neutral and social situations involving self-relevant and delusion-relevant threats (Westermann et al., 2012). The clinical and healthy samples behaved similarly in the social beads task, but individuals with social anxiety disorder requested significantly more beads than the healthy controls in the classic beads task (Schlier et al., 2016). Whilst this may suggest that social anxiety is not associated with the JTC bias, it is arguable that the social situations presented may not necessarily tap into the cognitive biases in social anxiety. For example, the self-relevant scenarios have specified the outcome of the scenario, such as by asking "Which waitress made a critical comment about you?" or "Which group is bored by your talk?". In these cases, the individuals only need to collect information to determine the source of critical comment, rather than using the

information to interpret whether the scenario is threatening or not. Furthermore, the self-relevant social beads task did not consistently yield acceptable convergent validity with the classic beads task across different levels of this content class (Westermann et al., 2012). Thus, this suggests that the social beads task may not be a sufficient paradigm to capture the JTC bias in social anxiety and may not be comparable to the classic beads task.

Cognitive models of delusion and anxiety have emphasised threat-processing biases, such that individuals with higher levels of delusion ideation and anxiety are prone to using more threat-congruent or belief-confirming information to update their beliefs compared to non-threatening and contradictory information (Bell et al., 2006; Müller-Pinzler et al., 2019; Speechley et al., 2012). Research has also shown that individuals with social anxiety disorder do not exhibit a tendency to interpret information in a positive light, and thus lack positivity bias compared to healthy controls (Chen et al., 2020; Koban et al., 2017). Following this notion, individuals with higher levels of delusion and anxiety may assign more weight to some types of information than others. A biased assignment of evidence weights could promote a higher rate of belief updating within minimal pieces of information, thereby contributing to the JTC bias. This speculation remains to be tested in the context of anxiety, especially social anxiety.

Recent research has also shown that individuals with higher social anxiety experience not only higher fears of negative evaluation but also positive evaluation (Button et al., 2015; Fredrick & Luebbe, 2020; Weeks & Howell, 2012). Social anxiety is associated with a feeling of apprehension about being evaluated both unfavourably and favourably in social situations due to the tendency to overestimate the probability and stake of social threats and the fear of increasing expectations from others following a good performance (Dryman & Heimberg, 2015; Weeks & Howell, 2012). Studies have found that the fears of evaluation are associated with a perception that social events and outcomes are threatening and negative regardless of the valence of feedback received, although these findings are yet to be consistent (Alden et al., 2008; Button et al., 2015; Dryman & Heimberg, 2015). Considering that fears of evaluation are key cognitive features of social anxiety, the fears of evaluation could be an underlying factor explaining the relationship between social anxiety and the JTC bias, given that they are self-defeating beliefs associated with catastrophic social outcomes (Heinrichs & Hofmann, 2001). Thus, due to the higher fears of evaluation, individuals with higher social anxiety could assign heavier weights to social information in favour of negative social outcomes, regardless of whether the information is positive or negative (Alden et al., 2008). To the best knowledge, the role of fears of evaluation has not been investigated in the context of JTC bias in social anxiety.

Given the existing gaps, the present study aims to introduce two variations of the beads task to investigate the relationship between social anxiety, fears of evaluation, and the JTC bias. One variation involves viewing verbal feedback ("good" and "bad") about one's performance for a hypothetical presentation. The binary social outcomes in this task are either the individual has done a good presentation (positive social outcome) or a poor presentation (negative social outcome). This theme is consistent with the core of social anxiety as it concerns the positive and negative evaluations from the audience (Chen et al., 2020; Heinrichs & Hofmann, 2001; Rapee & Heimberg, 1997). Another variation was designed to assess the JTC bias in a social neutral situation, whereby individuals were required to decide which club in a hypothetical college had been chosen to host an event based on a sequence of gender information presented. This scenario involves social elements but is void of any social threats. These variations retained all original characteristics of the classic beads tasks for better comparisons.

The Bayesian Model

The present study is the first study to apply the Bayesian computational model developed by Tan et al. (2022) to understand the mechanism underlying the JTC bias in specific situations. This investigation focuses on the role of a trait variable in influencing the assignment of evidence weights as a factor that could contribute to the JTC bias. The model uses the variables measured in the beads tasks including the number of draws to decisions, trial-to-trial certainty about the source of information presented, and the final decision about the source of information to estimate the influence of a psychopathological trait on the assignment of evidence weights to the binary information sampled (see Figure 1). This model also assumes that the Bayesian belief updating is the normative belief updating, similar to early studies that investigated reasoning styles in clinical populations (Garety et al., 1991; Huq et al., 1988).

