Cognitive Therapy and Research
https://doi.org/10.1007/s10608-021-10219-3

ORIGINAL ARTICLE

Understanding the Dynamic Interaction of Maladaptive Social-Evaluative Beliefs and Social Anxiety: A Latent Change Score Model Approach

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Accepted: 25 March 2021

Abstract

Background There is a paucity of research that has examined the dynamic relationship between maladaptive social-evaluative beliefs and social anxiety. Thus, this study aimed to use latent change score models to examine changes in three theory-driven maladaptive social-evaluative belief types (i.e., conditional, unconditional, and high standard beliefs) and their relationship with social anxiety changes in the real-world, day-to-day life contexts of a community sample of individuals with elevated social anxiety ($N=73$).

Methods Individuals completed one daily assessment of the three belief types and social anxiety symptoms over 4 days.

Results Only the measures of social anxiety, unconditional beliefs, and high standard beliefs were found to have invariant measurement properties across time. As such, latent change score models were only examined for these measures. These models ultimately showed that greater increases in high standard beliefs predicted greater increases in social anxiety the subsequent day. Additionally, greater increases in social anxiety predicted smaller increases or declines in high standard beliefs the next day. Changes in unconditional beliefs were unrelated to social anxiety changes the next day, and changes in social anxiety were unrelated to next day changes in unconditional beliefs.

Conclusions These findings suggest high standard beliefs play a prominent role in the dynamics involving social anxiety and provide a basis for future research to further understand the interaction between these constructs.

Keyword Social anxiety · Social anxiety disorder · Maladaptive social-evaluative beliefs · Latent change score models · Latent difference score models

This study was supported by a National Health and Medical Research Council Early Career Fellowship (APP1037618) awarded to Quincy J. J. Wong. Alexandre Heeren was supported by the FRS-FNRS Belgian National Science Foundation (as FRS-FNRS research associate).

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Introduction

Social anxiety disorder (SAD) is a debilitating mental disorder characterised by a fear of evaluation from others and avoidance of social-evaluative situations. In key psychological models of SAD, social-evaluative situations trigger maladaptive social-evaluative beliefs, which in turn trigger anxiety as well as problematic cognitive and behavioural processes that ultimately maintain the beliefs and the disorder (Clark & Wells, 1995; Hofmann, 2007; Rapee & Heimberg, 1997; for a review, see Wong & Rapee, 2016). In this way, as long as social-evaluative situations are encountered, maladaptive social-evaluative beliefs and an anxiety response should fluctuate over time in correspondence with these situations. Of note, Clark and Wells (1995) proposed that maladaptive social-evaluative beliefs held by individuals with SAD can be categorised as: conditional beliefs (which highlight negative social outcomes if some perceived social

Published online: 08 April 2021

criterion is met by the individual; e.g., "If I make mistakes others will reject me"), unconditional beliefs (which highlight perceived evaluation from others as an absolute; e.g., "People think I'm boring"), and high standard beliefs (which highlight perceived excessive social criteria that need to be met; e.g., "I have to convey a favourable impression"). These theoretical descriptions raise the possibility of the maladaptive belief types dynamically interacting with social anxiety, such that the beliefs might influence social anxiety, and social anxiety might influence the beliefs. The current study aimed to empirically examine these dynamic relationships.

In the literature, there has been variation in how maladaptive social-evaluative beliefs have been conceptualised and measured (for reviews, see Gregory & Peters, 2017; Wong et al., 2016). It is noteworthy as well that in contrast to prominent SAD models (e.g., Clark & Wells, 1995), most of these works have viewed maladaptive social-evaluative beliefs as a whole, unified construct, without distinguishing the three assumed types. Despite this, some broad patterns of findings concerning maladaptive social-evaluative beliefs, in general, are evident. Studies with cross-sectional research designs have shown that maladaptive social-evaluative beliefs are positively associated with social anxiety (e.g., Fergus et al., 2009; Gros & Sarver, 2014; Levinson et al., 2015; Wong et al., 2014). Furthermore, studies with analyses examining changes in maladaptive social-evaluative beliefs following cognitive-behavioural therapy (CBT) for patients with SAD have shown pre- to post-treatment decreases in these beliefs (e.g., Boden et al., 2012; Gros & Sarver, 2014; Koerner et al., 2013; Mörtberg et al., 2015; Moscovitch et al., 2015; Niles et al., 2014; Wong et al., 2017).

Research has also examined treatment-related changes in maladaptive social-evaluative beliefs and the relationship with social anxiety. In samples of patients with SAD, pre- to post-treatment decreases in maladaptive social-evaluative beliefs predicted fewer SAD symptoms at post-treatment (Koerner et al., 2013; Niles et al., 2014) as well as pre- to post-treatment decreases in SAD symptoms (Wong et al., 2017). Along similar lines, pre- to post-treatment reductions in maladaptive social-evaluative beliefs mediated pre- to post-treatment decreases in SAD symptoms for patients with SAD (Boden et al., 2012). Interestingly, the Boden et al. (2012) study also showed that pre- to post-treatment reductions in SAD symptoms mediated pre- to post-treatment decreases in maladaptive social-evaluative beliefs. However, this effect was weaker than the effect with maladaptive social-evaluative beliefs as the mediator.

Only a few studies have examined the dynamics of maladaptive social-evaluative beliefs and SAD symptoms with greater temporal resolution. In a sample of 29 adults with SAD undertaking a 16-week course of individual cognitive therapy (without follow-up), Mörtberg et al. (2015) used multilevel modelling and found that weekly changes in maladaptive social-evaluative beliefs did not predict subsequent changes in SAD symptoms, and weekly changes in SAD symptoms did not predict subsequent changes in maladaptive social-evaluative beliefs. However, Mörtberg et al. (2015) did find that maladaptive social-evaluative belief changes positively predicted concurrent SAD symptom changes across treatment, and interpreted these results to mean that decreases in maladaptive social-evaluative beliefs have a relatively immediate effect on decreasing SAD symptoms. More recently, in a sample of 77 adults with SAD undertaking a 12 week course of group CBT (without follow-up), Gregory et al. (2018) used bivariate latent change score modelling and found that fortnightly changes in maladaptive social-evaluative beliefs positively predicted subsequent weekly changes in SAD symptoms. However, there was no evidence of the other directional pathway—i.e., changes in social anxiety symptoms did not predict future changes in maladaptive beliefs.

It is evident that the two studies of the dynamics of maladaptive social-evaluative beliefs and SAD symptoms have been limited to patients with SAD in the treatment-outcome context (Gregory et al., 2018; Mörtberg et al., 2015). Yet, Clark and Wells (1995) postulated a highly pivotal role for the three types of maladaptive social-evaluative beliefs in the development of social anxiety, and thus not confined to the maintenance of social anxiety in patients with SAD. In particular, from the perspective of Clark & Wells' model (1995), these problematic beliefs are assumed to render individuals with elevated social anxiety more likely to appraise social situations as more threatening than they actually are, thereby fostering social anxiety and ultimately leading to the onset of SAD. Clarifying the associations between these beliefs and social anxiety in a nonclinical sample is of critical interest as it may illuminate potential pathways to SAD.

Furthermore, the two existing studies have examined maladaptive social-evaluative beliefs as a unified construct, despite theoretical (e.g., Clark & Wells, 1995) and empirical (e.g., Heeren et al., 2020; Maurage et al., 2013; Turner et al., 2003; Wong et al., 2014) delineation of maladaptive social-evaluative belief types. Notably, several studies relying on latent factor analyses have confirmed that the three-type categorisation initially proposed by Clark and Wells (1995) outperformed a unified model of the maladaptive social-evaluative beliefs (e.g., Heeren et al., 2014; Maeda et al., 2017; Wong et al., 2021; Wong & Moulds, 2009, 2011a). Thus, extending Gregory et al. (2018) and Mörtberg et al. (2015), the current study aimed to examine changes in the three maladaptive social-evaluative belief types proposed by Clark and Wells (1995) and their relationship with changes in social anxiety in the real-world, day-to-day life contexts of a community sample of individuals with elevated social anxiety. Based on the description of maladaptive social-evaluative beliefs triggering anxiety in relation to social-evaluative situation in theoretical models (e.g., Clark & Wells, 1995), it is reasonable to assume that the relationship between the beliefs and anxiety would be evident on a daily timescale.

