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10   The Development and Validation of the Thai-translated Irrational Performance

11   Beliefs Inventory (T-iPBI)

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13   Chotpitayasunondh, V., & Turner, M. J.*

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18   *Corresponding author: B180, Brindley Building, Staffordshire University, Leek

19   Road, Stoke-on-Trent, ST4 2DF, m.turner@staffs.ac.uk

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1   **Abstract**

2   One of the most commonly employed cognitive-behavioural approaches to

3   psychotherapy is rational-emotive behaviour therapy (REBT), but researchers have

4   been troubled by some of the limitations of irrational beliefs psychometrics. As a

5   result, Turner et al. (2018a) developed the Irrational Performance Beliefs Inventory

6   (iPBI), a novel measure of irrational beliefs for use within performance domains.

7   However, the linguistic and cross-cultural adaptation of the iPBI into other languages

8   is necessary for its multinational and multicultural use. The purpose of this paper is to

9   develop the Thai-translated version of the iPBI (T-iPBI) and examine the validity and

10   reliability of the T-iPBI. Data retrieved from 166 participants were analysed using

11   SPSS and AMOS software packages. Thirty-three participants completed two follow-

12   up T-iPBI measurements (1-week and 3-week repeat assessment). After the linguistic

13   and cross-cultural adaptation processes, the T-iPBI demonstrated excellent levels of

14   reliability, with internal consistency and test-retest reliability, as well as construct,

15   concurrent, and predictive validity. The current findings indicate that the 20-item T-

16   iPBI can be used as a self-assessment instrument to evaluate individual's irrational

17   performance beliefs in a Thai population. We also highlight the implications of this

18   study and suggest a variety of future research directions that stem from the results.

19   **Keywords:** Irrational beliefs; iPBI; REBT; Thai; Cross-cultural adaptation

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1   **The Development and Validation of the Thai-translated Irrational Performance**

2   **Beliefs Inventory (T-iPBI)**

3   Irrational beliefs as defined within rational emotive behaviour therapy (REBT; Ellis,

4   1957) are extreme, rigid, and illogical beliefs that hinder human functioning (Ellis &

5   Dryden, 1997). Research consistently reveals that greater irrational beliefs are related

6   to poorer psychological wellbeing and mental health (Turner, 2016), associated with a

7   vast array of dysfunctional emotions and maladaptive behaviours (Szentagotai &

8   Jones, 2010; Visla, Fluckiger, Holtforth, & David, 2016). Researchers have begun to

9   investigate irrational beliefs within performance contexts such as academic (Allen, El-

10   Cheikh, & Turner, 2017), occupational (Turner et al., 2018a), and athletic (Turner &

11   Moore, 2016) settings. The extant research demonstrates that irrational beliefs are

12   related to poorer mood in university students (Allen et al., 2017), greater

13   psychological distress (anger, anxiety, and depression) in occupational workers

14   (Turner et al., 2018a), greater psychological distress in athletes (Turner, Carrington,

15   & Miller, 2017), and greater threat appraisals in soccer coaches (Dixon, Turner, &

16   Gillman, 2017).

17   Research investigating irrational beliefs in performance settings has been

18   limited by the lack of a contextually specific psychometric of irrational performance

19   beliefs in recent years (Turner & Barker, 2014). In response to the apparent need for a

20   valid measure of irrational performance beliefs, Turner et al. (2018a) developed the

21   irrational performance beliefs inventory (iPBI). The iPBI is a 28-item measure of the

22   four core irrational beliefs (7-items per core belief) of REBT (Dryden & Branch,

23   2008), namely primary irrational beliefs (PIB), and the three secondary irrational

24   beliefs of awfulizing (AWF), low frustration tolerance (LFT), and depreciation

25   (DEP). Importantly, the four core irrational beliefs are measured in relation to

1   performance situations such as success and failure, and therefore the iPBI is

2   supposedly generalizable to all achievement contexts (e.g., occupational, athletic,

3   military, and academic).

