

Understanding psychological mechanisms linking social anxiety and paranoia: A cross-cultural general population survey in Thailand and the United Kingdom



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ABSTRACT

Effective interventions for treating social anxiety in psychosis, and understanding mechanisms between social anxiety to paranoia are limited. This study investigated stigma, internal and external shame, social rank appraisals, self-esteem and safety behaviours as mediators between social anxiety and paranoia in cross-cultural Thai and UK samples. Participants aged ≥ 18 -year-old completed a cross-sectional internet-delivered survey. Social anxiety, paranoia, depression, and hypothesised mediating variables were measured. Both of the Thailand and UK samples were analysed separately to explore cultural differences. Associations between social anxiety and paranoia were calculated by linear regression. Mediation analysis was used to test the indirect effects of mediators. Eight-hundred and forty-two people completed the survey (427 from Thailand: 415 from the UK). Linear relationships between social anxiety and paranoia were found across both countries. In multiple mediation analyses, the social anxiety-paranoia relationship controlling for depression was significantly mediated by external shame and safety behaviours in both countries. Self-esteem was also significant, but only in the UK. External shame and safety behaviours were significant mediators, cross-culturally, explaining the indirect pathway of the social anxiety-paranoia relationship. Interventions targeting external shame and safety behaviours should be tested in clinical population to guide intervention for psychosis. Hypothesised potential factors were discussed.

1. Introduction

Social anxiety disorder (SAD) is a common comorbidity in people experiencing psychosis (McEnery et al., 2019). This causes significant, negative impacts; including, poor quality of life, impaired functioning and depression (Karatzias et al., 2007; McEnery et al., 2019; Vrbova et al., 2017). Cognitive Behavioural Therapy (CBT) is the recommended treatment of choice for individuals diagnosed with SAD and psychosis (National Collaborating Centre for Mental Health (UK), 2013; National Institute for Health and Care Excellence, 2014). Despite this, there is currently no empirically established psychological interventions for alleviating social anxiety symptoms amongst individuals with psychosis (Michail et al., 2017). Because important mechanisms underlying social anxiety in psychosis are not yet fully understood (Michail et al., 2013; Michail et al., 2017), and paranoid thoughts (one of the major psychotic experiences) are frequently found amongst people with psychosis (Bentall et al., 2009; Paolini et al., 2016), this study aimed to examine

mechanisms that can be targeted in psychological treatments for social anxiety and paranoia.

1.1. Potential shared maintenance mechanisms on the social anxiety-paranoia hierarchy

Theories concerning the evolution of social mentalities suggest that negative appraisals of self trigger anxiety as to how we exist in the minds of others, and this provokes behavioural defences to manage the anxiety (Gilbert, 2014). Regarding the paranoia hierarchy model, levels of paranoid cognition can be understood as part of a hierarchy, with overlapping boundaries between experiences; such as social anxiety (concerns about the self as a focus of attention by others) and paranoia (more extreme fears that one is vulnerable to harm from others) (Freeman et al., 2005). Social anxiety and paranoia share the same predictive factors; including, anxiety, depression, worry and interpersonal sensitivity (Freeman et al., 2008); additionally, both are related to social

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power/rank and submissive behaviours (Gilbert et al., 2005). However, social anxiety and paranoia were found to be distinctive (Horton et al., 2014), which core experiences in social anxiety are related to fear of embarrassment, humiliation and loss of social status while paranoia is not (Freeman et al., 2005). The key differences were anomalous experiences associated with predicting paranoia (Freeman et al., 2008), and the presence of predisposition to hallucinations increasing the probability of processing paranoid ideation (Lopes and Pinto-Gouveia, 2013). Additionally, individuals that suffer from paranoia reported more severe and extensive exposure to traumatic experiences than those with social anxiety (Matos et al., 2013). Although, a lot of research is interested in the hierarchy between social anxiety and paranoia, the mechanisms by which social anxiety develops into paranoia are uncertain. Therefore, psychological factors that govern the relationship between social anxiety and paranoia were investigated; including, internal and external shame, safety behaviours, stigma, social rank and self-esteem (rationale of these hypothesised factors are presented in [Supplementary Table 1](#)).

1.2. The importance of cross-cultural evidence

Although, paranoia is a basic fear that is commonly found in general people (Gilbert, 2014), it is now well established, from a variety of studies amongst Western populations, that paranoid thinking is relatively common in non-clinical populations (Freeman et al., 2005; Johns LC et al., 2004; Kaymaz and van Os, 2010; Linscott and van Os, 2010). Nonetheless, cross-cultural evidence of non-Western populations, focusing on paranoia and its links to social anxiety, are limited. There is also likely to be a cultural dimension to how the hierarchy of social anxiety to paranoia is expressed, given how culture shapes other aspects of mental ill-health; such as, prevalent beliefs about the malevolence of content of persecutory delusions (Skodlar et al., 2008); levels of stigma and shame associated with mental illness (Moleiro, 2018); or experiences of shame in collectivists lower than individualists (Aunjitsakul et al., 2022).

As mentioned earlier, both social anxiety and paranoia are related to social concerns; thus, different cultures may differently impact the hierarchy of social anxiety and paranoia as well as hypothesised factors. It is generally known that people in collectivistic cultures (e.g., Thailand, Japan) value shyness, inhibition and humility as a sign of personal maturity (Hofmann et al., 2010). They then generally incline towards or agree to other opinions, submit to the demands of those in authority or sacrifice one's own needs for the sake of family; according to collectivism (Laungani, 2005). By doing this, they may provoke less conflict with society or sub-groups, and may have lower level of social anxiety and paranoia compared to individualistic cultures (e.g., UK, USA). Individualists rely on self-reliance, self-achievement or their needs may override the needs of the family (Laungani, 2005). They may also tend to criticize themselves and feel more negative affects in both success or failure (Arimitsu et al., 2019). Furthermore, because of this study being conducted in Thailand, where Buddhist principles affect Thai culture, the concept of Buddhism is closed to Eastern cultures; based on Confucianism or Taoism. So in that, they have respect for the discouragement of self-centredness, mindfulness, being connected with nature, non-interference in the course of natural events and compassion to oneself and others (Hwang, 2011; Kahn et al., 2017; Li et al., 2017). These concepts may influence how individuals perceive and interpret social contexts ranging from suspiciousness to social threats.

The hierarchy model of paranoia enables use of analogue samples to explore the processes that may underpin links from less (social anxiety) to more extreme (persecutory beliefs) forms of suspiciousness (Freeman et al., 2005). This study firstly set out to examine the potential factors mediating the relationship between social anxiety and paranoia within general populations. Secondly, we aimed to compare these processes using cross-cultural samples between non-Western and Western settings: recruited from Thailand and the UK. We hypothesised that: 1) in both Thailand and UK samples there would be an independent, direct effect of

social anxiety predicting paranoia (controlling for depression) and 2) whether hypothesised mechanisms (including internal and external shame, safety behaviours, stigma, social rank and self-esteem) mediate the association of social anxiety and paranoia.

The hypothesised mechanisms of non-clinical samples could be a potential factor which need to be further tested in clinical population, and help guide treatment development for people with suspicious thinking across the range of severity that transitions from social anxiety to paranoia. Additionally, cross-cultural evidence could improve; either the differences or similarities of, knowledge of psychological interventions, which might apply to individual cultures more locally.

2. Methods

The Personal Attitudes towards Social life related to Oneself (PASO) survey was a cross-sectional internet-based questionnaire study, via sampling people from the general population in Thailand and the UK. Following the ethical principles of the Declaration of Helsinki, the survey was approved by the Ethics Committee of the Faculty of Medicine, Prince of Songkla University, Thailand (Code: REC.62-179-3-1) and the College of Medical, Veterinary & Life Sciences, University of Glasgow, UK (Code: 200180144).

2.1. Participants

Inclusion criteria for eligible participants were aged at least 18-year-old, currently living in Thailand or the UK, and having a fluent understanding of either Thai or English. Due to the right to withdraw anytime, participants who partially responded were excluded.

2.2. Measurements

Nine instruments were used in this study. Of these, two had both English and Thai versions - the Depression Anxiety Stress Scale (DASS) and the Rosenberg Self Esteem Scale (RSES). The other instruments were translated from English into Thai, then back-translated to English by two independent translators (Warut Aunjitsakul and the other in a different academic field), according to guidelines for the process of cross-cultural adaptation of self-report measures (Beaton et al., 2000). Any discrepancies were resolved by consensus with Andrew Gumley and Hamish McLeod. Measurement details of all variables (paranoia, social anxiety, internal and external shame, safety behaviours, stigma, social rank and self-esteem) are described in [Supplementary Table 1](#).

2.3. Data collection

Participants were recruited via multiple channels including: via personal contacts, website advertisements (e.g. University websites), social media (Twitter, Facebook, Gumtree, Reddit, Freeads) and via posters posted throughout the Community, University or third sector organisations. The participants were invited to the study by entering through the link or scanning the QR code from advertisements. On the first page, the participant information sheet was presented; they agreed to take part by clicking a consenting checkbox. Participants were then asked to complete the instruments. Brief demographics; including, age, gender, ethnicity, job-related to health care (i.e., is your job (or part of your job) related to health care, or mental fitness?) and history of mental health problems (i.e., have you ever been diagnosed by a doctor with mental issues?) were collected. No data sets were collected for those with partial responses, because they did not reach the last page that was required to complete the demographic data. Incentives in each country were offered to those participants who consented, in the form of a prize draw: 1,000 Thai Baht (Thailand) and £50 vouchers (the UK).