To achieve our study's aim, the current study relied on latent change score models within a structural equation framework. Latent changes score models have increasingly been used as a flexible approach to modelling change, and are appropriate for this study given their ability to model change in latent constructs over time as well as the dynamic relationships between those constructs (e.g., Ferrer & McArdle, 2010; Grimm & Ram, 2018; McArdle, 2009). In this way, the current study has a similar approach to modelling change on a conceptual level as Gregory et al. (2018) and Mörtberg et al. (2015), as each study models how changes in one latent construct are related to subsequent changes in another latent construct. We also note that latent change score models have a specific advantage over some other models of change (e.g., cross-lagged panel models) because of their ability to model these cross-construct 'changes to changes' relationships (Mund & Nestler, 2019).

Provided that this study is the first of its kind, one can formulate several sets of hypotheses. However, we placed weighting mainly on previous theory (e.g., Clark & Wells, 1995) and research using the same analytic approach (Gregory et al., 2018) and formulated predictions accordingly. As such, we predicted that daily changes in each of the belief types would equally and positively predict future daily changes in social anxiety, and that daily changes in social anxiety would be unrelated to future daily changes in each of the three belief types.

Method

Participants

There were 73 adult participants recruited from the Sydney community using online advertising (e.g., study advertisement on Facebook pages of different Sydney communities; Gumtree), word-of-mouth, and a university-based research participant recruitment platform. The advertisement for recruitment described a study examining the relationship between cognitions and mood over time. Table 1 shows the demographic and symptom levels of the sample. Participants received a small monetary reimbursement (AU$20) or, if they were eligible, course credit for their participation. Participants were required to have self-reported elevated social anxiety symptoms to be included in the study (see Measures section), so that the sample was analogous to a group of individuals with SAD (see Stopa & Clark, 2001). There were no exclusion criteria.

Measures

Social Phobia Inventory (SPIN; Connor et al., 2000). The 17-item SPIN assesses fear, avoidance, and physiological symptoms of social anxiety disorder experienced in the preceding week. Responses are provided on a 5-point Likert scale, ranging from 0 (Not at all) to 4 (Extremely). The SPIN has good reliability (see Table 1) and validity (Connor et al., 2000). The SPIN was used in the current study to determine participant eligibility. According to previous research (Connor et al., 2000), a SPIN score ≥ 19 indicates a positive screen for elevated social anxiety. Thus, all participants in the current study had a SPIN score ≥ 19.

Depression Anxiety Stress Scales – Depression subscale (DASS-D; Lovibond & Lovibond, 1995). The 21-item short version of the DASS assesses levels of depression, anxiety, and stress over the preceding week. Responses are provided on a 4-point Likert scale, ranging from 0 (Did not apply to me at all) to 3 (Applied to me very much, or most of the time). Only the 7-item depression subscale was used in the current study. Following Lovibond and Lovibond (1995), the depression subscale score was doubled to obtain the full DASS score equivalent. The DASS depression subscale has good internal consistency (see Table 1) and validity (Antony et al., 1998).

Mini-Social Phobia Inventory—Modified (MSPIN-M; Connor et al., 2001). The original 3-item MSPIN provides a brief assessment of social anxiety symptoms for the past week. The original MSPIN uses the same response scale as the full SPIN, and also has good reliability and validity (Weeks et al., 2007). The MSPIN was modified for the current study such that: (a) participants completing the items in the evening (see Procedure) were instructed to rate the items based on their experiences during the day, and (b) items were modified in a way so that they made more sense for a daily measure (e.g., "Being embarrassed or looking stupid are among my worse fears" was changed to "I was afraid of being embarrassed or looking stupid"). Preliminary psychometric properties of the MSPIN-M appear satisfactory (e.g., good internal consistency; see Table 1).

Self-Beliefs related to Social Anxiety scale—Modified (SBSA-M; Wong et al., 2014). The original 15-item SBSA assesses three types of maladaptive social-evaluative beliefs (conditional, unconditional, and high standard beliefs) proposed by Clark and Wells (1995) with three corresponding subscales. Participants rate how much they agree with each belief item at the time of administration of the SBSA using an 11-point Likert scale, ranging from 0 (Do not agree at all) to 10 (Strongly agree). The SBSA was modified for the current study such that the two items with the highest average factor loading for each of the three beliefs types based on previous psychometric studies (Wong & Moulds, 2011a; Wong et al., 2014) were administered to enable a brief daily

Table 1 Descriptive statistics for demographics and main variables

Variable	Sample ($N = 73$)	Cronbach's α	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Age in years, *M* (*SD*)	20.14 (3.19)	–															
Gender (female), *n* (%)	64 (88%)	–															
Country of birth (Australia), *n* (%)	54 (74%)	–															
Ethnicity (European), *n* (%)	37 (51%)	–															
SPIN, *M* (*SD*)	36.70 (9.80)	0.81															
DASS-D, *M* (*SD*)	17.04 (11.57)	0.93															
1. MSPIN-M T1, *M* (*SD*)	4.92 (2.83)	0.79	–														
2. MSPIN-M T2, *M* (*SD*)	4.43 (3.53)	0.89	0.52**	–													
3. MSPIN-M T3, *M* (*SD*)	3.48 (2.93)	0.84	0.30*	0.29*	–												
4. MSPIN-M T4, *M* (*SD*)	3.70 (2.96)	0.95	0.51**	0.57**	0.37**	–											
5. SBSA-M CON T1, *M* (*SD*)	10.32 (4.49)	0.71	0.54**	0.53**	0.34**	0.54**	–										
6. SBSA-M CON T2, *M* (*SD*)	9.18 (5.51)	0.87	0.46**	0.71**	0.42**	0.49**	0.81**	–									
7. SBSA-M CON T3, *M* (*SD*)	8.35 (5.28)	0.87	0.34**	0.57**	0.59**	0.36**	0.64**	0.85**	–								
8. SBSA-M CON T4, *M* (*SD*)	8.81 (5.23)	0.83	0.44**	0.62**	0.45**	0.63**	0.74**	0.81**	0.81**	–							
9. SBSA-M UNC T1, *M* (*SD*)	8.84 (5.44)	0.87	0.41**	0.57**	0.35**	0.45**	0.64**	0.68**	0.62**	0.56**	–						
10. SBSA-M UNC T2, *M* (*SD*)	8.07 (5.88)	0.89	0.38**	0.55**	0.39**	0.49**	0.62**	0.75**	0.61**	0.58**	0.87**	–					
11. SBSA-M UNC T3, *M* (*SD*)	7.28 (5.36)	0.85	0.26*	0.42**	0.55**	0.28*	0.55**	0.66**	0.78**	0.53**	0.82**	0.82**	–				
12. SBSA-M UNC T4, *M* (*SD*)	7.67 (5.73)	0.90	0.33*	0.49**	0.38**	0.52**	0.62**	0.69**	0.67**	0.69**	0.82**	0.91**	0.88**	–			
13. SBSA-M HS T1, *M* (*SD*)	9.78 (5.75)	0.88	0.29*	0.52**	0.36**	0.22	0.65**	0.73**	0.74**	0.67**	0.55**	0.44**	0.55**	0.40**	–		
14. SBSA-M HS T2, *M* (*SD*)	8.92 (6.18)	0.96	0.30*	0.55**	0.35**	0.23	0.60**	0.82**	0.78**	0.68**	0.44**	0.50**	0.54**	0.40**	0.85**	–	
15. SBSA-M HS T3, *M* (*SD*)	8.52 (5.59)	0.91	0.25*	0.47**	0.51**	0.31*	0.59**	0.75**	0.83**	0.75**	0.53**	0.42**	0.67**	0.49**	0.81**	0.86**	–
16. SBSA-M HS T4, *M* (*SD*)	9.04 (5.77)	0.89	0.27*	0.52**	0.50**	0.40**	0.65**	0.73**	0.80**	0.85**	0.48**	0.46**	0.55**	0.58**	0.79**	0.82**	0.90**