In this model, the most frequently occurring information from the selected jar is termed *dominant information* whereas the least frequently occurring information from the selected jar is termed *secondary information*. The dominant and secondary information is allowed to have its individual evidence weights, W_D and W_S, which are determined by the individual's trait variable. The parameters ba_D and ba_S are of interest as these parameters capture the effect of the individual's trait level on the assignment of evidence weights. The evidence weights assigned to the information sampled influence the rate of belief updating. This is reflected in *k*th individual's reported subjective certainty about the source of information on a trial-to-trial basis. The Bayesian model assumes that the prior belief follows a beta distribution with an uninformative prior.

Once the individual's evidence accumulated for a particular hypothesis exceeds the set threshold of log of Bayes factor 3, the model assumes that the individual would stop sampling. This means that the individual is now able to reach a decision about the source of information drawn.

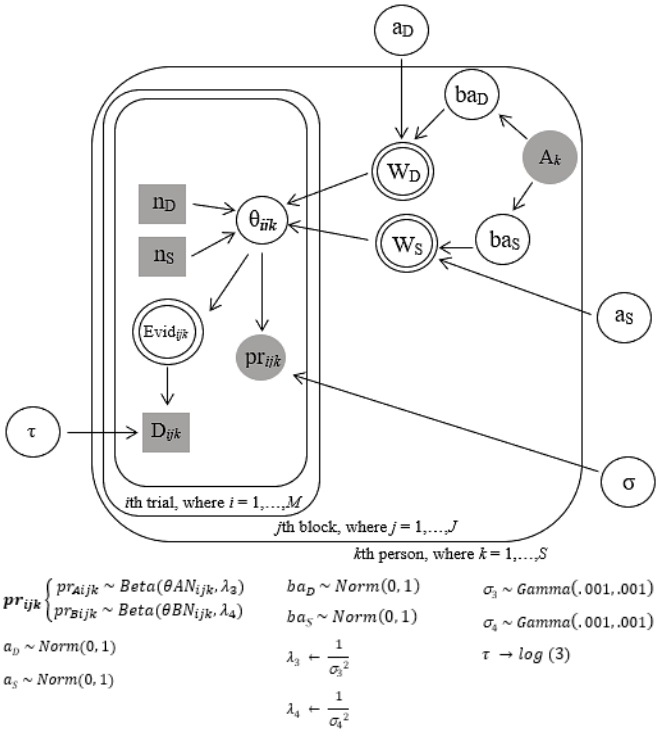

Figure 1: A graphical representation of the model.

Note. The shaded nodes represent observable variables, and the unshaded nodes represent unobservable variables. Square nodes represent discrete variables and round nodes represent continuous variables. The double-edged nodes are deterministic nodes, and the single-edged nodes are stochastic variables.

Hypotheses

The present study is the first study to systematically investigate the mechanism of JTC bias in social anxiety and fears of evaluation using the Bayesian computational method and a novel variation of beads task that taps into the core of social anxiety.

Based on the existing models of social anxiety, it was hypothesised that individuals with higher levels of social anxiety, fears of negative and positive evaluation will place heavier weights on both negative and positive feedback sampled in the social anxiety beads in favour of a negative social outcome, i.e., performing poorly (Heinrichs & Hofmann, 2001; Rapee & Heimberg, 1997). It was also hypothesised that these traits will not be significantly associated with the evidence weights assigned in the classic beads task and social neutral beads task.

Method

Participants

A total of 210 participants responded to the study via an online crowdsourcing platform, Prolific. The final data analysis included 169 participants (excluded 39 participants for failing comprehension checks for the beads tasks, one withdrew, and one detected as a potential bot). The final sample consisted of 51% females with a mean age of 40.93 (*SD* = 13.47), and 23.7% reported having a diagnosis of mental disorder(s).