2.4. Data analysis

IBM SPSS Statistics for Windows, Version 28.0 was used for all data analyses. Cultural differences were examined by analysing data from Thailand and the UK separately. Descriptive statistics were used to explore study population characteristics and factors; such as, social anxiety, paranoia, negative affect, stigma, shame, social rank, self-esteem and safety behaviours. Cultural differences (e.g., on ideas of reference, paranoia, social anxiety, stigma) were analysed by independent Student's *t*-test and Mann-Whitney *U* test for continuous data and Chi-square test for categorical data. Cronbach's alpha was calculated to determine the internal consistency of measurements rated by participants of each country. A normality test was performed to estimate distributions of data. Inter-variable associations were calculated using Spearman's correlation coefficients. Hierarchical multiple linear regression was conducted to investigate associations of social anxiety with paranoia (Ideas of Reference (called IoR) and Persecutory fear) and all potential factors. Multicollinearity was checked in the regression model, if a variable presented Variance Inflation Factor (VIF) > 5 and tolerance <0.2, it was removed from the model (Christopher and Odum, 2019). We used mediation analysis to test whether of which variable(s) had mediating association between social anxiety and paranoia. The simple and parallel multiple mediation models, with co-varying for depression, were established following hypotheses 1 and 2. The PROCESS macro for SPSS version 3.4 was used for mediation analyses (Hayes, 2018). From this, 10,000

bias-corrected bootstrap samples were performed to estimate 95% confidence intervals of indirect effect. Additional details of post-hoc analyses are presented in the Method section in the Appendix of Supplementary Material.

3. Results

3.1. Demographic data and psychological factors

Potential participants (949 from Thailand and 3,612 from the UK) accessed the survey through the internet, those with partial responses were excluded due to incomplete datasets; in total 428 (45.1%) Thai and 415 (11.5%) UK participants completed the questionnaires. One participant from Thailand was removed due to being aged <18-year-old. There were 842 respondents in total. There were more female respondents from both countries. The mean age of Thai and UK samples was comparable at 36.2 and 34.3 years, respectively (Table 1). Participants who self-reported a history of mental health problems were 117 (27.4%) in Thailand and 311 (74.9%) in the UK. Two-fifths of Thailand (*n* = 170, 39.8%) and one-third of UK participants (*n* = 123, 29.6%) had jobs related to health care and mental health (see job details in Supplementary Table 2).

The mean of the overall value of Cronbach's alpha for all scales was 0.90 (range = 0.74 (good) - 0.98 (excellent) for Thailand and 0.93 (0.86 (very good) - 0.98 (excellent)) for the UK, representing the measurements

Table 1

Demographic and psychological factors with its terciles compared between Thailand (*n* = 427) and the UK (*n* = 415) (*N* total = 842).

| Variables by country | Mean ± SD | | Mean difference (95% CI) | p-value ^a | Median (Q1, Q3) | | p-value ^b |
|---|-------------------------------|-------------------------------|-----------------------------|----------------------|-----------------|-------------|----------------------|
| | Thailand | UK | | | Thailand | UK | |
| Gender (Female); <i>n</i> (%) | 294 (68.9) | 332 (80.0) | – | < 0.001 ^c | – | – | – |
| Age (Years) | 36.2 ± 10.4 (max-min = 18-69) | 34.3 ± 12.4 (max-min = 18-73) | 1.899 (0.349, 3.449) | 0.017 | 33 (30, 40) | 32 (25, 41) | < 0.001 |
| Self-reported a history of mental health problems; <i>n</i> (%) | 117 (27.4) | 311 (74.9) | – | < 0.001 ^c | – | – | – |
| Jobs related to health care or mental fitness ^d ; <i>n</i> (%) | 170 (39.8) | 123 (29.6) | – | 0.002 ^c | – | – | – |
| SIAS | 26.4 ± 14.2 | 39.3 ± 18.3 | –12.968 (–15.182, –10.753) | < 0.001 | 23 (16, 35) | 38 (24, 54) | < 0.001 |
| Social phobia group ^e ; <i>n</i> (%) | 98 (23.0) | 222 (53.5) | – | < 0.001 ^c | – | – | – |
| GPTS Reference | 31.7 ± 9.4 | 33.3 ± 14.6 | –1.655 (–3.315, 0.004) | 0.052 | 30 (24, 37) | 30 (21, 44) | 0.538 |
| GPTS Persecutory | 23.0 ± 9.1 | 25.6 ± 14.2 | –2.633 (–4.247, –1.019) | 0.002 | 19 (17, 26) | 18 (16, 29) | 0.426 |
| RIBS (items 5–8) | 11.0 ± 3.9 | 6.5 ± 3.4 | 4.466 (3.970, 4.962) | < 0.001 | 11 (8, 14) | 5 (4, 8) | < 0.001 |
| ISS | 21.2 ± 20.0 | 51.5 ± 26.7 | –30.291 (–33.474, –27.108) | < 0.001 | 16 (7, 29) | 53 (29, 73) | < 0.001 |
| OASS | 15.9 ± 12.2 | 30.7 ± 16.9 | –14.736 (–16.726, –12.745) | < 0.001 | 14 (7, 20) | 30 (17, 43) | < 0.001 |
| SCS | 61.8 ± 23.9 | 41.8 ± 17.2 | 19.928 (17.105, 22.750) | < 0.001 | 64 (48, 80) | 41 (29, 53) | < 0.001 |
| RSES | 31.4 ± 5.5 | 24.1 ± 7.2 | 7.323 (6.456, 8.191) | < 0.001 | 32 (28, 36) | 24 (19, 29) | < 0.001 |
| SAFE | 27.4 ± 18.4 | 47.1 ± 26.8 | –19.700 (–22.799, –16.601) | < 0.001 | 25 (13, 37) | 46 (25, 65) | < 0.001 |
| DASS Stress | 10.9 ± 9.2 | 20.3 ± 11.0 | –9.442 (–10.808, –8.077) | < 0.001 | 10 (4, 16) | 20 (12, 28) | < 0.001 |
| DASS Anxiety | 7.5 ± 7.9 | 14.9 ± 11.7 | –7.359 (–8.702, –6.016) | < 0.001 | 4 (2, 12) | 12 (6, 24) | < 0.001 |
| DASS Depression | 8.7 ± 8.8 | 19.9 ± 13.4 | –11.197 (–12.725, –9.668) | < 0.001 | 6 (2, 12) | 18 (8, 32) | < 0.001 |

CI, Confidence Interval; DASS, Depression Anxiety Stress Scales; GPTS, Green Paranoid Thought Scales; ISS, Internalised Shame Scale; OASS, Other As Shamer Scale; RIBS, Reported and Intended Behaviour Scale; RSES, Rosenberg Self-Esteem Scale; SAFE, Subtle Avoidance Frequency Examination; SCS, Social Comparison Scale; SIAS, Social Interaction Anxiety Scale.

Data are mean ± SD and Median (Q1-Q3) unless otherwise indicate.

^a Independent samples *t*-test (two-sided *p*-value).

^b Independent samples Mann-Whitney *U* Test.

^c Pearson Chi-Square.

^d More details described in Supplementary Table 2.

^e Social group determined by SIAS cut off score >36.

to be generally rated as adequate to excellent internal consistency (Supplementary Table 3). Regarding social phobia determined by the cut-off score of SIAS, the UK (n = 222, 53.5%) was observed to have more socially anxious people than Thailand (n = 98, 23.0%). Generally, the UK sample reported significantly higher mean scores for social anxiety, persecutory (not IoR), internal shame, external shame, safety behaviours and negative affect (stress, anxiety and depression) than the Thai sample. Only three variables: stigma, social rank and self-esteem of the UK sample were significantly lower compared to the Thai sample. Considering the median, there was no significant difference between groups of both IoR and persecutory. Reporting stigma was also described in the Results section in Appendix of Supplementary Material.

3.2. Intercorrelations of factors influencing paranoia and social anxiety

According to the normality test, no normal distributions were found amongst observed variables, Spearman's correlation coefficient was then calculated to estimate the associations. The association of social anxiety with paranoia (IoR and Persecutory fears) was $\rho = 0.50$ ($p < 0.01$) and 0.32 ($p < 0.01$) in Thailand; and $\rho = 0.62$ ($p < 0.01$) and 0.46 ($p < 0.01$) in the UK, respectively. Social anxiety was also significantly associated with internal shame, external shame, social rank, self-esteem, safety behaviours, stress, anxiety and depression scores in both samples. Stigma was generally not associated with other variables. Other findings are presented in Table 2.

3.3. Hierarchical regression analysis of social anxiety associated with paranoia

Considering Hypothesis 1: in both Thailand and the UK samples, we predicted a direct effect of social anxiety on paranoia, regression models were found to have a linear relationship between social anxiety and paranoia: IoR in Thailand (SIAS: B 0.26, $p < 0.001$) and the UK (B 0.38, $p < 0.001$); and persecutory in Thailand (B 0.13, $p < 0.001$) and the UK (B 0.21, $p < 0.001$), see Table 3 and Table 4). After adjustment for depression, social anxiety remained significantly associated with IoR in both Thai (SIAS: B 0.34, $p < 0.001$) and UK (B 0.18, $p < 0.001$) samples, and remained significantly associated with persecutory (B 0.23, $p < 0.001$) in the UK; however, there was no significant relationship (B 0.07, $p = 0.06$) in Thailand.

In hierarchical regression analyses was controlled for depression in model 5 (Table 3 and 4), multicollinearity was found in both countries, for which internal shame showed values of tolerance < 0.2 and VIF > 5 . Therefore, it was removed from (following) multiple regression and mediation analyses. When all factors (excluding internal shame) were adjusted (Model 6, Table 3), social anxiety, external shame, depression and safety behaviours were significantly associated with IoR (SIAS: B

0.08, $p = 0.04$; OASS: B 0.27; $p < 0.001$; DASS Depression B 0.24, $p < 0.001$; and SAFE: B 0.03, $p = 0.03$) in the Thai sample; wherein, for the UK sample only external shame and safety behaviours were significant (OASS: B 0.43; $p < 0.001$; and SAFE: B 0.15, $p < 0.001$). Regarding persecutory fear (Model 6, Table 4), external shame, depression and safety behaviours these were significantly associated with persecutory (OASS: B 0.30, $p < 0.001$; DASS Depression B 0.16, $p < 0.001$; and SAFE: B 0.08, $p = 0.01$) in the Thai sample; whereas, external shame, self-esteem and safety behaviours were significant in the UK sample (OASS: B 0.45; $p < 0.001$; RSES B 0.39, $p = 0.005$ and SAFE: B 0.15, $p < 0.001$).