SBSA-M items used were as follows: conditional belief items: "If someone doesn't like me, it must be my fault", "If I don't get everything right, I'll get rejected"; unconditional belief items: "People think I'm inferior", "People don't respect me"; high standard belief items: "I must get everyone's approval", "I need to be liked by everyone". For the MSPIN-M and SBSA-M subscales, total scores (sum of item scores) were calculated for each timepoint and means for the sample are reported in the table

SPIN Social Phobia Inventory *DASS-D* Depression Anxiety Stress Scales—Depression subscale, *MSPIN-M* Mini Social Phobia Inventory—Modified, *SBSA-M* Self-Beliefs related to Social Anxiety scale—Modified, *CON* conditional beliefs, *UNC* unconditional beliefs, *HS* high standard beliefs, *T1* Time 1 (Day 1), *T2* Time 2 (Day 2), *T3* Time 3 (Day 3), *T4* Time 4 (Day 4)

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

6-item measure of the three belief types (see Table 1 for items). Preliminary psychometric properties of the SBSA-M appear satisfactory (e.g., good internal consistency for each subscale; see Table 1).

Procedure

Interested individuals contacted the researcher, and were emailed an online copy of the SPIN and DASS-D. Those who were eligible to participate based on their SPIN score were then emailed a link to an online information and consent form (those who were not eligible were thanked and informed they were not eligible for the study). All questionnaires of the study were completed on an online survey platform. Upon providing informed consent, participants completed an online demographics questionnaire. Participants then completed in the evening of the next day an online MSPIN-M and SBSA-M (Day 1). An online MSPIN-M and SBSA-M were completed again on each of the evenings of the next three consecutive days (Days 2, 3, and 4). Questionnaire completion in the 'evening' was considered valid if submitted online between 5 pm and 1 am.

Statistical analyses

Latent change score models within a structural equation modelling framework were fit using the R package "lavaan" (Rosseel, 2012). All models were estimated using the full information maximum likelihood estimator with robust (Huber-White) standard errors. This approach allowed all available data to be analysed and guarded against any non-normality in the data.

Prior to examining change models for prospective data, it is recommended that the measures used have invariant measurement properties across time to ensure the same constructs are being measured (e.g., Grimm & Ram, 2018). For each of the four measures in our study (MSPIN-M item set and three SBSA-M subscale item sets), we tested three models reflecting three essential levels of measurement invariance (Vandenberg & Lance, 2000): (a) a configural invariance model (same factor structure underlying items across timepoints), (b) a metric invariance model (items have equal factor loadings across timepoints), and (c) a scalar invariance model (item intercepts are equal across timepoints). For each of our measures, we proposed a configural invariance model where there was a single factor underlying administered items at each of the four timepoints, with the four factors allowed to correlate. The configural invariance model needed to demonstrate acceptable model fit (see model fit criteria below) before we progressed to test subsequent invariance models (metric, and then scalar) which involved adding further equality constraints to model parameters. Parameters in subsequent invariance models were deemed invariant across timepoints if there was only a decrease of 0.01 or less in the comparative fit index (CFI; Cheung & Rensvold, 2002), or if there was an increase in the CFI. Change in the CFI is the most commonly used index to evaluate measurement invariance models (see Putnick & Bornstein, 2016). If all three levels of measurement invariance are ultimately achieved, then changes across timepoints can be attributed to changes in the construct of interest, as the measurement properties of the measure administered are the same across time. We proceeded to examine latent change score models only for those measures that exhibited all three levels of measurement invariance.

Prior to examining univariate latent change score models, we examined plots of means for the total scores for each measure (that was measurement invariant) across time to understand their trajectories and conduct preliminary evaluations of whether latent change score models would appropriately capture these trajectories (see Table 1; see also Grimm et al., 2012). For example, the plots of means for measures all generally showed a decreasing linear trend that allowed the assumption of linearity for specific latent change score models to be met. Assuming measurement invariance is obtained, to determine the appropriate change model for the social anxiety construct and each of the three maladaptive beliefs constructs, we planned to fit three univariate latent change score models for each set of items (MSPIN-M item set and three SBSA-M subscale item sets): (a) a constant change model, where latent change scores are a function of a constant change component, s, with associated factor loadings α all fixed equal to 1 (reflecting global linear change over time), (b) a proportional change model, where latent change scores are proportional to the factor score at the previous timepoint such that coefficient β is the estimated proportional change parameter, and (c) a dual change model, where latent change scores are affected by the influences described in the constant change model and the proportional change model. Full details of these models are beyond the scope of this paper but can be ascertained from existing literature (e.g., Grimm et al., 2012; McArdle, 2009). The timing metric was based on the day of questionnaire completion. In all models tested, error variances of items within each timepoint were allowed to covary to account for non-random time-specific influences on items at each timepoint. Additionally, error variances for the same item across time were allowed to covary to account for item specific variance that is stable over time.

Once optimal univariate latent change score models were ascertained for each item set, these were then used to fit bivariate latent change score models for each MSPIN-M and SBSA-M subscale pair. Crucial to the current study, key parameters added to these bivariate latent change score models were cross-construct 'changes to changes' parameters (represented by ξ) describing how a latent change score for one construct at one time-point is associated with the latent change score for the other construct at the next time-point (see also Grimm et al., 2012). The bivariate latent change score models allowed comparison of the following conditions: (a) all cross-construct changes to changes parameters fixed to 0 (i.e., no changes to changes modelled), (b) social anxiety changes as a leading indicator of subsequent maladaptive belief changes, (c) maladaptive belief changes as a leading indicator of subsequent social anxiety changes, and (d) all changes to changes parameters concurrently estimated. The only other additions to the bivariate models were error variances of MSPIN-M and SBSA-M items within each timepoint were allowed to covary to account for non-random time-specific influences on both sets of items, and initial factor scores and constant change components (where evident in the model) were allowed to covary to account for associations between these factors (see Grimm et al., 2012).

To determine model fit, the following fit indices were used: the scaled χ^2 statistic (smaller values indicate better fit), the comparative fit index (CFI; values ≥ 0.90 suggest acceptable fit; higher values indicate better fit), the Tucker-Lewis Index (TLI; values ≥ 0.90 suggest acceptable fit; higher values indicate better fit), the root mean square error of approximation (RMSEA; values ≤ 0.10 suggest acceptable fit; lower values indicate better fit), Akaike's Information Criterion (AIC; lower values indicate better fit), and Bayesian Information Criterion (BIC; lower values indicate better fit). A less conservative cut-off for the RMSEA was used (0.10 rather than the more widely accepted 0.08) because in small samples ($N \leq 100$) the RMSEA tends to be elevated even for correctly specified models (Chen et al., 2008; Kenny et al., 2015). Furthermore, a null model appropriate to latent change score models was used for the calculation of the CFI and TLI (see Grimm & Ram, 2018). Models were compared using either a scaled χ^2 difference test based on Satorra (2000) when models were nested or the BIC when models were non-nested. For example, the constant change model and the proportional change model are each nested in the dual change model because the parameters of the two former models are a subset of the parameters in the dual change model, and so can be compared with the scaled χ^2 difference test. The constant change model and the proportional change model are not nested, and so can be compared with the BIC.