4   The majority of research examining the use of REBT in performance settings

5   has been conducted using Western, mainly European, participant samples. There are

6   two exceptions that have applied REBT with athletes in a Malaysian (Deen, Turner, &

7   Wong, 2017) and a Chinese (Si & Lee, 2008) sample. Deen et al. (2017) found that

8   REBT was able to reduce irrational beliefs and increase self-reported resilience in

9   Malaysian squash players, and Si and Lee (2008) found a reduction in behaviors

10 related to LFT, and performance enhancement in competition, in an Olympic table

11 tennis athlete. However, whether and to what extent REBT can be applied in Eastern

12 samples is not fully understood, and research findings using Western samples cannot

13 be automatically generalised to Eastern samples. The current trend of psychology

14 research tends to motivate researchers to determine the multicultural validity and

15 reliability of their theories (Lega & Ellis, 2001). If a greater understanding is to be

16 garnered about how REBT can be used with Eastern populations, first an

17 understanding must be garnered about whether the relationships between irrational

18 beliefs and psychological distress found in past research with Western populations

19 hold true in Eastern populations.

20   One major challenge to this endeavour is the lack of translated and validated

21 psychometrics of irrational beliefs in Eastern populations. One exception is the Thai-

22 translated version of the irrational beliefs test (IBT; Ruangjun, 1996). The original

23 IBT (Jones, 1968) is a 100-item self-report instrument comprising 10-items for each

24 of the 10 irrational belief facets. In the Thai-translated version of the IBT 60-items

25 were retained for reasons unexplained by Ruangjun (1996), where each of the 10

1   irrational belief facets are measured by 6-items. To the current authors' knowledge,

2   the Thai IBT is the first and only instrument measuring irrational beliefs using Thai

3   language. Accurate measurement of irrational performance beliefs is important for

4   research and practice. Since REBT aims to reduce irrational beliefs to promote

5   psychological functioning (Ellis & Dryden, 1997), being able to accurately assess

6   irrational beliefs as part of a needs analysis, or as part of continual monitoring over

7   the course of an intervention, has implications on how the effectiveness of REBT is

8   determined. As such, accurate and language-appropriate measures of irrational beliefs

9   in Eastern populations is a clear research need.

10   Since the iPBI reflects contemporary REBT theory, assesses beliefs only, is

11   contextually specific to performance settings, and has been used in Eastern samples

12   (Deen et al., 2017), the translation and cross-cultural validation of the iPBI in Eastern

13   samples is warranted. The IBT has various limitations that preclude its use in

14   contemporary REBT research (see Terjesen, Salhany, & Sciutto, 2009, for a review),

15   especially research conducted in performance settings. For example, many of the IBT

16   items capture emotions and behaviours rather than beliefs, and some of the items that

17   are proposed to assess beliefs actually assess inferences or automatic thoughts.

18   Therefore, in the current study, the iPBI is translated into Thai for the first time in

19   research, and the Thai version of the iPBI is examined for its validity and reliability in

20   a Thai sample. A Thai version of the iPBI can help to generate research on the mental

21   health implications of irrational beliefs in Thai samples, and can also offer REBT

22   practitioners working in Thailand a valid psychometric for applied work.

23   The current study has three main aims. First, the iPBI will be translated into

24   Thai following procedures for cross-cultural psychometric adaptation (Wild et al.,

25   2005). Second, the Thai translated iPBI (T-iPBI) will undergone validity and

reliability testing to assess its psychometric properties. As part of testing the T-iPBI,

associations between irrational beliefs and psychological distress will be determined

in a Thai sample for the first time in research. In line with past research, it is

hypothesised that irrational beliefs as measured using the T-iPBI will be related to

greater psychological distress. Finally, the test-retest reliability of the T-iPBI will be

assessed to determine the consistency of the psychometric across three time points. In

line with recent research (Turner et al., 2017), it is hypothesised that irrational beliefs

as measured using the T-iPBI will remain stable across three time points.