3.4. Mediation analysis investigating the direct, indirect and total effects of social anxiety towards paranoia, with co-varying as depression

Mediation analysis was conducted to address Hypothesis 2 (in that the association between social anxiety and paranoia is fully mediated by stigma, shame, social rank, self-esteem and safety behaviours). Because of no significant associations of stigma with all potential variables, stigma was excluded from mediation analyses. Additionally, internal shame was excluded from multiple mediation analyses; due to multicollinearity, but retained in the simple mediation analysis, because significant associations were found with other variables. Therefore, internal and external shame, social rank, self-esteem and safety behaviours were used in simple mediation analyses; meanwhile, only four factors: external shame, social rank, self-esteem and safety behaviours, were introduced in the multiple mediation model with co-varying as depression (see the pathway in Fig. 1 Panel A and B). The results were presented by countries reporting simple and multiple mediation outcomes associated with social anxiety (an independent variable) and two types of paranoia: IoR and persecutory (a dependent variable); as per Table 5 and 6 (see Fig. 2).

Overall, we found that shame appraisals and safety behaviours were found to be significant mediators amongst both Thai and UK samples. Internal and external shame and safety behaviours potentially mediated social anxiety-IoR/persecutory relationships amongst both samples from simple mediation analyses (Fig. 3). Considering multiple mediation analyses, external shame was a robust mediator across countries in explaining the relationship between social anxiety and paranoia (IoR and persecutory). The safety behaviours factor was also a potential mediator of social anxiety-paranoia; however, there was no significant evidence in social anxiety-IoR in Thailand. Additionally, self-esteem was a rather significant mediator in the UK but was not replicated in the Thai sample. More details of mediator outcomes; including, sensitivity analyses are shown in the Results section in Appendix of Supplementary Material.

4. Discussion

This current study was designed to explore hypothesised mediators of

Table 2 Intercorrelations of potential variables of Thailand (n = 427) and the UK (n = 415) using Spearman's correlation.

| Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---------------------|--------|--------|--------|-------|--------|--------|--------|--------|--------|--------|--------|-----------------|
| 1. SIAS | 1 | 0.50* | 0.32* | 0.03 | 0.61* | 0.51* | -0.25* | -0.50* | 0.71* | 0.54* | 0.54* | 0.55* |
| 2. GPTS Reference | 0.62* | 1 | 0.69* | 0.03 | 0.56* | 0.58* | -0.11 | -0.40* | 0.50* | 0.60* | 0.55* | 0.53* |
| 3. GPTS Persecutory | 0.46* | 0.78* | 1 | 0.05 | 0.43* | 0.52* | -0.02 | -0.31* | 0.39 | 0.48* | 0.46* | 0.42* |
| 4. RIBS (items 5-8) | -0.09 | -0.02 | 0.004 | 1 | 0.01 | -0.01 | 0.05 | -0.09 | 0.05 | -0.01 | 0.04 | -0.03 |
| 5. ISS | 0.76* | 0.67* | 0.54* | -0.13 | 1 | 0.79* | -0.29* | -0.69* | 0.60* | 0.68* | 0.63* | 0.70* |
| 6. OASS | 0.71* | 0.71* | 0.63* | -0.07 | 0.85* | 1 | -0.17* | -0.57* | 0.55* | 0.60* | 0.57* | 0.59* |
| 7. SCS | -0.48* | -0.36* | -0.28* | 0.10 | -0.53* | -0.49* | 1 | 0.35* | -0.21* | -0.16* | -0.17 | -0.19 |
| 8. RSES | -0.70* | -0.57* | -0.43* | 0.09 | -0.84 | -0.73* | 0.53* | 1 | -0.48* | -0.53* | -0.51* | -0.61* |
| 9. SAFE | 0.80* | 0.66* | 0.54* | -0.02 | 0.75* | 0.74* | -0.45* | -0.64* | 1 | 0.58* | 0.61* | 0.56* |
| 10. DASS Stress | 0.61* | 0.60* | 0.56* | -0.04 | 0.73* | 0.66* | -0.44* | -0.60* | 0.63* | 1 | 0.79* | 0.78* |
| 11. DASS Anxiety | 0.64* | 0.65* | 0.59* | -0.03 | 0.74* | 0.69* | -0.43* | -0.64 | 0.72* | 0.78* | 1 | 0.72* |
| 12. DASS Depression | 0.62* | 0.55* | 0.50* | -0.05 | 0.78* | 0.68* | -0.47* | -0.77* | 0.59* | 0.74* | 0.69* | 1 |
| | | | | | | | | | | | | UK [†] |

DASS, Depression Anxiety Stress Scales; GPTS, Green Paranoid Thought Scales; ISS, Internalised Shame Scale; OASS, Other As Shamer Scale; RIBS, Reported and Intended Behaviour Scale; RSES, Rosenberg Self-Esteem Scale; SAFE, Subtle Avoidance Frequency Examination; SCS, Social Comparison Scale; SIAS, Social Interaction Anxiety Scale * $p < 0.01$ † Values of Pearson's correlation coefficient of Thailand are in white shading, and of the UK are in light grey.

Table 3
 Linear regression analysis of GPTS reference (a dependent variable) compared between Thailand (n = 427) and the UK (n = 415).