Materials

Beads Tasks A computerised version of the beads tasks was constructed using the Qualtrics™. The instructions for the beads tasks were similar to the original version of the beads tasks reported by Garety et al. (1991) and Huq et al. (1988). The classic beads task involved viewing two jars of coloured beads with opposing beads ratios whereas the social neutral beads task involved viewing two clubs with opposing ratios of gender information. Meanwhile, the social anxiety beads task consisted of two audiences with opposing ratios of feedback for a presentation.

Each task comprised of two beads ratios; 55:45 represented the highest uncertainty and 90:10 reflected the lowest uncertainty within the task. The sequence of information for the 55:45 ratio was randomly generated once and fixed for all participants whereas the 90:10 sequence was derived from Moritz and Woodward (2005). Each task also consisted of two sequences in which the dominant information was manipulated. For example, in the classic beads task, Sequence 1 may have mostly red beads and Sequence 2 may have mainly blue beads. On the other hand, Sequence 1 in the social neutral beads task may have mostly male as the gender information and Sequence 2 may have mainly female as the gender information. For the social anxiety beads task, Sequence 1 involved mainly positive social feedback whereas Sequence 2 involved mainly negative social feedback. Altogether there were 12 versions of the beads task to complete.

After the first piece of information was presented, participants could either terminate the trial and report their decision about the source of information drawn so far or continue sampling more information until they reached a decision. All previously drawn information was shown on the screen as a memory aid. Participants also had to report their certainty level about the source of information drawn after seeing a new piece of information. Participants could request to see a maximum of 20 pieces of information. If a decision was not reached after the 20th draw, they would be prompted to make their decision and the trial would automatically terminate. The presentation of beads ratios, sequences, and types of beads task was randomised, and the "correct" decision for each task was pseudo-randomised as well.

Trait Measures There were six measures included in the study, which assessed psychotic-like experiences, social anxiety, positive and negative impression management, as well as the fears of negative and positive evaluation. For the purpose of current aims, only results concerning social anxiety and fears of evaluation would be reported.

The Social Interaction Anxiety Scale and Social Phobia Scale (SIAS-6 & SPS-6) were used to assess trait anxiety

associated with social interaction and fear of scrutiny (Peters et al., 2012). The Cronbach's alpha for the combined scales was .94. The Brief Fear of Negative Evaluation (BFNE) consisted of 12 items measuring the fear of negative evaluation (Leary, 1983). Only the straightforward items were included in the present data analysis following the recommendation by Weeks et al. (2005). The Cronbach's alpha for the 8-item BFNE was .96 for this sample. The Fear of Positive Evaluation Scale (FPES) was used to measure the fear of positive evaluation (Weeks et al., 2008). Only straightforward items were included in the present analysis. The Cronbach's alpha of the 8-item FPES was .89 for the present sample.

Procedure

Participants gave informed consent at the beginning of the study and completed a series of demographic questions about their age, gender, ethnicity, education, English proficiency, and history of mental health. Then, participants completed 12 classic, social neutral, and social anxiety beads tasks. Finally, participants responded to the set of questionnaires measuring trait variables that assessed delusion ideation, social anxiety, fears of evaluation, and impression management. Participants were debriefed at the end of the study and were provided with links to mental health resources. Participants were compensated £3.45 for completing the study which took about 35 minutes.

Results

The Bayesian model estimations were performed using "R2jags" package (Su & Yajima, 2021) on R version 3.6.2. For each model estimation, Markov Chain Monte Carlo four-chain processing was run with 10000 samples drawn from the posterior distributions and the first 1000 steps being discarded. Each model only included one trait variable at a time. The scores of SIAS-6 & SPS-6 (mean = 13.45, *SD* = 11.78), BFNE (mean = 21.64, *SD* = 8.91), and FPES (mean = 31.07, *SD* = 16.84) were standardised so that a standard deviation increase in these trait variables is associated with a standard deviation change in evidence weights assigned. The decision threshold in the model was fixed at the log of Bayes factor 3 which represented having substantial evidence supporting a particular hypothesis.

Each model was examined for its convergence, such that the model was said to have achieved convergence when the resulting $\hat{R}$ was less than 1.1 (Su & Yajima, 2021). All model estimations converged for this study with the largest $\hat{R}$ for a model estimation being 1.008, indicating that the results are reliable and interpretable (Gelman & Rubin, 1992). The more complex models that included a trait variable had lower DIC values compared to the simpler models that did not include a trait variable. This indicates that the more complex models had a better model fit than the simpler models. The summarised results are based on a minimum of 9000 samples averaged over four chains.