Results

Preliminary analyses

There was complete baseline data (SPIN and DASS-D). There was also complete daily questionnaire data (MSPIN-M and SBSA-M) for 255 out of the 292 possible datapoints (overall 87.33% completion rate; Day 1: 73/73 datapoints, Day 2: 60/73 datapoints, Day 3: 65/73 datapoints, Day 4: 57/73 datapoints). In terms of participants, 25 had missing data. Amongst these participants, 11 participants were considered to have dropped out of the study (2 participants with Day 2, 3, and 4 data missing; 3 participants with Day 3 and 4 data missing; 6 participants with Day 4 data missing), 9 participants had missing data for one of the days (either Day 2 or Day 3) but returned to complete questionnaires on all subsequent days, and 5 participants had missing data for Day 2, returned to provide data on Day 3, and then had missing data on Day 4. Items of the MSPIN-M and SBSA-M at all timepoints were examined for outlying scores (defined by absolute z-score > 3.29) and none were detected. Items of the MSPIN-M and SBSA-M at all timepoints had score distributions with skew and kurtosis values within normal limits (i.e., all absolute skew values < 3 and absolute kurtosis values < 8; Kline, 2011).

Measurement invariance models

Table 2 shows the measurement invariance models tested for the 3-item social anxiety measure and each of the 2-item maladaptive belief measures. For the social anxiety measure, the configural invariance model had satisfactory fit indices, thus establishing configural invariance. The subsequent metric invariance model tested led to an increase of 0.002 in the CFI and the scalar invariance model tested led to a further increase of 0.009 in the CFI, indicating metric and scalar invariance were achieved. It was possible therefore to examine latent change score models using the social anxiety measure.

For the conditional beliefs measure, the configural invariance model had satisfactory fit indices, and configural invariance was established. However, the metric invariance model led to a decrease of 0.015 in the CFI, indicating metric invariance was not achieved. As such, measurement invariance testing for the conditional beliefs measure did not proceed further, and it was not possible to examine latent change score models using the conditional beliefs measure.

For the unconditional beliefs measure, the configural invariance model had satisfactory fit indices, establishing configural invariance, and the metric invariance model did not lead to a change in the CFI, thus establishing metric invariance. The scalar invariance model led to a decrease of 0.007 in the CFI, indicating scalar invariance was achieved. Thus, it was possible to examine latent change score models using the unconditional beliefs measure.

For the high standard beliefs measure, the configural invariance model had satisfactory fit indices, thus establishing configural invariance. The subsequent metric invariance model tested led to a decrease of 0.008 in the CFI and the scalar invariance model tested led to a decrease of 0.010

Table 2 Measurement invariance models

	Social anxiety (MSPIN-M)			Conditional beliefs (SBSA-M)			Unconditional beliefs (SBSA-M)			High standard beliefs (SBSA-M)		
	Configural	Metric	Scalar	Configural	Metric	Scalar	Configural	Metric	Scalar	Configural	Metric	Scalar
scaled χ^2	62.37	67.87	70.63	5.12	17.14	–	3.60	6.72	19.64	6.02	13.56	26.45
df	48	54	60	6	9	–	6	9	15	6	9	15
p	0.080	0.097	0.164	0.529	0.047	–	0.731	0.666	0.186	0.421	0.139	0.034
CFI	0.960	0.962	0.971	1.000	0.985	–	1.000	1.000	0.993	1.000	0.992	0.982
TLI	0.945	0.954	0.968	1.000	0.953	–	1.000	1.000	0.987	1.000	0.976	0.966
RMSEA	0.066	0.061	0.050	0.000	0.098	–	0.000	0.000	0.062	0.006	0.083	0.099
AIC	2071.49	2063.57	2053.82	2100.64	2103.74	–	1992.48	1988.68	1989.295	2027.34	2027.92	2027.33
BIC	2167.69	2146.03	2122.53	2187.68	2183.91	–	2079.52	2068.85	2055.71	2114.38	2108.09	2093.76
ΔCFI	–	0.002[a]	0.009[b]	–	– 0.015[a]	–	–	0.000[a]	– 0.007[b]	–	– 0.008[a]	– 0.010[b]

Configural invariance models were established based on acceptable fit indices (see Method). Metric invariance models and scalar invariance models were established based on decreases in CFI of .01 or less (Cheung & Rensvold, 2002), or an increase in the CFI. Testing of each more restrictive level of measurement invariance only proceeded when lower levels of measurement invariance were established. Hence, the scalar invariance model for the conditional beliefs measure was not estimated because metric invariance was not achieved for the conditional beliefs measure. Preliminary testing of models showed for the measures of maladaptive beliefs that models required error variances of the same item at each of the timepoints to be correlated

MSPIN-M Mini Social Phobia Inventory—Modified, *SBSA-M* Self-Beliefs related to Social Anxiety scale—Modified, *df* degrees of freedom, *CFI* comparative fit index, *TLI* Tucker-Lewis index, *RMSEA* root mean square error of approximation, *AIC* Akaike's Information Criterion, *BIC* Bayesian Information Criterion

[a]Metric model compared to configural model

[b]Scalar model compared to metric model

in the CFI, indicating metric and scalar invariance were achieved. It was possible to examine latent change score models using the high standard beliefs measure.

Univariate Latent Change Score Models

Based on the measurement invariance models tested, the social anxiety, unconditional beliefs, and high standard beliefs measures demonstrated all three levels of measurement invariance. As such, univariate latent change score models were examined only for these measures.

Models for Social Anxiety

Table 3 shows fit statistics for the social anxiety models tested. An out of bounds estimate was encountered in the constant change model and the dual change model, and these models were thus eliminated as options. The proportional model had satisfactory fit indices, and was selected as the superior model (see Fig. 1).

The proportional change model indicated participants had an average latent social anxiety score of 1.34 ($SE = 0.10$, $p < 0.001$, 95% CI [1.15, 1.52]) at the first time point, and there was significant variation in latent social anxiety scores at the first time point ($\sigma^2 = 0.40$, $SE = 0.09$, $p < 0.001$, 95% CI [0.23, 0.57]), reflecting individual differences in baseline values. The proportional change parameter was significant and negative ($\beta = -0.09$, $SE = 0.03$, $p = 0.001$, 95% CI [– 0.15, – 0.04]), and indicated the average daily decrease in social anxiety level was 9% of the previous day's social anxiety level.

Models for Unconditional Beliefs

As shown in Table 3, the dual change model had an out of bounds estimate, and was eliminated as an option. Compared to the proportional change model, the constant change model had better fit indices in general and a better BIC when directly comparing the two models. The constant change model was selected as the superior model (see Fig. 2).

The constant change model indicated participants had an average latent unconditional beliefs score of 4.68 ($SE = 0.33$, $p < 0.001$, 95% CI [4.03, 5.32]) at the first time point, and there was significant variation in latent unconditional belief scores at the first time point ($\sigma^2 = 7.53$, $SE = 1.07$, $p < 0.001$, 95% CI [5.44, 9.62]), reflecting individual differences in baseline values. The constant change component indicated significant daily mean decreases (mean $s = -0.24$, $SE = 0.07$, $p = 0.001$, 95% CI [– 0.38, – 0.10]). There was non-significant variation in the constant change component ($\sigma^2 = 0.12$, $SE = 0.07$, $p = 0.091$, 95% CI [– 0.02, 0.26]). The covariance between latent unconditional belief scores at the first time point and the constant change component was not

Table 3 Univariate latent change score models

	Models for social anxiety			Models for unconditional beliefs			Models for high standard beliefs		
	Constant change model[b]	Proportional change model[a]	Dual change model[b]	Constant change model[a]	Proportional change model	Dual change model[b]	Constant change model[a]	Proportional change model	Dual change model
scaled χ^2	59.81	62.71	59.12	20.02	31.44	15.70	19.08	34.00	18.72
df	50	52	49	20	22	19	20	22	19
p	0.161	0.147	0.152	0.457	0.087	0.678	0.516	0.049	0.475
CFI	0.985	0.984	0.985	1.000	0.989	1.000	1.000	0.985	1.000
TLI	0.975	0.974	0.973	1.000	0.980	1.008	1.000	0.972	1.000
RMSEA	0.051	0.053	0.053	0.004	0.073	0.000	0.000	0.086	0.000
AIC	2059.78	2058.52	2061.41	1980.01	1985.96	1977.62	2012.61	2022.24	2011.95
BIC	2151.40	2145.55	2155.32	2034.98	2036.35	2034.88	2067.58	2072.63	2069.21