| Model | Independent variables | TH | | | | | UK | | | | | | | | | | | | | | | | | | | | |
|----------------|-----------------------|-------------------------|-----------------------------|-----------|---------------------------|--------|--------|-------------------------|-----------|-------------------------|-----------------------------|--------|---------------------------|--------|--------|-------------------------|------|-----------|-------|--------|--------|------|--------|-------|--------|------|------|
| | | Adjusted R ² | Unstandardised Coefficients | | Standardised Coefficients | t | Sig. | Collinearity Statistics | | Adjusted R ² | Unstandardised Coefficients | | Standardised Coefficients | t | Sig. | Collinearity Statistics | | | | | | | | | | | |
| | | | B | Std error | | | | Beta | Tolerance | | VIF | B | | | | Std error | Beta | Tolerance | VIF | | | | | | | | |
| 1 | (Constant) | 0.26 | 22.70 | 0.83 | 0.51 | 27.38 | <0.001 | 1.00 | 1.00 | 0.38 | 13.84 | 1.34 | 0.62 | 10.37 | <0.001 | 1.00 | 1.00 | | | | | | | | | | |
| | SIAS | | 0.34 | 0.03 | | | | | | | 0.50 | 0.03 | | | | | | 0.62 | 16.10 | <0.001 | | | | | | | |
| 2 | (Constant) | 0.26 | 23.60 | 1.93 | 0.50 | 12.22 | <0.001 | 0.87 | 1.15 | 0.39 | 18.33 | 2.20 | 0.61 | 8.32 | <0.001 | 0.97 | 1.03 | | | | | | | | | | |
| | SIAS | | 0.34 | 0.03 | | | | | | | 0.50 | 0.03 | | | | | | 0.61 | 15.58 | <0.001 | | | | | | | |
| 3 | Age | 0.26 | -0.02 | 0.04 | -0.02 | -0.52 | 0.604 | 0.87 | 1.15 | 0.39 | -0.12 | 0.05 | -0.10 | -2.66 | 0.011 | 0.97 | 1.03 | | | | | | | | | | |
| | (Constant) | | 23.94 | 52.55 | | | | | | | 9.39 | <0.001 | | | | | | 16.05 | 3.28 | 4.89 | <0.001 | | | | | | |
| | SIAS | | 0.33 | 0.03 | | | | | | | 0.50 | 11.23 | | | | | | <0.001 | 0.87 | 1.15 | 0.48 | 0.03 | 0.60 | 15.54 | <0.001 | 0.97 | 1.03 |
| 4 | Age | 0.35 | -0.02 | 0.04 | -0.02 | -0.54 | 0.592 | 0.86 | 1.16 | 0.44 | -0.12 | 0.05 | -0.10 | -2.58 | 0.010 | 0.97 | 1.03 | | | | | | | | | | |
| | Gender (Male) | | -0.18 | 0.86 | | | | | | | -0.01 | -0.20 | | | | | | 0.839 | 0.99 | 1.01 | 1.32 | 1.40 | 0.04 | 0.94 | 0.348 | 1.00 | 1.00 |
| | (Constant) | | 25.47 | 2.39 | | | | | | | 10.65 | <0.001 | | | | | | 17.76 | 3.16 | 5.62 | <0.001 | | | | | | |
| | SIAS | | 0.18 | 0.03 | | | | | | | 0.27 | 5.15 | | | | | | <0.001 | 0.57 | 1.75 | 0.34 | 0.04 | 0.42 | 8.75 | <0.001 | 0.59 | 1.71 |
| 5 | Age | 0.43 | -0.03 | 0.04 | -0.03 | -0.76 | 0.445 | 0.86 | 1.16 | 0.60 | -0.15 | 0.04 | -0.13 | -3.43 | <0.001 | 0.96 | 1.04 | | | | | | | | | | |
| | Gender (Male) | | -0.60 | 0.80 | | | | | | | -0.03 | -0.75 | | | | | | 0.453 | 0.98 | 1.02 | 0.73 | 1.34 | 0.20 | 0.54 | 0.589 | 0.99 | 1.00 |
| | DASS Depression | | 0.41 | 0.05 | | | | | | | 0.39 | 7.82 | | | | | | <0.001 | 0.63 | 1.59 | 0.32 | 0.05 | 0.29 | 6.09 | <0.001 | 0.60 | 1.67 |
| | (Constant) | | 18.56 | 4.34 | | | | | | | 4.28 | <0.001 | | | | | | 14.46 | 5.55 | 2.61 | 0.009 | | | | | | |
| | SIAS | | 0.09 | 0.04 | | | | | | | 0.13 | 2.13 | | | | | | 0.034 | 0.37 | 2.73 | 0.02 | 0.05 | 0.03 | 0.47 | 0.641 | 0.28 | 3.63 |
| | Age | | -0.03 | 0.04 | | | | | | | -0.03 | -0.77 | | | | | | 0.444 | 0.82 | 1.22 | -0.18 | 0.04 | -0.15 | -4.69 | <0.001 | 0.93 | 1.07 |
| | Gender (Male) | | -0.29 | 0.77 | | | | | | | -0.01 | -0.38 | | | | | | 0.707 | 0.94 | 1.06 | -0.05 | 1.15 | -0.001 | -0.04 | 0.968 | 0.98 | 1.03 |
| | DASS Depression | | 0.25 | 0.07 | | | | | | | 0.23 | 3.73 | | | | | | <0.001 | 0.35 | 2.85 | 0.11 | 0.06 | 0.10 | 1.92 | 0.056 | 0.34 | 2.94 |
| | RIBS (items 5-8) | | 0.10 | 0.09 | | | | | | | 0.04 | 1.08 | | | | | | 0.282 | 0.93 | 1.08 | 0.14 | 0.14 | 0.03 | 1.02 | 0.309 | 0.94 | 1.06 |
| | ISS | | -0.01 | 0.04 | | | | | | | -0.03 | -0.27 | | | | | | 0.784 | 0.16 | 6.15 | -0.05 | 0.05 | -0.08 | -1.01 | 0.313 | 0.15 | 6.80 |
| 6 ^a | OASS | 0.43 | 0.28 | 0.05 | 0.36 | 5.33 | <0.001 | 0.30 | 3.34 | 0.46 | 0.05 | 0.53 | 8.42 | <0.001 | 0.25 | 4.07 | | | | | | | | | | | |
| | SCS | | 0.01 | 0.02 | 0.03 | 0.66 | 0.512 | 0.87 | 1.15 | 0.03 | 0.03 | 0.04 | 0.96 | 0.338 | 0.67 | 1.49 | | | | | | | | | | | |
| | RSES | | 0.08 | 0.10 | 0.05 | 0.81 | 0.418 | 0.38 | 2.61 | 0.04 | 0.13 | 0.02 | 0.28 | 0.780 | 0.25 | 4.07 | | | | | | | | | | | |
| | SAFE | | 0.06 | 0.03 | 0.12 | 2.15 | 0.032 | 0.42 | 2.37 | 0.15 | 0.03 | 0.28 | 4.75 | <0.001 | 0.28 | 3.54 | | | | | | | | | | | |
| | (Constant) | | 18.22 | 4.15 | 4.39 | <0.001 | 12.38 | 5.15 | 2.40 | 0.017 | | | | | | | | | | | | | | | | | |
| | SIAS | | 0.08 | 0.04 | 0.13 | 2.12 | 0.035 | 0.38 | 2.61 | 0.02 | 0.05 | 0.02 | 0.32 | 0.747 | 0.28 | 3.56 | | | | | | | | | | | |
| | Age | | -0.03 | 0.04 | -0.03 | -0.75 | 0.454 | 0.83 | 1.21 | -0.18 | 0.04 | -0.15 | -4.62 | <0.001 | 0.94 | 1.07 | | | | | | | | | | | |
| | Gender (Male) | | -0.31 | 0.77 | -0.02 | -0.40 | 0.689 | 0.95 | 1.05 | -0.10 | 1.15 | -0.003 | -0.09 | 0.930 | 0.98 | 1.02 | | | | | | | | | | | |
| | DASS Depression | | 0.24 | 0.06 | 0.23 | 3.91 | <0.001 | 0.41 | 2.47 | 0.09 | 0.06 | 0.09 | 1.69 | 0.091 | 0.37 | 2.67 | | | | | | | | | | | |
| | RIBS (items 5-8) | | 0.10 | 0.09 | 0.04 | 1.09 | 0.278 | 0.93 | 1.08 | 0.16 | 0.14 | 0.04 | 1.17 | 0.244 | 0.96 | 1.04 | | | | | | | | | | | |
| 6 ^a | OASS | 0.43 | 0.27 | 0.04 | 0.35 | 6.63 | <0.001 | 0.49 | 2.03 | 0.43 | 0.05 | 0.50 | 8.86 | <0.001 | 0.30 | 3.30 | | | | | | | | | | | |
| | SCS | | 0.01 | 0.02 | 0.03 | 0.69 | 0.493 | 0.88 | 1.14 | 0.03 | 0.03 | 0.04 | 0.97 | 0.331 | 0.67 | 1.49 | | | | | | | | | | | |
| | RSES | | 0.09 | 0.10 | 0.05 | 0.97 | 0.333 | 0.44 | 2.29 | 0.09 | 0.12 | 0.04 | 0.72 | 0.473 | 0.29 | 3.48 | | | | | | | | | | | |
| | SAFE | | 0.03 | 0.03 | 0.12 | 2.17 | 0.031 | 0.42 | 2.36 | 0.15 | 0.03 | 0.27 | 4.66 | <0.001 | 0.29 | 3.47 | | | | | | | | | | | |

DASS, Depression Anxiety Stress Scales; GPTS, Green Paranoid Thought Scales; ISS, Internalised Shame Scale; OASS, Other As Shamer Scale; RIBS, Reported and Intended Behaviour Scale; RSES, Rosenberg Self-Esteem Scale; SAFE, Subtle Avoidance Frequency Examination; SCS, Social Comparison Scale; SIAS, Social Interaction Anxiety Scale.

^a Due to multicollinearity, ISS was removed from the model 5.

Table 4
 Linear regression analysis of GPTS persecutory (a dependent variable) compared between Thailand (n = 427) and the UK (n = 415).