Methods

Cross-cultural adaptation of the iPBI into Thai

The original iPBI was translated into Thai with permission from developers

(Turner et al., 2018a). The translation process followed the Translation and Cultural

Adaptation (TCA) – Principles of Good Practice, proposed by the TCA working

group of the International Society for Pharmacoeconomics and Outcome Research's

Quality of Life Special Interest Group (ISPOR's QOL-SIG; Wild et al., 2005). The

TCA protocol comprises 10 stages:

Stage I: preparation. Together with original developers, the conceptual basis

for the items in the questionnaire was discussed in order to be used by translators in

the translation processes.

Stage II: forward translation. The original version of the iPBI was translated

independently into Thai by the translation and languages institutes of two Thai

universities. Translators were instructed to produce colloquial translations.

Stage III: reconciliation. Discrepancies between the two forward translations

were identified and resolved by consensus. They were reconciled and merged into a

single forward translation by the independent native Thai speaker.

Stage IV: back translation. The reconciled Thai-translated questionnaire was re-translated back into English by two additional translation and languages institutes of two independent Thai universities.

Stage V: back translation review. The differences between the two back-translated versions and the original version were identified. Only minimal problems in items were highlighted and refined following the revision of the back translated versions against the original English version.

Stage VI: harmonization. To ensure global consistency and conceptual equivalence between the Thai version and other translated versions, usually the newly translated version is compared to all translated versions in other languages. However, at the time of translation, the iPBI had not previously been translated into any other languages so we could not complete this phase.

Stage VII: cognitive debriefing. The newly Thai-translated iPBI was tested for cognitive equivalence on a small group of respondents ($n = 5$) in order to check understandability, interpretation, and cultural relevance. Participants included in this phase were randomly recruited from members of the Thai association in the UK. The interview was done by an experienced Thai consultant, who was familiar with carrying out cognitive debriefing interviews. Results from this cognitive debriefing interview showed adequate participant understanding of the translation.

Stage VIII: review of cognitive debriefing results and finalization. Researchers reviewed the results from the previous stage. Following an agreement between the researchers and the cognitive debriefing interviewer on minor changes, the translation was finalized.

Stage IX: proofreading. The finalized translation was proofread by checking and correcting any remaining spelling, grammatical, and/or other errors.

1   **Stage X: final report.** The final report including a full description of

2   methodology used is presented in the current article.

3   **Statistical analyses of the T-iPBI**

4   **Measures**

5   **Thai-translated irrational Performance Beliefs Inventory.** Turner et al.

6   (2018a) developed and validated the original iPBI as a 28-item psychometric of the

7   four core irrational performance beliefs. Participants are asked to indicate their

8   agreement on the 28-items on a 5-point Likert-scale from 1 (*strongly disagree*) to 5

9   (*strongly agree*). Higher scores reflect stronger irrational beliefs. The iPBI

10   demonstrates good internal consistency (α = .90 - .96), and criterion validity (r = .47 -

11   .81) within a professional working environment (Turner et al., 2018a), and good test-

12   retest reliability in academy athlete and university student samples (Turner, Slater,

13   Dixon, & Miller, 2018). In the present study, the iPBI was translated into Thai, and

14   was used in all subsequent data collection and analyses.

15   **Thai-translated Irrational Beliefs Test (IBT).** The original Irrational Beliefs

16   Test (IBT; Jones, 1968) is a 100-item self-report instrument comprising 10-items

17   chosen to represent each of the 10 irrational belief facets (i.e. demand for social

18   approval, high self-expectations, blame proneness, frustration reactivity, emotional

19   irresponsibility, anxious overconcern, problem avoidance, dependency, helplessness,

20   and the need for perfect solutions to problems). Participants are asked to indicate the

21   frequency with which they experience each item on a 5-point Likert-scale from 1

22   (*almost never*) to 5 (*most of the time*). Higher scores demonstrate greater irrationality.

23   Jones (1968) reported good internal consistency (ranging between .66-.80 for

24   subscales and .74 for full-scale) and test-retest reliability (ranging between .68-.87 for

25   subscale stabilities and .92 for full-scale stability). In the current study, the Thai-

1   translated version of the IBT (Ruangjun, 1996) is used, which includes 60-items (6-

2   items per irrational belief facet). The Thai-translated version of the IBT demonstrated

3   good internal consistency (Cronbachs alpha = .86) in a nursing student sample. To the

4   current authors' knowledge, this scale is the first and only instrument measuring

5   irrational beliefs using Thai language.