Preliminary testing of models showed that for all latent change score models, error variances of the same item at each of the timepoints needed to be correlated (to account for item specific variance that is stable over time). In addition, models required error variances of items within each timepoint to be correlated (to account for non-random time-specific influences on items at each timepoint)

df degrees of freedom, *CFI* comparative fit index, *TLI* Tucker-Lewis index, *RMSEA* root mean square error of approximation, *AIC* Akaike's Information Criterion, *BIC* Bayesian Information Criterion

[a]Selected model

[b]An estimate was out of bounds in this model

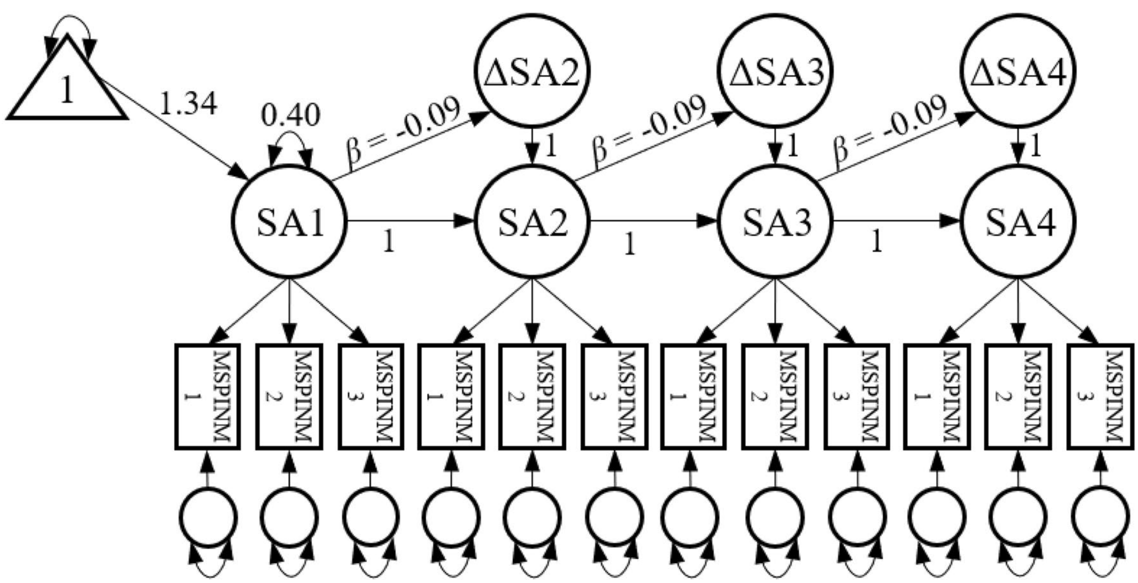

Fig. 1 Best-fitting univariate latent change score model (proportional model) for social anxiety changes over the four days. Only key parameters are shown for clarity. Rectangles represent observed variables, small circles represent error variances, large circles represent latent variables, and the triangle represents a constant. Single-headed arrows indicate either regression coefficients, or means. Double-headed arrows indicate variances. Error variances of items within each timepoint were allowed to covary and error variances of the same item at each timepoint were allowed to covary, but are not shown in the diagram for clarity. Item MSPINM1 = "Fear of embarrassment caused me to avoid doing things or speaking to people", item MSPINM2 = "I avoided activities in which I would have been the center of attention", and item MSPINM3 = "I was afraid of being embarrassed or looking stupid". The proportional change parameter ($\beta = -0.09$) was constrained to be equal over time. *SA* social anxiety, *ΔSA* change in social anxiety, *MSPINM* Mini Social Phobia Inventory–Modified

significant ($\sigma = -0.02$, $SE = 0.18$, $p = 0.927$, 95% CI [− 0.38, 0.34]).

Models for High Standard Beliefs

As shown in Table 3, the constant change model was a better fit when directly compared with the proportional

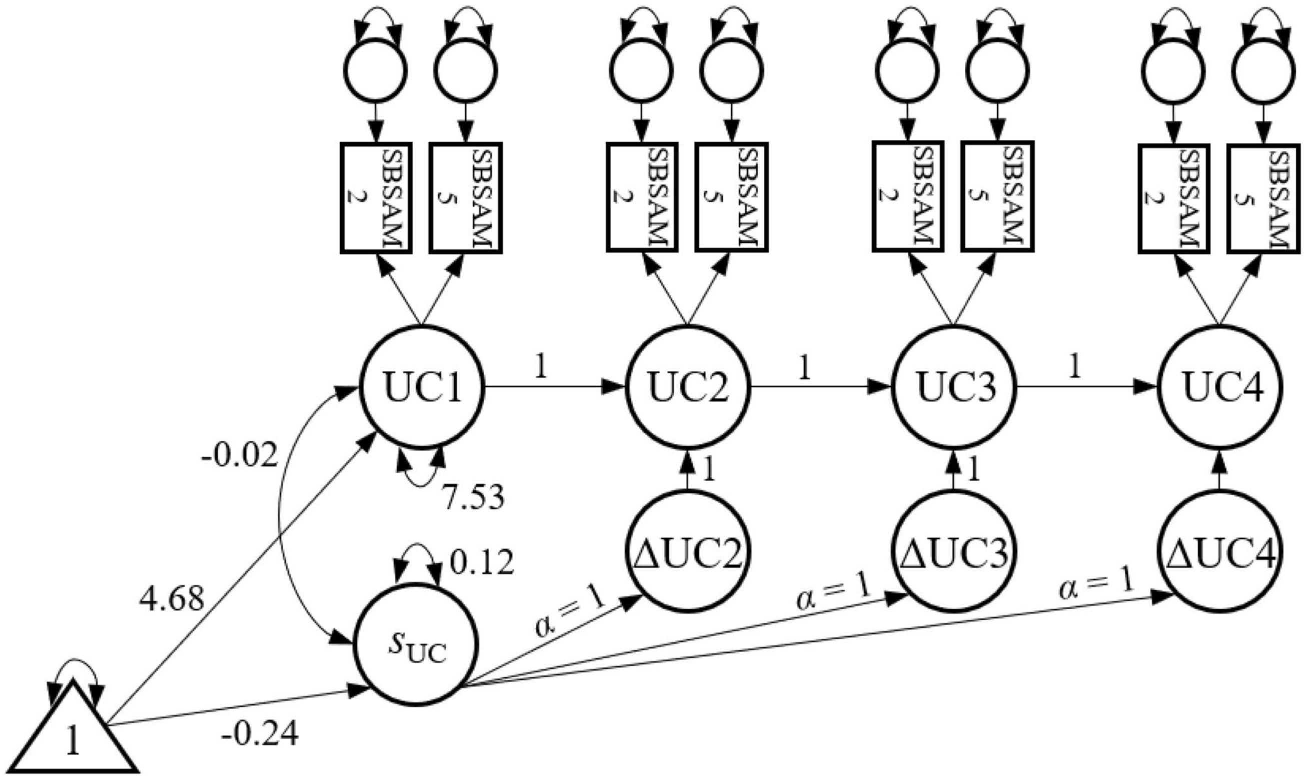

Fig. 2 Best-fitting univariate latent change score model (constant change model) for unconditional belief changes over the four days. Only key parameters are shown for clarity. Rectangles represent observed variables, small circles represent error variances, large circles represent latent variables, and the triangle represents a constant. Single-headed arrows indicate either regression coefficients, or means. Double-headed arrows indicate variances. Error variances of items within each timepoint were allowed to covary and error variances of the same item at each timepoint were allowed to covary, but are not shown in the diagram for clarity. Item SBSAM2 = "People think I'm inferior", and item SBSAM5 = "People don't respect me". s_{UC} represents the constant change component for unconditional beliefs, and α represents the factor loadings on the constant change component. *UC* unconditional beliefs, *ΔUC* change in unconditional beliefs, *SBSAM* Self-Beliefs related to Social Anxiety scale–Modified

change model on the BIC. The constant change model had similar fit when compared with the dual change model, Δ scaled $\chi^2(1) = 0.79$, $p = 0.374$. Based on parsimony, the constant change model was selected as the superior model (see Fig. 3).