| Model | Independent variables | TH | | | | | | UK | | | | | | | | | | | | | | | |
|------------------|-----------------------|---------------------------------|--------------------------------|--------------|--|-------|--------|--|-------|---------------------------------|--------------------------------|--------------|--|-------|--------|--|------|--------|------|------|--------|------|------|
| | | Adjus- ted R ² | Unstandardised Coefficients | | Standar-dised Coeffici-ents Beta | t | Sig. | Collinearity Statistics Tolera- nce | VIF | Adjus- ted R ² | Unstandardised Coefficients | | Standar-dised Coeffici-ents Beta | t | Sig. | Collinearity Statistics Tolera- nce | VIF | | | | | | |
| | | | B | Std error | | | | | | | B | Std error | | | | | | | | | | | |
| 1 | (Constant) | 0.13 | 16.88 | 0.87 | 0.36 | 19.38 | <0.001 | 1.00 | 1.00 | 0.21 | 11.58 | 1.48 | 0.46 | 7.85 | <0.001 | 1.00 | 1.00 | | | | | | |
| | SIAS | | 0.23 | 0.03 | | 7.94 | <0.001 | | | | 0.36 | 0.03 | | 10.48 | <0.001 | | | | | | | | |
| 2 | (Constant) | 0.13 | 14.87 | 2.03 | 0.38 | 7.34 | <0.001 | 0.87 | 1.15 | 0.21 | 9.10 | 2.45 | 0.47 | 3.72 | <0.001 | 0.97 | 1.03 | | | | | | |
| | SIAS | | 0.24 | 0.03 | | 7.81 | <0.001 | | | | 0.36 | 0.03 | | 10.56 | <0.001 | | | | | | | | |
| 3 | Age | 0.13 | 0.05 | 0.04 | 0.05 | 1.10 | 0.273 | 0.87 | 1.15 | 0.21 | 0.06 | 0.05 | 0.06 | 1.27 | 0.206 | 0.97 | 1.03 | | | | | | |
| | (Constant) | | 15.64 | 2.68 | | 5.85 | <0.001 | | | | 8.46 | 3.65 | | 2.32 | 0.021 | | | | | | | | |
| | SIAS | | 0.24 | 0.03 | | 0.38 | 7.75 | | | | <0.001 | 0.87 | | 1.15 | 10.54 | | | <0.001 | 0.97 | 1.03 | | | |
| 4 | Age | 0.25 | 0.05 | 0.04 | 0.05 | 1.04 | 0.297 | 0.86 | 1.16 | 0.25 | 0.06 | 0.05 | 0.06 | 1.26 | 0.210 | 0.97 | 1.03 | | | | | | |
| | Gender (Male) | | -0.39 | 0.90 | | -0.02 | -0.44 | | | | 0.663 | 0.99 | | 1.01 | 0.37 | | | 1.56 | 0.01 | 0.24 | 0.813 | 1.00 | 1.00 |
| | (Constant) | | 17.34 | 2.49 | | 6.97 | <0.001 | | | | 9.97 | 3.58 | | 2.79 | 0.006 | | | | | | | | |
| | SIAS | | 0.07 | 0.04 | | 0.10 | 1.87 | | | | 0.062 | 0.57 | | 1.75 | 0.23 | | | 0.04 | 0.30 | 5.41 | <0.001 | 0.59 | 1.71 |
| | Age | | 0.04 | 0.04 | | 0.04 | 0.92 | | | | 0.357 | 0.86 | | 1.16 | -0.03 | | | 0.05 | 0.03 | 0.69 | 0.492 | 0.96 | 1.04 |
| 5 | Gender (Male) | 0.36 | -0.87 | 0.84 | -0.04 | -1.04 | 0.298 | 0.98 | 1.02 | 0.43 | -0.15 | 1.52 | -0.00 | -0.10 | 0.922 | 0.99 | 1.01 | | | | | | |
| | DASS Depression | | 0.46 | 0.06 | 0.44 | 8.37 | <0.001 | 0.63 | 1.59 | | 0.28 | 0.06 | 2.61 | 4.73 | <0.001 | 0.60 | 1.67 | | | | | | |
| | (Constant) | | 11.23 | 4.44 | 2.53 | 0.012 | 4.35 | 6.42 | 0.68 | | 0.499 | | | | | | | | | | | | |
| | SIAS | | -0.05 | 0.04 | -0.07 | -1.14 | 0.253 | 0.37 | 2.73 | | -0.04 | 0.06 | -0.05 | -0.66 | 0.508 | 0.28 | 3.63 | | | | | | |
| | Age | | 0.04 | 0.04 | 0.04 | 0.96 | 0.337 | 0.82 | 1.22 | | -0.00 | 0.04 | 0.00 | -0.01 | 0.990 | 0.93 | 1.07 | | | | | | |
| | Gender (Male) | | -0.60 | 0.79 | -0.03 | -0.76 | 0.447 | 0.94 | 1.06 | | -0.90 | 1.33 | -0.03 | -0.68 | 0.499 | 0.98 | 1.03 | | | | | | |
| | DASS Depression | | 0.25 | 0.07 | 0.24 | 3.63 | <0.001 | 0.35 | 2.85 | | 0.18 | 0.07 | 0.17 | 2.68 | 0.008 | 0.34 | 2.94 | | | | | | |
| | RIBS (items 5-8) | | 0.16 | 0.10 | 0.07 | 1.69 | 0.093 | 0.93 | 1.08 | | 0.04 | 0.16 | 0.01 | 0.24 | 0.808 | 0.94 | 1.06 | | | | | | |
| | ISS | | 0.00 | 0.04 | 0.00 | 0.02 | 0.983 | 0.16 | 6.15 | | -0.17 | 0.05 | -0.31 | -3.20 | 0.001 | 0.15 | 6.80 | | | | | | |
| | OASS | | 0.30 | 0.05 | 0.40 | 5.56 | <0.001 | 0.30 | 3.34 | | 0.54 | 0.06 | 0.64 | 8.59 | <0.001 | 0.25 | 4.07 | | | | | | |
| 6 ^a | SCS | 0.36 | 0.01 | 0.02 | 0.03 | 0.72 | 0.475 | 0.87 | 1.15 | 0.42 | -0.01 | 0.04 | -0.01 | -0.28 | 0.783 | 0.67 | 1.49 | | | | | | |
| | RSES | | 0.04 | 0.10 | 0.03 | 0.39 | 0.695 | 0.38 | 2.61 | | 0.21 | 0.15 | 0.11 | 1.41 | 0.159 | 0.25 | 4.07 | | | | | | |
| | SAFE | | 0.08 | 0.03 | 0.15 | 2.54 | 0.011 | 0.42 | 2.37 | | 0.17 | 0.04 | 0.31 | 4.50 | <0.001 | 0.28 | 3.54 | | | | | | |
| | (Constant) | | 11.26 | 4.25 | 2.65 | 0.008 | -3.30 | 6.03 | -0.55 | | 0.584 | | | | | | | | | | | | |
| | SIAS | | -0.05 | 0.04 | -0.07 | -1.17 | 0.244 | 0.38 | 2.61 | | -0.06 | 0.06 | -0.08 | -1.13 | 0.260 | 0.28 | 3.56 | | | | | | |
| | Age | | 0.04 | 0.04 | 0.04 | 0.96 | 0.336 | 0.83 | 1.21 | | 0.01 | 0.04 | 0.01 | 0.22 | 0.829 | 0.94 | 1.07 | | | | | | |
| | Gender (Male) | | -0.60 | 0.79 | -0.03 | -0.76 | 0.446 | 0.95 | 1.05 | | -1.10 | 1.35 | -0.03 | -0.82 | 0.414 | 0.98 | 1.02 | | | | | | |
| | DASS Depression | | 0.25 | 0.06 | 0.24 | 3.91 | <0.001 | 0.41 | 2.47 | | 0.12 | 0.07 | 0.11 | 1.79 | 0.075 | 0.37 | 2.67 | | | | | | |
| RIBS (items 5-8) | 0.16 | 0.09 | 0.07 | 1.69 | 0.092 | 0.93 | 1.08 | 0.11 | 0.16 | 0.03 | 0.68 | 0.497 | 0.96 | 1.04 | | | | | | | | | |
| 6 ^a | OASS | 0.36 | 0.30 | 0.04 | 0.40 | 7.15 | <0.001 | 0.49 | 2.03 | 0.42 | 0.45 | 0.06 | 0.54 | 7.90 | <0.001 | 0.30 | 3.30 | | | | | | |
| | SCS | | 0.01 | 0.02 | 0.03 | 0.72 | 0.474 | 0.88 | 1.14 | | -0.01 | 0.04 | -0.01 | -0.23 | 0.820 | 0.67 | 1.49 | | | | | | |
| | RSES | | 0.04 | 0.10 | 0.02 | 0.41 | 0.681 | 0.44 | 2.29 | | 0.39 | 0.14 | 0.20 | 2.81 | 0.005 | 0.29 | 3.48 | | | | | | |
| | SAFE | | 0.08 | 0.03 | 0.15 | 2.55 | 0.011 | 0.42 | 2.36 | | 0.15 | 0.04 | 0.28 | 4.06 | <0.001 | 0.29 | 3.47 | | | | | | |

DASS, Depression Anxiety Stress Scales; GPTS, Green Paranoid Thought Scales; ISS, Internalised Shame Scale; OASS, Other As Shamer Scale; RIBS, Reported and Intended Behaviour Scale; RSES, Rosenberg Self-Esteem Scale; SAFE, Subtle Avoidance Frequency Examination; SCS, Social Comparison Scale; SIAS, Social Interaction Anxiety Scale.

^a Due to multicollinearity, ISS was removed from the model 5.

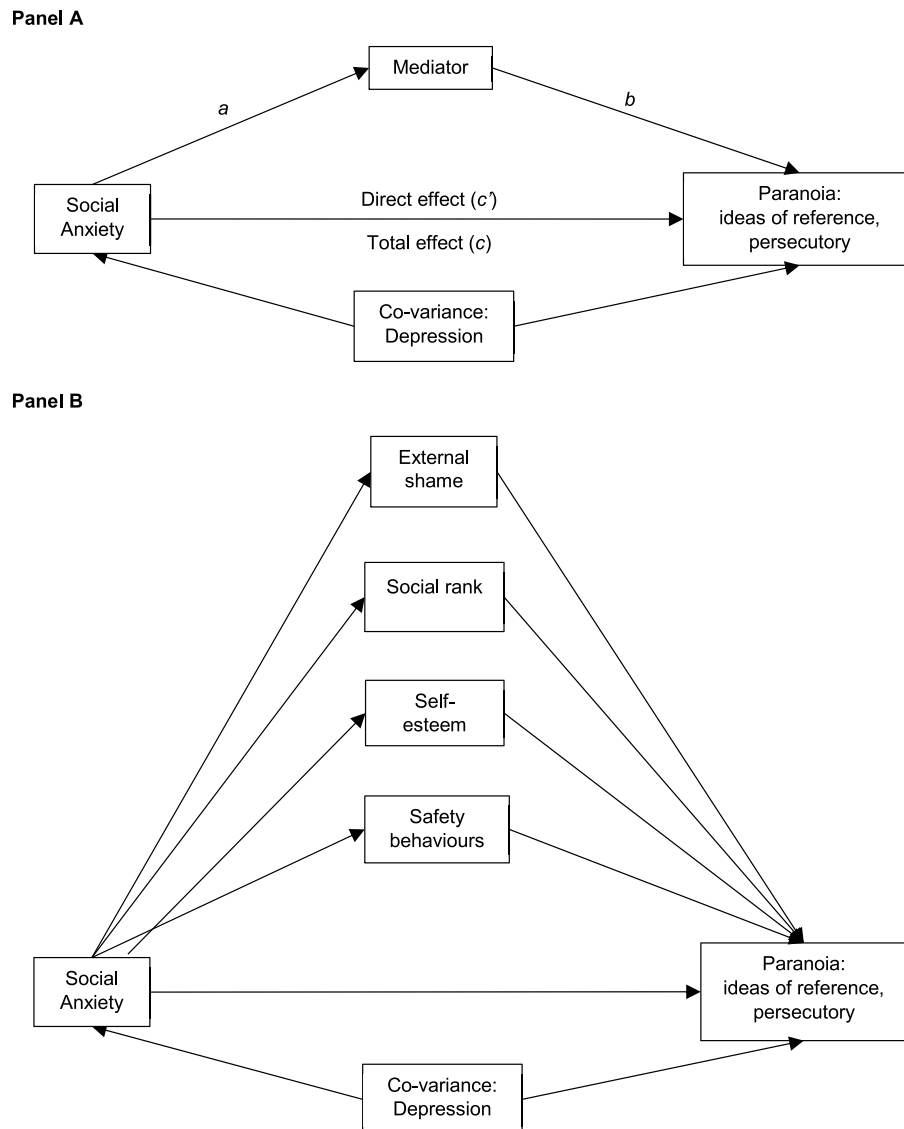


Fig. 1. The simple (panel A) and multiple (panel B) mediation model of the social anxiety having direct effect towards paranoia (ideas of reference, persecutory), with covarying for depression, and mediated by external shame, social rank; self-esteem or safety behaviour factors (stigma and internal shame were removed from the multiple mediation model, due to no associations with hypothesised factors and multicollinearity, respectively).

the association between social anxiety and paranoia (including: IoR and persecutory) across Thailand and the UK. External shame was a significant mediator of the relationship between social anxiety and paranoid fears in both of the Thai and UK samples. Safety behaviours factor was a significant mediator in both countries, but not in the social anxiety-IoR relationship in Thailand. Another significant mediator was self-esteem in the UK sample only.