When mainly negative feedback was presented in the social anxiety beads task, the estimations indicated that participants generally placed significantly heavier weights on negative feedback in favour of the source that has a lower ratio of negative feedback (estimate = -1.36, 95%CI[-1.40, -1.32]) and significantly heavier weights on positive feedback in favour of the source that has a lower ratio of positive feedback (estimate = 1.54, 95%CI[1.50, 1.57]). Meanwhile, when mainly positive feedback was presented, significantly heavier weights were assigned to positive feedback in favour of the source that has a lower ratio of positive feedback (estimate = -.83, 95%CI[-.87, -.79];) and negative feedback was evaluated in favour of the source that has a lower ratio negative feedback (estimate = .93, 95%CI[.89, .98]). Thus, participants were generally slower in updating beliefs compared to a rational Bayesian agent as they placed heavier emphasis on the dominant information in favour of the less probable source of information, regardless of the sequences of feedback presented.

The model estimations further indicated that when mainly negative feedback was presented, higher fear of positive evaluation (FPE) was associated with significantly heavier weights assigned to negative feedback in favour of the source that has a lower ratio of negative feedback; and significantly heavier weights assigned to positive feedback in favour of the source that has a lower ratio of positive feedback. This suggested that higher FPE might promote slower belief updating about poor performance. Social anxiety and fear of negative evaluation (FNE) did not significantly bias the assignment of evidence weights (see Table 1). Meanwhile, when presented with mainly positive feedback, individuals with higher levels of social anxiety and FNE placed significantly heavier weights on positive feedback in favour of the source that has a higher ratio of positive feedback. Thus, higher levels of social anxiety and FNE promoted faster belief updating about performing well. No further significant influences from FPE were observed.

In the neutral beads tasks, participants generally placed significantly heavier weights on the dominant information in favour of the incorrect source which has a lower ratio of the dominant information (estimate = -1.13, 95%CI[-1.16, -1.10] for classic beads task; estimate = -1.26, 95%CI[-1.29, -1.23] for social neutral beads task). Significantly heavier weights were also assigned to secondary information in favour of the correct source which has a lower ratio of the secondary information in both classic beads task (estimate = 1.28, 95%CI[1.25, 1.32]) and social neutral beads task (estimate = 1.41, 95%CI[1.38, 1.44]). In other words, a similar trend of more cautious belief updating compared to a rational Bayesian agent was observed in neutral beads tasks.

Higher levels of social anxiety reduced the general overcautiousness in belief updating in the neutral beads tasks (see Table 1). Whilst FNE did not significantly influence evidence weighting, higher levels of FPE showed mixed influences on evidence weighting in neutral beads tasks. The results suggested that higher levels of FPE might promote faster belief updating in the classic beads task by assigning heavier weights to dominant information in favour of the correct source of information but did not significantly

influence the assignment of evidence weights in the social neutral beads task.

Interestingly, the model estimations indicated that participants were weighing both dominant and secondary information equally when the uncertainty level was the highest at 55:45 across all three variations of the beads tasks (see Figure 2). Social anxiety, FNE, and FPE also did not significantly influence the weighting of dominant and secondary information at this ratio. The biases in weighting information became more prominent when the uncertainty level was the lowest at the 90:10 ratio (see Figure 3). Participants demonstrated slower and more cautious belief updating compared to a rational Bayesian agent for this ratio.

To summarise, the hypothesis about the influences of social anxiety, FNE, and FPE in the social anxiety beads task was not supported. The hypothesis about insignificant associations between these trait variables and evidence weighting in the classic and social neutral beads tasks was partially supported.

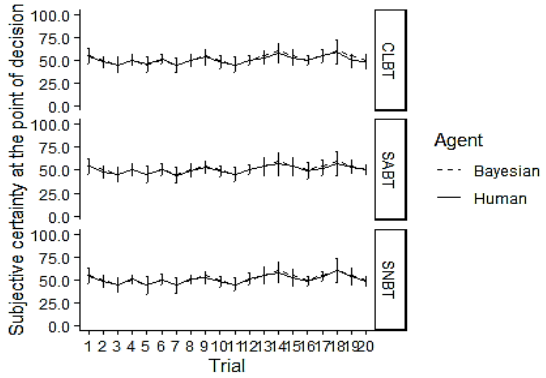

Figure 2: A comparison of belief updating rates between human and Bayesian agents for 55:45 ratio across classic, social anxiety, and social neutral beads tasks. The subjective certainty at the point of decision was averaged across 169 human participants. The Bayesian certainty was generated using the basic Bayes theorem assuming no error rates and unbiased evidence weighting.