The constant change model indicated participants had an average latent high standard beliefs score of 4.80 ($SE = 0.33$, $p < 0.001$, 95% CI [4.15, 5.45]) at the first time point, and there was significant variation in latent high standard belief scores at the first time point ($\sigma^2 = 7.30$, $SE = 0.92$, $p < 0.001$, 95% CI [5.49, 9.10]), reflecting individual differences in baseline values. The constant change component indicated significant daily mean decreases (mean $s = -0.19$, $SE = 0.08$, $p = 0.014$, 95% CI [− 0.34, − 0.04]). There was significant variation in the constant change component ($\sigma^2 = 0.24$, $SE = 0.09$, $p = 0.005$, 95% CI [0.07, 0.41]). The covariance between latent high standard belief scores at the first time point and the constant change component was not significant ($\sigma = -0.22$, $SE = 0.18$, $p = 0.238$, 95% CI [− 0.58, 0.14]).

Bivariate Latent Change Score Models

The selected univariate models for the two maladaptive belief types (both constant change models) were each combined with the selected univariate model for social anxiety (proportional change model) to form bivariate models and cross-construct changes to changes parameters were examined (see Table 4). All models tested in Table 4 had fit indices in the range indicating acceptable to good fit.

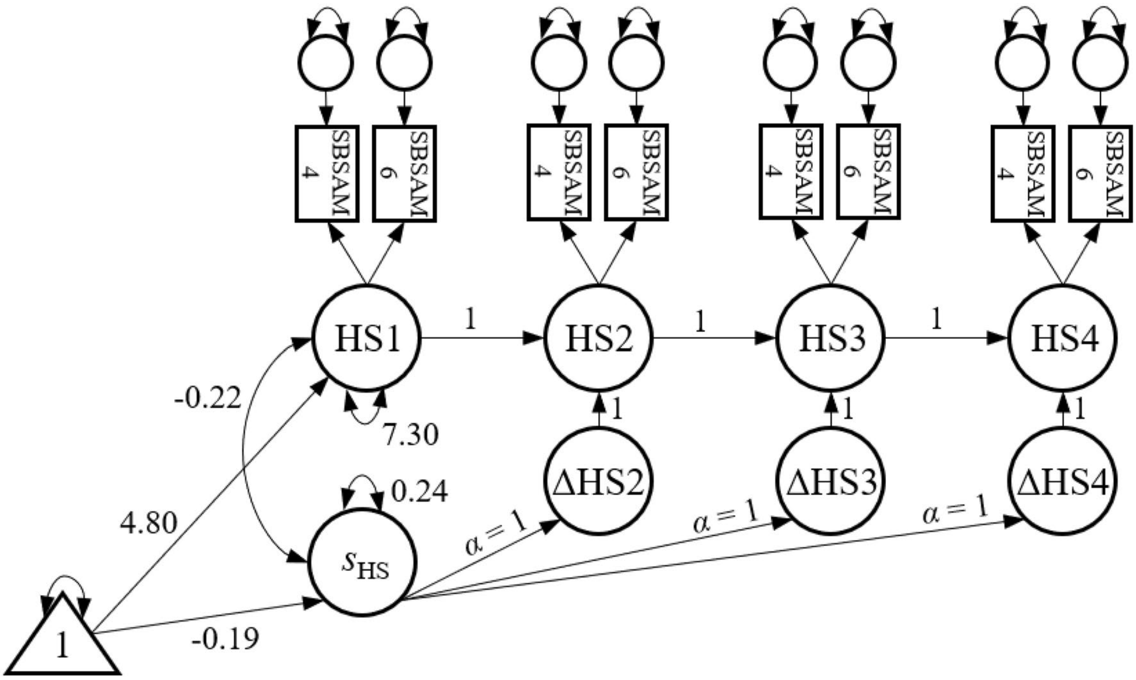

Fig. 3 Best-fitting univariate latent change score model (constant change model) for high standard belief changes over the four days. Only key parameters are shown for clarity. Rectangles represent observed variables, small circles represent error variances, large circles represent latent variables, and the triangle represents a constant. Single-headed arrows indicate either regression coefficients, or means. Double-headed arrows indicate variances. Error variances of items within each timepoint were allowed to covary and error variances of the same item at each timepoint were allowed to covary, but are not shown in the diagram for clarity. Item SBSAM4 = "I must get everyone's approval", and item SBSAM6 = "I need to be liked by everyone". s_{HS} represents the constant change component for high standard beliefs, and α represents the factor loadings on the constant change component. *HS* high standard beliefs, *ΔHS* change in high standard beliefs, *SBSAM* Self-Beliefs related to Social Anxiety scale–Modified

Table 4 Bivariate latent change score models

	Models for social anxiety and unconditional beliefs				Models for social anxiety and high standard beliefs			
	No changes to changes model[a]	ΔSA → ΔUC model	ΔUC → ΔSA model	All changes to changes model	No changes to changes model	ΔSA → ΔHS model	ΔHS → ΔSA model	All changes to changes model[a]
Scaled χ^2	196.32	196.46	196.42	195.83	231.68	227.93	227.22	222.41
df	142	141	141	140	142	141	141	140
p	0.002	0.001	0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001
CFI	0.981	0.980	0.980	0.980	0.969	0.970	0.970	0.971
TLI	0.970	0.969	0.969	0.969	0.952	0.953	0.953	0.955
RMSEA	0.072	0.073	0.072	0.073	0.091	0.089	0.089	0.088
AIC	4003.50	4005.48	4005.07	4006.23	4047.07	4045.50	4045.43	4043.29
BIC	4205.06	4209.33	4208.92	4212.37	4248.63	4249.35	4249.28	4249.43

Bivariate latent change score models retained correlated error variances specified in univariate latent change score models (i.e., error variances of the same item at each of the timepoints correlated; error variances of items within each timepoint correlated). In addition, bivariate latent change score models allowed: error variances of MSPIN-M and SBSA-M items within each timepoint to be correlated, and initial factor scores and constant change components (where evident in the model) to be correlated (see Grimm et al., 2012)

ΔSA change in social anxiety, *ΔUC* change in unconditional beliefs, *ΔHS* change in high standard beliefs, *df* degrees of freedom, *CFI* comparative fit index, *TLI* Tucker-Lewis index, *RMSEA* root mean square error of approximation, *AIC* Akaike's Information Criterion, *BIC* Bayesian Information Criterion

[a]Selected model

Models for Social Anxiety and Unconditional Beliefs

As shown in Table 4, all models had similar fit indices, and using the scaled χ^2 difference test, the no changes to changes model had similar fit to the other three models, all Δ scaled $\chi^2 < 1.00$, all $ps > 0.605$. Based on parsimony, the no changes to changes model was selected as the best-fitting model, suggesting that changes in social anxiety were not associated with future changes in unconditional beliefs, and changes in unconditional beliefs were not associated with future changes in social anxiety.