4.1. Differences of psychological factors due to cultural issues

The fact that the data were obtained from different cultural settings did not adversely affect the reliability of measurements, with internal consistency coefficients ranging from good to excellent in both countries. Notably, the percentage of people experiencing social anxiety in the UK was significantly higher than Thailand as well as which the mean and median of the UK sample were significantly higher for social anxiety, depression and potential mediators (i.e., internal and external shame and safety behaviours) and lower stigma, social rank and self-esteem compared to the Thai sample. When considering significant differences of variables across countries, it could be explained; firstly, that due to

many samples reporting a history of mental illness from the UK were higher than Thailand (74.9% vs 27.4%); and secondly, the UK sample perhaps had more severe, observed psychological distress; particularly depression (the largest mean difference accounted for 11.197), than the Thai sample. As a result of severe distress (stress, anxiety and depression), the UK sample could present high levels of socially anxious fears, internal and external shame, safety behaviours as well as lower self-esteem and social rank.

As for the stigma score, the UK sample reported better attitudes (less discrimination) towards people with mental illness than that of the Thai sample. Similarly, Eastern people reported more mental illness stigma than those from Western countries (Krendl and Pescosolido, 2020). Interestingly, only paranoia (either IoR or persecutory) had no significant difference between countries; according to median values. This is because general people may less discuss occurrences of suspicious thoughts that impact on a lack of recognition of paranoid experiences (Freeman et al., 2005).

With respect to cross-cultural issues, in individualistic cultures (e.g. UK, US) one's achievements and success received the greatest reward and social admiration which are valued as a sign of personal maturity;

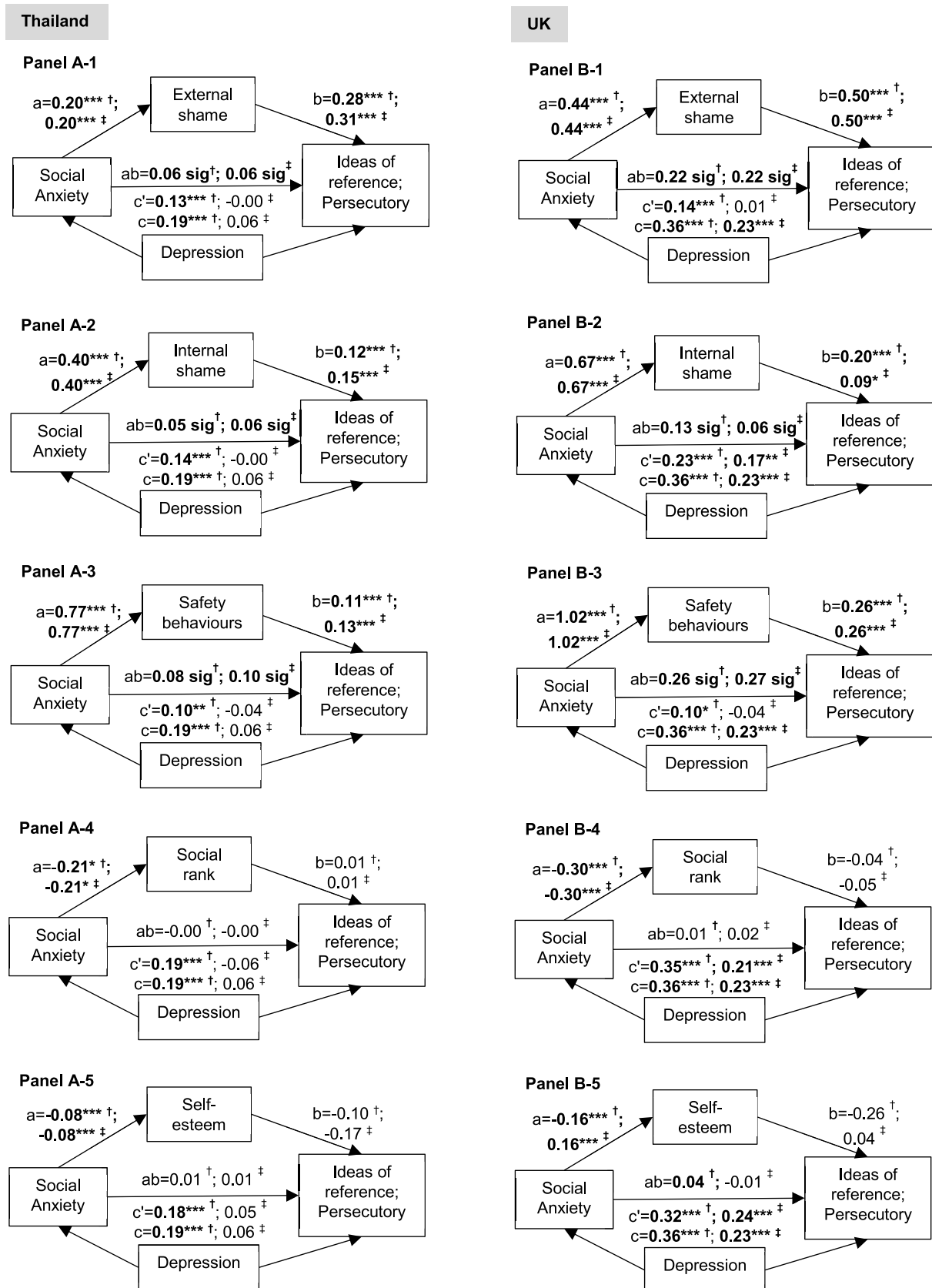


Fig. 2. The simple mediation model of the social anxiety having direct effect towards paranoia (ideas of reference or persecutory), with covarying for depression, and mediated by external shame, internal shame, safety behaviours, social rank and self-esteem factors, respectively, from Panel A-1 to A-5 (Thailand) and from Panel B-1 to B-5 (the UK).

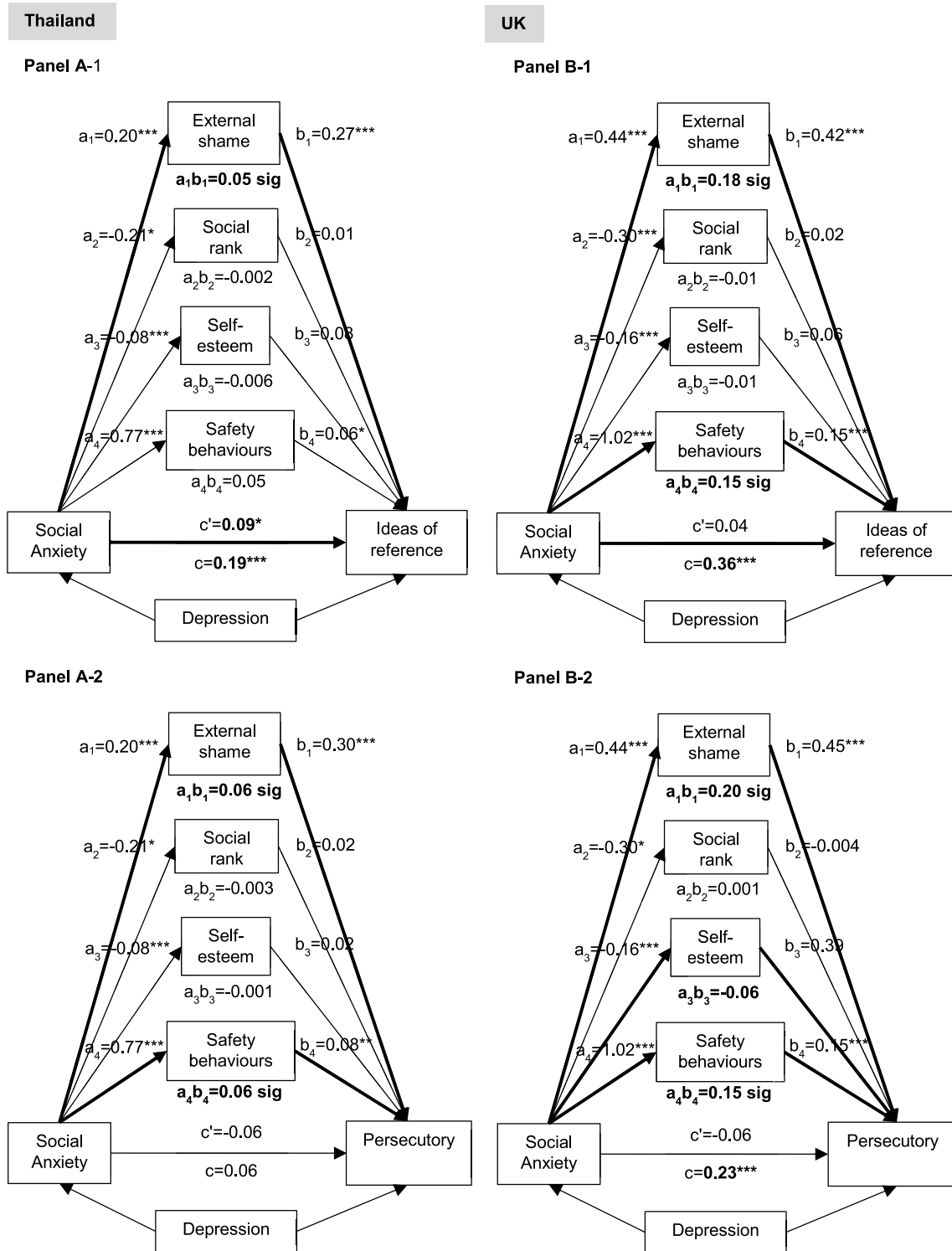


Fig. 3. The multiple mediation model of social anxiety having direct effect towards paranoia (ideas of reference or persecutory), with covarying for depression, and mediated by external shame, safety behaviours, social rank and self-esteem factors; for which Panel A-1 and B-1 for idea of reference and A-2 and B-2 for persecutory, of Thailand and the UK, respectively.

whereas, in collectivistic cultures (e.g., Thailand, Japan) shyness, inhibition and humility are flourished (Hofmann et al., 2010). To prevent failure individualists may have a higher focus on the self (e.g., self-criticism, self-appraisals) than that of the collectivists (Arimitsu et al., 2019). Regarding Buddhist/Confucian principles that influence Thai and Eastern culture, individuals could rely on self-decentness or mindfulness practice, allowing them to be aware of negative thoughts

and feelings without ruminating about personal struggles (mindfulness) and compassionate themselves in-the-moment experiences in a non-judgmental manner (Hwang, 2011; Kahn et al., 2017; Li et al., 2017). So, collectivists could be less distressed and suffered more from interpersonal worry than individualists. Therefore, these cultural valuations resulted in lower mean/median scores of social anxiety and other factors (e.g., shame, safety behaviours) amongst the Thai sample compared to

the UK sample. In addition, the prevalence of anxiety disorders of individuals from Indo-Asian cultures was found to be lower than those from Euro/Anglo cultures (Remes et al., 2016).