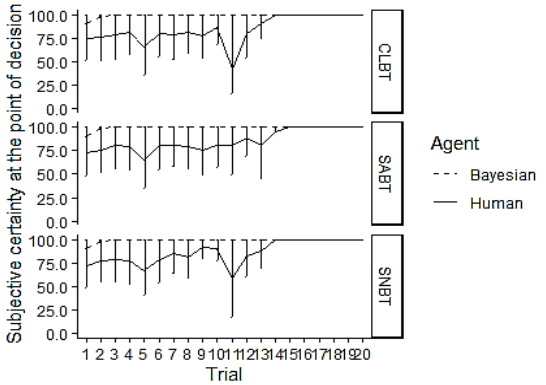

Figure 3: A comparison of belief updating rates between human and Bayesian agents for 90:10 ratio across classic, social anxiety, and social neutral beads tasks.

Table 1: Model estimations of biases in weighting evidence

Variable	Dominant information		Secondary information	
	Estimate	95%CI	Estimate	95%CI
CLBT				
SA	**.07**	**[.05, .10]**	**-.06**	**[-.09, -.03]**
FNE	-.01	[-.04, .02]	.03	[.00, .06]
FPE	**.04**	**[.01, .06]**	-.02	[-.05, .00]
SNBT				
SA	**.10**	**[.07, .12]**	**-.07**	**[-.10, -.04]**
FNE	.01	[-.02, .04]	.02	[.00, .05]
FPE	-.02	[-.05, .01]	.03	[.00, .06]
SABT+				
SA	**.14**	**[.10, .17]**	**-.14**	**[-.18, -.11]**
FNE	**.11**	**[.07, .14]**	**-.12**	**[-.15, -.08]**
FPE	.02	[-.02, .05]	-.03	[-.07, .00]
SABT-				
SA	-.02	[-.06, .02]	.00	[-.03, .04]
FNE	.03	[-.01, .07]	-.02	[-.06, .02]
FPE	**-.10**	**[-.14, -.06]**	**.05**	**[.01, .09]**

Note. CLBT = classic beads task, SNBT = social neutral beads task, SABT+ = social anxiety beads task with mainly positive feedback presented in a given full sequence, SABT- = social anxiety beads task with mainly negative feedback presented in a given full sequence, bold = significant estimations. The biases in weighting evidence are deemed significant if the 95% confidence intervals do not include a 0, which indicates even evidence weights for both sources of information.

Discussion

The present study sheds new perspectives on how social anxiety, fears of negative evaluation (FNE) and positive evaluation (FPE) could influence decision-making across three variations of the beads tasks using the Bayesian modelling approach. The hypothesised specificity of social anxiety and fears of evaluation in biasing the assignment of evidence weights was partially supported. Higher levels of FNE did not significantly influence the assignment of evidence weights in the absence of threat cues when the classic and social beads tasks were used. This is in line with the theories proposed in cognitive models of anxiety. However, the effects observed in the social anxiety beads task were unexpected. Whilst there were no significant biases in weighting evidence due to social anxiety and FNE when the full sequence of information consisted of mainly negative feedback, higher levels of social anxiety and FNE were associated with significant biases in assigning weights to information when mainly positive feedback was presented. In this condition, higher levels of social anxiety and FNE promoted faster belief updating about the positive social outcome, i.e., performing well.

The effects of social anxiety, FNE, and FPE observed in the present study are inconsistent with previous research that found negative interpretation biases and a lack of positivity bias in social anxiety (Chen et al., 2020; Koban et al., 2017). Several reasons could explain these inconsistencies. Firstly, the social scenario presented was about a hypothetical presentation completed in front of two large audiences. Given the hypothetical nature of the task, participants may not have interpreted the task as particularly threatening. Participants could have made their decisions in this task the same way they would in any other neutral situation. The general cautiousness in belief updating across three variations of the beads tasks provides preliminary evidence supporting this notion.