Models for Social Anxiety and High Standard Beliefs

As shown in Table 4, the all changes to changes model appeared to have better fit indices than the other models, and exhibited significantly better fit compared to the other models (compared to no changes to changes model, Δ scaled $\chi^2(2) = 11.82$, $p = 0.003$; compared to ΔSA → ΔHS model, Δ scaled $\chi^2(1) = 11.19$, $p < 0.001$; compared to ΔHS → ΔSA model, Δ scaled $\chi^2(1) = 6.16$, $p = 0.013$). The all changes to changes model was selected as the best-fitting model (see Fig. 4). In this model: (a) prior day social anxiety level ($\beta = -0.07$, $SE = 0.02$, $p = 0.001$, 95% CI [− 0.12, − 0.03]) and prior day changes in high standard beliefs ($\xi = 0.18$, $SE = 0.07$, $p = 0.008$, 95% CI [0.05, 0.32]) significantly predicted subsequent day changes in social anxiety, and (b) prior day changes in social anxiety ($\xi = -2.93$, $SE = 1.39$, $p = 0.036$, 95% CI [− 5.66, − 0.20]) predicted subsequent day changes in high standard beliefs. Thus, individuals who had greater increases in high standard beliefs reported the next day greater increases in social anxiety (based on $\xi = 0.18$). Standardising this coefficient based on the standard deviation of the relevant latent factors resulted in an average effect size across timepoints indicating an increase of 1 standard deviation on the high standard beliefs latent change construct was associated with a 0.98 standard deviation increase on the social anxiety latent change construct the next day. Additionally, individuals who had greater increases in social anxiety reported the next day smaller increases or even declines in high standard beliefs (based on $\xi = -2.93$). Standardising this coefficient based on the standard deviation of the relevant latent factors resulted in an average effect size across timepoints indicating an increase of 1 standard deviation on the social anxiety latent change construct was associated with a 0.73 standard deviation decrease on the high standard beliefs latent change construct the next day.

Discussion

The current study aimed to examine the dynamics of three maladaptive social-evaluative belief types and their relationship with changes in social anxiety in the real-world, day-to-day life contexts of individuals with elevated social anxiety. We predicted that daily changes in each of the maladaptive belief types would positively predict future daily changes in social anxiety, and that daily changes in social anxiety would not be related to future daily changes in each of the belief types. Before evaluation of these predictions, we examined whether the measures of our constructs of interest were measurement invariant (cf. Grimm & Ram, 2018). Our measure of conditional beliefs did not exhibit measurement invariance over time, meaning that the measurement properties of this measure was not the same across the timepoints of this study. Hence, changes in conditional beliefs over time could not be accurately examined, as changes in these beliefs could be due to true changes in these beliefs over time, changes in the measure's measurement properties, or some combination of these factors. In contrast, our measures of social anxiety, unconditional beliefs, and high standard beliefs did exhibit measurement invariance over time. This indicated that each of these constructs were measured in the same way over the timepoints of this study, and could be examined with latent change score models. Ultimately, bivariate latent change score models showed that participants who reported greater increases in high standard beliefs reported the next day greater increases in social anxiety, consistent with predictions. However, against predictions, changes in unconditional beliefs were not associated with next day changes in social anxiety. The bivariate latent change score models also showed that participants who reported greater increases in social anxiety reported the next day smaller increases or declines in high standard beliefs, against predictions. In line with predictions, changes in social anxiety were unrelated to next day changes in unconditional beliefs.

The finding that increases in high standard beliefs were associated with next day greater increases in social anxiety is consistent with previous findings suggesting that changes in maladaptive social-evaluative beliefs positively predict future changes in social anxiety (e.g., Gregory et al., 2018). The finding in relation to high standard beliefs also extends previous research by highlighting the specific belief type that is predictive of future changes in social anxiety. Notably, the specificity of the finding to high standard beliefs is consistent with theoretical models of SAD that have emphasised the anxiety generating role of high standard beliefs (e.g., Clark & Wells, 1995; Hofmann, 2007). Indeed, because an increase in high standard beliefs positively predicted social anxiety, our observation seemingly supports the claim that

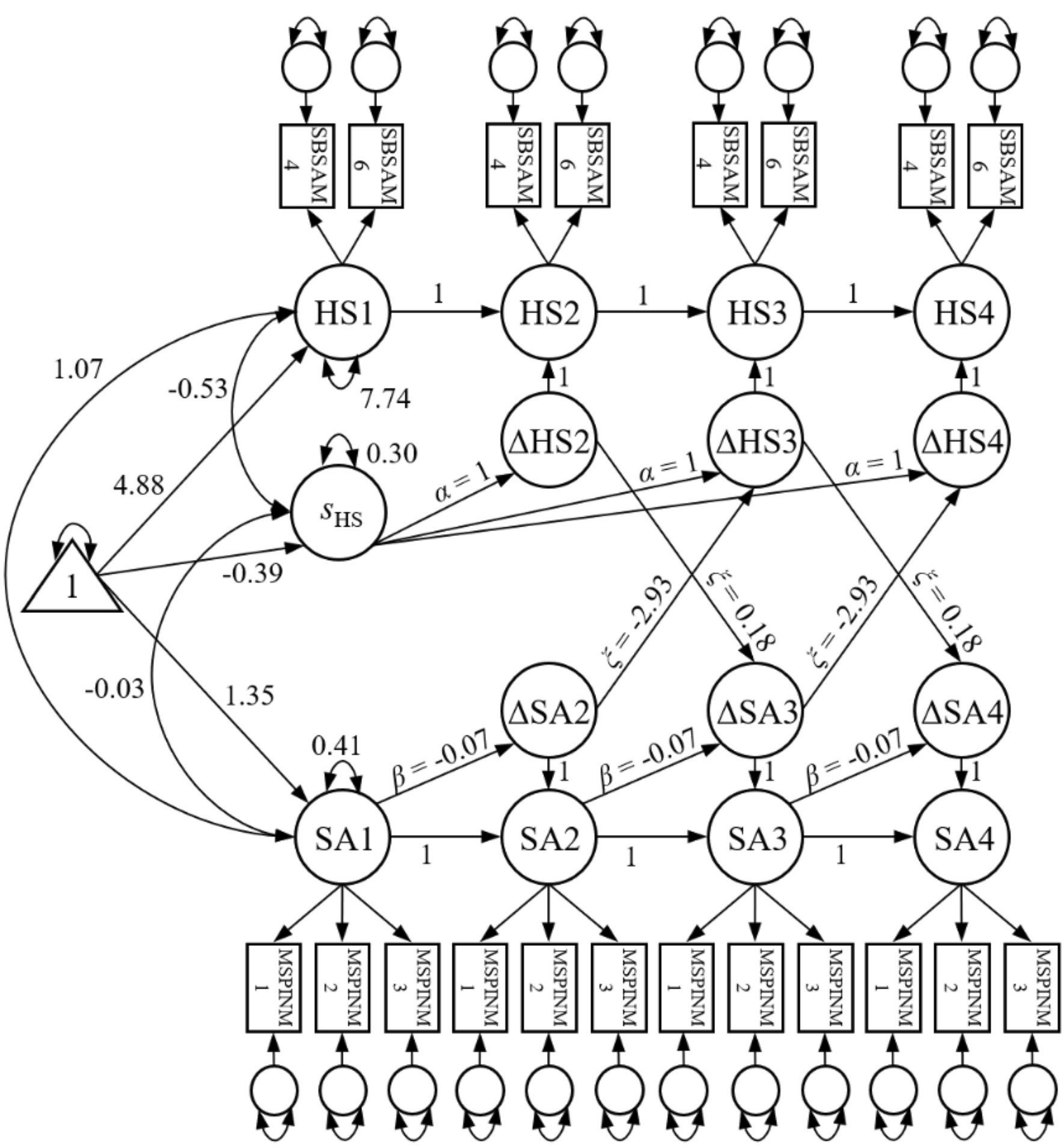

Fig. 4 Best-fitting bivariate latent change score model (all changes to changes model) for high standard belief changes and social anxiety changes over the four days. Only key parameters are shown for clarity. Rectangles represent observed variables, small circles represent error variances, large circles represent latent variables, and the triangle represents a constant. Single-headed arrows indicate either regression coefficients, or means. Double-headed arrows indicate variances. Error variances of items on the same scale within each timepoint were allowed to covary, error variances of the same item at each timepoint were allowed to covary, and error variances of MSPINM and SBSAM items within each timepoint were allowed to covary, but are not shown in the diagram for clarity. Item SBSAM4 = "I must get everyone's approval", item SBSAM6 = "I need to be liked by everyone", item MSPINM1 = "Fear of embarrassment caused me to avoid doing things or speaking to people", item MSPINM2 = "I avoided activities in which I would have been the center of attention", and item MSPINM3 = "I was afraid of being embarrassed or looking stupid". The proportional change parameter ($\beta = -0.07$), and the two changes to changes parameters ($\xi = -2.93$ and $\xi = 0.18$) were each constrained to be equal over time. s_{HS} represents the constant change component for high standard beliefs, and α represents the factor loadings on the constant change component. *HS* high standard beliefs, *ΔHS* change in high standard beliefs, *SA* social anxiety, *ΔSA* change in social anxiety, *SBSAM* Self-Beliefs related to Social Anxiety scale–Modified, *MSPINM* Mini Social Phobia Inventory–Modified

high standard beliefs may figure prominently in SAD's aetiology (e.g., Clark & Wells, 1995; Wong & Rapee, 2016). As such, our finding, along with Gregory et al.'s (2018) observation that maladaptive social beliefs maintain social anxiety (i.e., a reduction in maladaptive beliefs positively predicted a reduction in social anxiety in patients with

SAD), collectively align with the notion that maladaptive beliefs might play a central role in both the instigation (i.e., risk factor) and the maintenance of SAD.