4.2. Testing hypothesis 1

Regarding the first hypothesis, a significant relationship between social anxiety and paranoia was found across both the Thai and UK samples. However, after controlling for depression, social anxiety remained significantly associated with IoR in both samples, but with persecutory only the UK sample. Because of a weak link existing between social anxiety and persecutory amongst the Thai sample ($\rho = 0.32$, $p < 0.01$), confounded by depression, an association of social anxiety with persecutory in Thailand was no longer significant. When using the hierarchical model with all potential variables, there were no longer significant associations between social anxiety and paranoia in both countries. Following removal of internal shame; due to multicollinearity, regression analyses revealed that external shame and safety behaviours significantly linked paranoia; including, IoR and persecutory amongst both the Thai and UK samples. Thus far, we found cross-cultural evidence confirming the link of social anxiety and paranoia amongst the non-Western population, this could be an entry to help generalize the use of theoretical knowledge to Asian populations (Naem et al., 2019).

4.3. Testing hypothesis 2

The second hypothesis was tested with simple and multiple mediation analyses. In simple analyses, (internal and external) shame appraisals along with safety behaviours factors significantly mediated social anxiety-paranoia processes in both samples; self-esteem was also significant but only in the UK. In the multiple mediation analysis, external shame was the only robust mediator showing significant, indirect effect in both processes of social anxiety and IoR/persecutory across countries. Safety behaviours were another potential mediator; however they were not significant in the social anxiety-IoR process in the Thai sample. Again, self-esteem showed a significant, indirect effect only in the UK. Sensitivity analyses (post-hoc analyses) allowed us to confirm the consistency of our findings. External shame and safety behaviours retained a significant, indirect effect amongst both countries; whereas, self-esteem was confirmed to be a significant mediator only in the UK.

4.4. Associations of shame into social anxiety and paranoia

Considering evolutionary perspectives, the primordial social environment likely drove the emergence of the capacity to experience negative self-appraisals, based on the anticipated content of other minds. Social animals have likely evolved repertoires of anxious behaviour based on anticipated behaviour of others; particularly dominant, higher ranking individuals (Gilbert, 2014). This anxiety has been called paranoia anxiety, which is more primitive (phylogenetically earlier) than social anxiety that requires a sense of self and an awareness of how we might exist in the minds of others (Gilbert, 2014). Paranoia is linked more to potential physical harm; whereas social anxiety is linked more to attack reputation and social standing (Freeman et al., 2005; Gilbert, 2014). Additionally, previous studies found strong associations of shame with social anxiety (Gilbert, 2000; Gumley et al., 2004; Michail et al., 2017) and paranoia (Freeman et al., 2005; Gilbert et al., 2005). Notably, this study supports evidence from previous observations that shameful experiences are significantly linked to the social anxiety-paranoia relationship. External shame sounds to be, potentially, a key mechanism in the association of social anxiety with paranoia. This is consistent with a recent longitudinal study (Aunjitsakul et al., 2022). It could be explained that negative concerns on the mind of others (external shame) closely relates to interpersonal threats, due to being negatively evaluated by others (Freeman et al., 2005). Thereby, external shame is more associated with paranoia than internal shame (Matos et al., 2013).

Because the evolution of shame capacities in humans most probably pre-dating the emergence of cultural differentiation, this pattern of sensitivity to social shame is seen across cultures (Sznycer et al., 2016, 2018). Thus, our findings suggested that shame related cognitions, particularly external shame, could potentially explain social anxiety and paranoia in non-clinical populations, and across the range of severity (e.g., ultra-high risk psychosis or established psychosis) (Aunjitsakul et al., 2021) cross-culturally.

4.5. Importance of safety behaviours and self-esteem

The other two factors – safety behaviours and self-esteem – significantly mediated the relationship between social anxiety and paranoia; although no consistent outcomes were found. Regarding the measurement effect on safety behaviours, it may cause lowering mean/median scores amongst the Thai sample. This is because five items (of concealing physical symptoms) of SAFE were unable to represent symptoms in a Thai context; such as, saying: ‘it’s hot’ to explain sweating or blushing’ or ‘wear cool clothes to prevent sweating’, this could influence the sample to report a lower score, due to the topical climate within the Thai setting. These items reflect individuals’ concerns about visible, autonomic symptoms (Cuming et al., 2009), which may be affected by the variation of weather; thus, these might be culturally sensitive, based on the concealing symptoms. Furthermore, although SAFE has been performed translation method, validity analysis has not been conducted in Thailand. Thus, careful interpretation of SAFE is advised. As defensive behaviours are frequently used amongst people with social anxiety or paranoia to prevent them from anxiety-provoking social situations (Clark and Wells, 1995; Freeman et al., 2007) and that there is promising evidence of self-esteem that negative feelings about the self relates to social anxiety (Gilbert, 2000; Gumley et al., 2004; Lecomte et al., 2019; Roe, 2001; Smith et al., 2006) and paranoia (Gilbert et al., 2005), it thus requires further investigations to explain the social anxiety-paranoia relationship.

4.6. Inconclusive findings of stigma and social rank to be further explored

As for insignificant results of hypothesised factors (i.e., stigma and social rank); firstly, although the stigma tool – RIBS – is feasible, with good psychometric properties, it is partly limited due to a lack of definitions and perceptions of mental health, it also has no specific circumstances of each experience (Evans-Lacko et al., 2011). Because of this, RIBS then failed to measure stigma experiences of both the Thai and UK samples, resulting in no significant associations of stigma with other potential factors. However, RIBS reflect discriminative experiences by using general people’s perspective towards people with mental illness (namely public stigma). Individuals that vulnerable to social/public judgement, particularly those with mental illness, may increase awareness and be less against those with mental disorder in terms of intended behaviours perspective. This help explains the significant difference in stigma in the two samples that the majority in the UK sample being people with a mental history had lower stigmatising attitude or behaviours towards people with mental health problems. Secondly, our result showed that social rank appraisals were not able to explain the associations of social anxiety and paranoia. It could be that social rank appraisals are complex in regards to paranoia, as mentioned earlier in the introduction. Additionally, low social rank appraisals may be affected by the major proportion of females and the social phobia group of this study (Gilbert et al., 2005).

4.7. Strengths and limitations

To our knowledge, this is the first study surveying factors involved in the hierarchy of social anxiety through to paranoia across two cultural contexts. The strengths of this study are as follows: this is a cross-cultural study investigating potential factors amongst non-Western and Western settings. So, two distinctive, different samples from different contexts were used to test the robustness of mediator outcomes. A large number of

Table 5
Results of simple and multiple mediation analyses examining direct, indirect and total effects of independent variable (social anxiety) and dependent variables (GPTS reference), with co-variances (DASS Depression) through mediators compared between Thailand (n = 427) and the UK (n = 415).

| Countries Independent variables | Mediators | TH | | Indirect effect (ab) | Bootstrapping bias-corrected 95% CI | Direct effect (c) | Total effect (c) | UK | | Indirect effect (ab) | Bootstrapping bias-corrected 95% CI | Direct effect (c) | Total effect (c) |
|---------------------------------|-----------|--------------------------------|--------------------------------|----------------------|-------------------------------------|-------------------|------------------|--------------------------------|--------------------------------|----------------------|-------------------------------------|-------------------|------------------|
| | | Effect of SIAS on mediator (a) | Effect of SIAS on mediator (b) | | | | | Effect of SIAS on mediator (a) | Effect of SIAS on mediator (b) | | | | |
| Simple mediation analysis | ISS | 0.40*** | 0.12*** | 0.05 | 0.018, 0.086 | 0.14*** | 0.19*** | 0.67*** | 0.13 | 0.081, 0.190 | 0.23*** | 0.36*** | |
| | OASS | 0.20*** | 0.28*** | 0.06 | 0.031, 0.089 | 0.13*** | 0.19*** | 0.44*** | 0.22 | 0.165, 0.275 | 0.14*** | 0.36*** | |
| | SCS | -0.21* | 0.01 | -0.003 | -0.012, 0.004 | 0.19*** | 0.19*** | -0.30*** | 0.01 | -0.009, 0.035 | 0.35*** | 0.36*** | |
| | RSES | -0.08*** | -0.10 | 0.01 | -0.006, 0.025 | 0.18*** | 0.19*** | -0.16*** | 0.04 | 0.003, 0.079 | 0.32*** | 0.36*** | |
| Multiple mediation analysis | SAFE | 0.77*** | 0.11*** | 0.08 | 0.026, 0.143 | 0.10** | 0.19*** | 1.02*** | 0.26 | 0.188, 0.338 | 0.10* | 0.36*** | |
| | OASS | 0.20*** | 0.27*** | 0.05 | 0.027, 0.089 | 0.09* | 0.19*** | 0.44*** | 0.18 | 0.129, 0.244 | 0.04 | 0.36*** | |
| | SCS | -0.21* | 0.01 | -0.002 | -0.011, 0.004 | | | -0.30*** | -0.01 | -0.028, 0.013 | | | |
| | RSES | -0.08*** | 0.08 | -0.006 | -0.021, 0.010 | | | -0.16*** | -0.01 | -0.049, 0.031 | | | |
| | SAFE | 0.77*** | 0.06* | 0.05 | -0.008, 0.111 | | | 1.02*** | 0.15 | 0.083, 0.227 | | | |

DASS, Depression Anxiety Stress Scales; GPTS, Green Paranoid Thought Scales; OASS, Other As Shamer Scale; RSES, Rosenberg Self-Esteem Scale; SAFE, Subtle Avoidance Frequency Examination; SCS, Social Comparison Scale; SIAS, Social Interaction Anxiety Scale *p < 0.05, **p < 0.01, ***p < 0.001.

calculated participants from each country (n = 400) were met, which helped reduce the possibility of a Type II error. Post-hoc power analyses were performed and the study showed sufficient sample sizes to achieve adequate power (Supplementary Table 7). Good to excellent reliability of rated measurements in both countries were found. Additionally, the robustness of mediator outcomes was confirmed by using sensitivity analyses.