The nature of beads tasks could also explain the observed positive bias with increasing levels of social anxiety and FNE in this study. The beads tasks only reflected a snapshot of behaviours rather than a sequence of behavioural trends. Individuals with high levels of social anxiety and FNE could be momentarily receptive to positive feedback as indications of good performance (Heinrichs & Hofmann, 2001; Koban et al., 2017). However, the processing of the positive feedback may be impacted by later biased information processing in social anxiety such as rumination after the social event, which triggers a subsequent negative affect (Rapee & Heimberg, 1997). Specifically, individuals with higher social anxiety could fear that they would fail to meet others' high expectations following a good performance, that is exhibiting fear of positive evaluation (Heinrichs & Hofmann, 2001; Weeks et al., 2008). Following this perspective, the present finding suggests that the effects of social anxiety and fears of evaluation may not be immediately evident following positive feedback and may be exacerbated after a period of time in conjunction with rumination. Further investigations are warranted to support this speculation.

The current findings also did not support the hypothesis that social anxiety and FPE would not significantly bias the assignment of evidence weights in the absence of threat cues. Across both classic and social neutral beads tasks, higher levels of social anxiety promoted faster belief updating about the correct source of information. This suggests that individuals with higher social anxiety may have a more efficient way of updating beliefs about the more probable outcome by placing a heavier emphasis on the dominant information to revise their beliefs. These trends of faster belief updating also suggest that higher social anxiety may drive a need to avoid making incorrect decisions, thus, contributing to a different way of evaluating information compared to individuals with lower social anxiety. Overall, the present findings suggest that higher social anxiety may be associated with a reduced overcautiousness in belief updating in both neutral and social situations in which one receives a lot of positive feedback. However, given the large magnitude of general biases in evidence weighting which steers towards overcautiousness, the opposing biases from social anxiety and fears of evaluation in evidence weighting may be insufficient to outweigh the general overcautiousness. Hence, it is unlikely that social anxiety and fears of evaluations would significantly contribute to the JTC bias.

The present study has also deepened the current understanding of how individuals generally make decisions in the beads task. Based on the Bayesian model, it seems that individuals weigh information equally when the uncertainty level was the highest. Under this circumstance, individuals were updating their beliefs similarly to a rational Bayesian agent. However, when the uncertainty level is low, individuals became more conservative and deviated more from the Bayesian belief updating as they placed significantly heavier emphasis on dominant information in favour of the less probable outcome. This behaviour may reflect a general tendency to seek reassurance by gathering more information when the probable outcome was obvious.

Aside from uncovering the complexities in the relationship between social anxiety, fears of evaluation, and the jumping to conclusion bias, the present findings have important implications. This is the first study that applies the Bayesian model developed by Tan et al. (2022) to model real-life data concerning belief updating across different situations. This study shows promising results in terms of understanding the evidence weighting of binary information, given good model convergence and fitting. Future studies can consider applying this model across a wide variety of settings and populations to explore more factors, beyond social anxiety, that can influence evidence weighting and how they could contribute to the JTC bias. This can be achieved by replacing the trait variable parameter in the model with scores from any measures. Furthermore, longitudinal studies are warranted to test the speculation about the delayed effects of social anxiety and fear of evaluations in appraising positive feedback. Future studies could also consider inducing state social anxiety to investigate the causal effects of heightened social anxiety on the JTC bias.

The current findings are limited by the assumption that individuals perform Bayesian belief updating. The Bayes' theorem is often criticised as individuals generally do not reason like a Bayesian agent. However, the current findings focused on the role of social anxiety and fears of evaluation in exaggerating or reducing the deviations from the optimal Bayesian belief updating. Future studies are warranted to explore other belief updating and non-Bayesian models to investigate alternative explanations for the JTC bias.

To conclude, the present study suggests that social anxiety and fears of evaluation may be associated with the JTC bias given most of their significant influences on the assignment of evidence weights. These biases could occur depending on the situations such as when one receives a lot of positive feedback and in some neutral situations. However, the biases in evidence weighting in social anxiety and fears of evaluation may be too weak to outweigh the general tendency to be cautious in belief updating. Thus, these trait variables seem insufficient to in contributing to the JTC bias.

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