The finding that unconditional beliefs were not predictive of next day changes in social anxiety deserves some explanation, given theoretically unconditional beliefs are also proposed to lead to the experience of anxiety in social-evaluative situations (e.g., Clark & Wells, 1995). One possibility is that items of the SBSA-M captured a narrow range of unconditional beliefs, and did not capture the changes in idiosyncratic unconditional beliefs of participants that actually related to next day changes in social anxiety. Another possibility is that unconditional beliefs may have been associated with future changes in social anxiety within relatively shorter time windows (e.g., hours; cf. Mörtberg et al., 2015). Thus, daily measures of these constructs do not have the temporal resolution needed to capture their dynamics. Future research will need to investigate these potential explanations.

The finding that participants who reported greater increases in social anxiety reported the next day smaller increases or declines in high standard beliefs was unexpected. This was the case because previous research has shown that changes in social anxiety are unrelated to future changes in maladaptive social-evaluative beliefs (Gregory et al., 2018), and furthermore, models of SAD have typically proposed that the experience of social anxiety can ultimately reinforce or exacerbate maladaptive social-evaluative beliefs (e.g., Hofmann, 2007). Considering the emphasis on avoidance in the items of the MSPIN-M, it is possible that increases in social anxiety corresponded with increases in avoidance of social-evaluative situations, thus resulting in the next day smaller increases or declines in high standard beliefs. Essentially then, avoidance may have prevented high standard beliefs from being triggered. Future studies will need to further examine this possibility, and including separate measures of social anxiety and social avoidance will help in this regard. The unexpected finding may also be due to how participants interpreted high standard belief items of the SBSA-M ("I must get everyone's approval", "I need to be liked by everyone"). These items could have been interpreted as applying to past social situations or future social situations. Given evidence that anxious anticipation of future social-evaluative situations increases the salience of high standard beliefs (e.g., Wong & Moulds, 2011b), future research should also examine whether explicitly wording high standard belief items as applying to future social situations (e.g., "in upcoming social situations, I must get everyone's approval") leads to results that are consistent with theory (e.g., Hofmann, 2007).

Implications of the current study should be considered. Considering that both subclinical and clinical manifestations of social anxiety are associated with life interference and warrant intervention (e.g., Fehm et al., 2008; Kollman et al., 2006; Weeks et al., 2009), the finding of high standard beliefs as a leading indicator of future changes in social anxiety in this study is consistent with treatment strategies that target these beliefs. Such strategies, found in some CBT treatment packages for SAD, include realistic objective social goal setting exercises prior to engaging in social-evaluative situations, and behavioural experiments (e.g., Clark, 2001; Hoffmann & Otto, 2008). In relation to behavioural experiments, they can be used to help: (a) challenge and re-evaluate inflexible high social standards, and (b) discover that there are a number of different ways of behaving in social situations that are acceptable.

In follow-up research, a number of issues require further examination. We note that causality cannot be inferred from this study given the associational nature of the data, and experimental studies which manipulate for example maladaptive social-evaluative beliefs, or more specifically high standard beliefs, to see the effect on social anxiety will be needed (see Reyes et al., 2020). We further note that the current study focused on two maladaptive belief types and examined each in relation to social anxiety in separate bivariate latent change score models. There is a possibility, however, that unmeasured variables may have affected the examined relationships, although it should be noted that theoretical descriptions tend to highlight the relationship between beliefs and social anxiety as fundamental (e.g., Clark & Wells, 1995). Our study also used a limited number of data collection time-points, and future studies could use methods that allow greater frequency of data collection (e.g., ecological momentary assessment).

Further points for consideration in future research relate to the measures used. This study used modified versions of measures of social anxiety and maladaptive social-evaluative beliefs to enable brief daily measures of the constructs. Arguably the brevity of these measures limits the coverage of the constructs of interest. On the other hand, the items selected for the modified versions were based on previous psychometric studies of these measures (e.g., Connor et al., 2001; Wong et al., 2014), and fairly acceptable internal consistency indices were observed in the present dataset, thus suggesting the soundness of the measurement tools used here. Nonetheless, a critical next step will be to ensure the psychometric integrity of these abbreviated measures. Future research will also need to investigate whether a longitudinally measurement invariant measure of conditional beliefs can be developed. This would then allow an examination of the dynamic interplay between social anxiety and conditional beliefs. Indeed, longitudinally measurement invariant measures of social anxiety and all three belief types would allow an examination of how the three types of beliefs interact with one another over time and bidirectionally relate to social anxiety. It is notable that such an examination would require the use of graphical vector autoregressive modelling on intensive time-series data (for details, see Epskamp, 2020), an approach that would require many more time points (e.g., seven times daily over a two-week period; Aalbers et al., 2019) than that used in the present study.

A number of points related to our sample should also be considered in future research. One might find it a limitation that this study did not include patients with SAD. However, we do not view this as a limitation. On the one hand, a central tenet of previous literature is that maladaptive social-evaluative beliefs figure prominently in the development of social anxiety, and are thus not confined to patients with SAD. On the other hand, our sample was heterogeneous, with participants' SPIN mean score of 36.70 ($SD = 9.80$), enabling us to avoid potential problems of restricted range variability that are common in clinical samples (e.g., Terluin et al., 2016; Wigman et al., 2016). Nevertheless, future iterations would want to consider the latent change score models in people with SAD and at varying points in the development and course of SAD. We also note that 88% of our sample included women. Research indicates that there are differences between women and men with regard to social anxiety (e.g., women with SAD report greater clinical severity and exhibit greater physiological responses to social-evaluative situations compared to men with SAD; Asher et al., 2017). As such, the results of this study may not generalise to men with elevated social anxiety, and this should be further investigated in future research. Another point to consider in future research is that the present study had a relatively small sample. Previous studies with the same analytical approach have used samples either smaller or comparable in size to the sample size of the current study (e.g., $N = 77$, Gregory et al., 2018; $N = 69$, Kocovski et al., 2015; $N = 43$, Teachman et al., 2008). Interestingly, a power analysis for overall model fit in terms of the RMSEA and a hypothesis of "not-acceptable fit" (rather than a hypothesis of "not-close fit"; MacCallum et al., 1996) showed that for each of our two selected bivariate latent change score models (see Table 4), there was 0.99 power to reject a not-acceptable fit hypothesis (assuming H_0: RMSEA ≥ 0.11, H_1: RMSEA $= 0.05$, and considering elevated RMSEA values in small samples for correctly specified models; Kenny et al., 2015), although power was less for the univariate latent change score models tested (power ranged from 0.43 to 0.80).

The current study adds to the existing literature by showing that in the day-to-day life contexts of individuals with elevated social anxiety, high standard beliefs appear to play a prominent role in the dynamics involving social anxiety. This finding is consistent with the need for treatment packages for social anxiety that include strategies that target high standards, and provides a basis for future research that further examines the dynamics between specific maladaptive social-evaluative belief types and social anxiety.

Declarations

Conflict of Interest All authors declare that they have no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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

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