There were a few limitations. Firstly, there was an unobserved population who were unable to access the internet from electronic devices. That study used an internet-based approach, which undermined the generalizability in terms of representativeness for the entire population (Grewenig et al., 2018; Groves et al., 2004). Nor were we able to recruit nationally representative samples in each country. We primarily intended to examine the generalizability of mediator outcomes, rather than proportional representation. So far, our survey reached the target sample size (calculating based on the prevalence of social anxiety), for which this amount exceeded the calculated sample size, based on the mediation analysis. Accordingly, our collected sample size was large enough to be confident that mediators (external shame) are likely to be a key mechanism linking social anxiety and paranoia. Secondly, there was a major proportion of females, people with a history of mental health problems and people with jobs related to health care, reflecting a lack of broader sample representativeness or leading to population bias; which adversely impacts generalising any of these differences between samples to the greater population. Given a convenience sample, it could be that the survey topic related to mental health is on respondents' interests, which motivated participation (Groves et al., 2004), although we carefully advertised the survey in various channels through social media and posters. Owing to a high number of those with a history of mental health problems and jobs related to health care, the results may help shed some light on individuals with more severe conditions, although this was not our primary intention. Thirdly, another limitation is strong associations of internal shame with other variables, causing multicollinearity in data analyses. One potential resolution that could be undertaken in future analyses is Principal Component Analysis to identify underlying latent constructs, and to test these in mediation analyses. Our cross-cultural data provided consistent evidence of the reliability of measurements and the mediator outcomes, this may help to explain transformation of social anxiety into psychotic experiences. However, our findings cannot explain temporal relationship with social anxiety and paranoia, due to cross-sectional research.

4.8. Research implications

Our findings found that external shame, safety behaviours and self-esteem factors mediated the relationship of social anxiety and paranoia. Importantly, similarities of mediating effects of external shame from Thailand and the UK transferred cross-cultural contexts are relevant to understanding mechanisms of social anxiety interacting with paranoia. Our results help elucidate some clues to guide the development of psychological interventions by focusing more on shameful experiences and safety behaviours in psychosis (Michail et al., 2017; Michail et al., 2017) and self-esteem. However, the data being drawn from a non-clinical population should be carefully interpreted.

Regarding treatment application, CBT should be tailored for specific treatment of social anxiety/paranoia symptoms, by targeting shame appraisals and safety behaviours. Cultural issues should be further considered to individually address suitable psychological techniques for people from difference cultural beliefs. For examples: individualists often evaluated themselves based on social admiration or life achievements, this may impact shame experiences and cause more distress than collectivists. By targeting shame factors, therapists should be aware of their clients' cultures to individually approach and use appropriate treatment for them. Furthermore, individualists generally adhere to logical explanation and self-criticism, rather than emotional reasoning and self-complacency (of collectivists); thus, cognitive restructuring techniques may have a

Table 6
Results of simple and multiple mediation analyses examining direct, indirect and total effects of independent variables (social anxiety) and dependent variables (GPTS persecutory), with co-variances (DASS Depression) through mediators compared between Thailand (n = 427) and the UK (n = 415).

| Countries Independent variables | Mediators | TH | | UK | | Total effect (c) | Direct effect (c') | Indirect effect (ab) | Bootstrapping bias-corrected 95% CI | Total effect (c) | |
|---------------------------------------|-----------|--------------------------------------|-------------------------------------|--------------------------------------|-------------------------------------|------------------------|--------------------------|-------------------------|---|---------------------|---------|
| | | Effect of SIAS on mediator (a) | Unique effect of mediator (b) | Effect of SIAS on mediator (a) | Unique effect of mediator (b) | | | | | | |
| Simple mediation analysis | ISS | 0.40*** | 0.15*** | 0.67*** | 0.09* | 0.06 | -0.00 | 0.06 | 0.005, 0.124 | 0.17*** | 0.23*** |
| | OASS | 0.20*** | 0.31*** | 0.44*** | 0.50*** | 0.06 | -0.00 | 0.06 | 0.158, 0.287 | 0.01 | 0.23*** |
| | SCS | -0.21* | 0.01 | -0.30*** | -0.05 | 0.06 | 0.06 | 0.02 | -0.006, 0.041 | 0.21*** | 0.23*** |
| | RSES | -0.08*** | -0.17 | 0.16*** | 0.04 | 0.05 | 0.05 | 0.05 | -0.049, 0.034 | 0.24*** | 0.23*** |
| Multiple mediation analysis | SAFE | 0.77*** | 0.13*** | 1.02*** | 0.26*** | 0.06 | -0.04 | 0.27 | 0.184, 0.365 | -0.04 | 0.23*** |
| | OASS | 0.20*** | 0.30*** | 0.44*** | 0.45*** | 0.06 | -0.06 | 0.06 | 0.135, 0.265 | -0.06 | 0.23*** |
| | SCS | -0.21* | 0.02 | -0.30*** | -0.004 | 0.06 | -0.003 | 0.001 | -0.021, 0.024 | 0.01 | 0.23*** |
| | RSES | -0.08*** | 0.02 | -0.16*** | 0.39 | 0.06 | -0.001 | -0.06 | -0.109, -0.018 | -0.06 | 0.23*** |
| | SAFE | 0.77*** | 0.08** | 1.02*** | 0.15*** | 0.06 | 0.06 | 0.15 | 0.072, 0.244 | -0.06 | 0.23*** |

DASS, Depression Anxiety Stress Scales; GPTS, Green Paranoid Thought Scales; OASS, Other As Shamer Scale; RSES, Rosenberg Self-Esteem Scale; SAFE, Subtle Avoidance Frequency Examination; SCS, Social Comparison Scale; SIAS, Social Interaction Anxiety Scale *p < 0.05, **p < 0.01, ***p < 0.001.

greater role for individualists, while compassion may be more appropriate for collectivists.

Another aspect to discuss, is why the mean/median of the factors in Thailand differs from the UK, regardless of consideration for collectivistic versus individualistic cultures, Buddhist practices that have long been influenced the way of life in Thai cultures should be considered. These are mindfulness and acceptance, which are central components within the Buddhist tenet. Mindfulness helps one to view the world in a way that is not fettered by personal judgements, prejudices or opinions. By being non-judgmental, one is able to be harmonious with his/her social context and develop an awareness of how things are (e.g., people (just) looking at me), rather than how one thinks things should be (e.g., they (definitely) hate me) (Hwang, 2011; Kahn et al., 2017). Regarding acceptance, it helps to reduce distress by allowing oneself to willingly accept (e.g., it's fine if they do not like me) and be less attached to the ideas of ridding oneself of painful experiences (e.g., why they do not like me or I look weird in their eyes) (Nagayama Hall et al., 2011). The Buddhist practices sound intuitively appealing for the application of psychological management in Asian or Thai people. Extracting Buddhist tenets to apply with intervention is therefore suggested.

For instance, it is evidenced that Compassion Focused Therapy (CFT) has a role to help foster and soothe internal experiences to be safe and warm from shame experiences (Castilho et al., 2019), and reassure themselves in a supportive way (Brown et al., 2020). Additionally, CFT improves emotional distress and social-related concerns in psychosis (Braehler et al., 2013). Buddhist tradition claims that compassion for all beings is characterized as a mental capacity that empowers all positive states of mind as we awaken to our fullest potential. This capacity could be proved as universal by improving assessment of the state-level effects of compassion (Arimitsu et al., 2019). Thus, we encourage the promotion of CFT to help individuals who suffer from social anxiety and paranoia, so as to develop acceptance and compassion relationships with themselves, in regards to shame cognitions (Brown et al., 2020) cross-culturally.

4.9. Future directions

The next phase of study is warranted to either confirm or disconfirm the speculation of our findings (i.e., external shame, safety behaviours and self-esteem) in clinical populations. This study failed to examine stigma and safety behaviours, despite that they could play a role in understanding social anxiety and paranoia in psychosis (Aunjitsakul et al., 2021); hence, both factors should be repeated. Additionally, although we thoroughly investigated several factors, we failed to notice other important factors related to social anxiety in psychosis. There are traumatic/bullying experiences (Lopes, 2013; Matos et al., 2013) and perceptual anomalies (Freeman et al., 2008) associated with paranoia thoughts, or loneliness/social exclusion (Lim et al., 2018) and compassion (Brown et al., 2020), which require more research attention. As discussed above, the Buddhist principles seem to affect concepts of self and others values including the factors in associated with social anxiety and paranoia. However, these cultural values were not measured in the current study, future research should capture these values.

5. Conclusion

In conclusion, our cross-cultural evidence highlighted that higher social anxiety was significantly related to higher paranoia through the shame cognitions; particularly external shame. Safety behaviours and self-esteem were also significant mechanisms, but their significant indirect effects were not consistent across countries. The potential factors in social anxiety with psychosis remain to be investigated in longitudinal research.

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Ethical standards

The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975; as revised in 2008.

Authors contributions

WA, HM and AG designed the study. WA collected data. WA, HM and AG undertook statistical analyses. WA wrote the first draft of the manuscript. All authors contributed to and have approved the final manuscript.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

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