6   **Hospital Anxiety and Depression Scale (HADS).** In the original iPBI

7   research conducted by Turner et al. (2018a), the State-Trait Personality Inventory

8   (STPI; Spielberger, 1979) was employed to measure anxiety and depression in

9   participants. Unfortunately, the STPI has not been Thai-translated, and therefore, an

10   alternative measurement with similar constructs was administered in the current

11   study. The Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith,

12   1983), contains two seven-item subscales, the HADS-A measuring anxiety such as "I

13   feel restless as I have to be on the move" and "I get sudden feelings of panic", and the

14   HADS-D measuring depressive symptoms such as "I feel as if I am slowed down"

15   and "I feel cheerful", using a four-point Likert response scale. Previous studies using

16   the original version of HADS report good validity and internal consistency for the

17   subscales of anxiety and depression (α = .68 - .93 and α = .67 - .90, respectively;

18   Bjelland, Dahl, Haug, & Neckelmann, 2002).

19   The Thai-translated version of the HADS (Nilchaikovit, Lotrakul, &

20   Phisansuthideth, 1996), has good internal consistency (α = .89 for anxiety symptoms

21   and α = .85 for depressive symptoms). In the current study, the mean score for anxiety

22   subscale 6.69 (SD = 3.61; α = .79) and the mean score for depression was 4.11 (SD =

23   3.37; α = .81).

24   **Participants**

1   A sample of at least five participants per item (28 items x 5 = 140 participants)

2 is recommended by DeVellis (2012) for statistical validation analyses and factor

3 analysis. Therefore, one hundred and sixty-six participants (61 men, 104 women, 1

4 did not disclose) ranging in age from 18 to 71 ($M = 31.08$, $SD = 7.25$) were recruited.

5 The sample consisted of 45 current members of the Samaggi association who

6 temporary reside in the UK and 121 participants from alumni of the Samaggi

7 association and acquaintances on social networking sites who are currently in

8 Thailand. Participants, whose names appeared on the Samaggi association's social

9 networking site, were randomly contacted if they were able to speak, read, and write

10 the Thai language. The demographic information for the current sample is presented

11 in Table 1.

12   INSERT TABLE 1 HERE.

13   The required sample size for three time-point test-retest, to an estimated

14 typical planned value of 0.8 with a 95% CI width of 0.20, was 36 participants

15 (Shoukri, Asyali, & Donner, 2004). Reminders on the Samaggi association's social

16 networking site were sent out to all participants before each retest along with

17 instructions on how to access and complete the Web-based T-iPBI assessments. In

18 order to get an accurate result of test-retest reliability, participants had to complete the

19 retest questionnaires within 24 hours after notification. In the current sample, 19.88%

20 of respondents ($N = 33$) completed the questionnaires at three time points; time-point

21 1 (T1), time-point 2 (T2) 7-days after T1, and time-point 3 (T3) 21-days after T2.

22 Therefore, thirty-three participants (16 men and 17 women) ranging in age from 20 to

23 40 ($M = 28.00$, $SD = 6.03$) consisted of 13 current members and 20 alumni of the

24 Samaggi association.

25 **Procedures**

1   A link to the online questionnaire including the Thai-iPBI, the Thai-IBT, and

2   the Thai-HADS, was sent to personal emails or preferred personal social networking

3   site accounts. Potential participants were given detailed information about the

4   research and that their participation would be anonymous and data would be kept

5   confidential. After giving their informed consent, participants completed the

6   questionnaire. Prior to all data collection, full ethical approval was granted by a U.K.

7   university.

8   **Data analyses**

9   **Factor analysis.** The structure of the T-iPBI scale was analysed using

10   structural equation modelling (SEM) software SPSS AMOS version 24.0.

11   Confirmatory Factor Analysis (CFA) was used to assess the proposed measurement

12   model in a SEM. CFA evaluated a priori hypothesis of the original four-factor

13   measurement model structure proposed by Turner et al. (2018a).

14   **Criterion-related validity.** To determine scale criterion validity, both

15   concurrent and predictive validity were determined. We examined criterion validity of

16   the T-iPBI by assessing the Pearson product-moment correlation coefficients for the

17   associations between the T-iPBI subscales and the Thai IBT and Thai HADS. In this

18   phase, the performance of the T-iPBI was compared to a criterion standard, which

19   presumably measure the same construct. Concurrent validity is also presented when

20   the T-iPBI subscales can predict irrational beliefs from the Thai IBT in a multiple

21   regression analysis. For predictive validity of the scale, we tested the relationships

22   between T-iPBI subscales and the Thai HADS subscales (anxiety and depression).

23   **Internal consistency reliability.** Cronbach's Alpha coefficients, which refer

24   to the general agreement between composite items of a given construct, were used to

1   indicate the internal consistency of the T-iPBI subscales. Cronbach's alpha above .70

2   indicates acceptable reliability (Nunnally & Bernstein, 1994).

3   **Test-retest reliability.** Test-retest reliability was measured to ensure the

4   establishment of repeatability of the T-iPBI (Anthoine, Moret, Regnault, Sébille, &

5   Hardouin, 2014). Results obtained from T-iPBI over three time-points should be

6   representative, reproducible, and stable over time when administered to the same

7   respondents. The original iPBI demonstrates good test-retest reliability in both athlete

8   and university student samples (Turner et al., 2018b), and therefore it is expected that

9   the T-iPBI should demonstrate good test-retest reliability as well. A subsample of 33

10   participants (from 166) completed the questionnaire at two follow-up time-points (7

11   days and 21 days), to evaluate interclass correlation coefficients (ICCs). The 28-day

12   period was considered long enough to ensure that participants would not recall

13   previous questionnaire responses. Participants were not able to print or save their

14   previous answers and were not given the opportunity to view their previous responses.

15   The ICC estimates and 95% confidence intervals were calculated using SPSS version

16   24.0 based on an absolute-agreement and 2-way mixed-effects model. A one-way

17   repeated-measures MANOVA was also conducted to test differences in T-iPBI score

18   across the three time-points.

19   **Results**

20   **Descriptive statistics**

21   There were some outliers in the data, as assessed by inspection of a boxplot.

22   However, no cases were omitted prior the analyses in line with the minimal mean

23   differences criteria proposed by Mat Roni (2014). All means, standard deviations, and

24   Pearson product-moment correlation coefficients calculated among all variables are

1   shown in Table 2. The mean scores for total T-iPBI was 65.24 (SD = 12.48) with a

2   range of 20 to 98. All intercorrelations were in the expected directions.

3   INSERT TABLE 2 HERE.

4   **Factor Analysis and Construct Validity**

5   The original iPBI scale has four components of irrational performance beliefs:

6   primary irrational beliefs (PIB), low frustration tolerance (LFT), awfulizing (AWF),

7   and depreciation (DEP). Factor analysis for the iPBI supported the 28-item four factor

8   measurement structure with seven-items per subscale. The CFA in the original Turner

9   et al. (2018a) study was replicated in the current study, comparing the proposed

10   second-order four-factor construct model with a unidimensional construct model. The

11   alternative unidimensional measurement model had all items loaded onto one factor.

12   The goodness-of-fit indices used to evaluate the overall fit of both proposed

13   models were the comparative fit index (CFI), the standardized root mean square

14   residual (SRMR), the root mean squared error of approximation (RMSEA) with

15   confidence intervals, and the chi-square per degree of freedom (χ^2/df) ratio. A CFI

16   value of .90 or above indicates a good model fit (Bentler, 1990; Hu & Bentler, 1999).

17   A SRMR value of .08 or below indicates an acceptable model fit. A RMSEA values

18   below .08 represents a model with an adequate fit (Hu & Bentler, 1999). Considering

19   the computed value of CFI, SRMR, RMSEA, and the Chi-square of the Thai version

20   of iPBI, results of the confirmatory factor analysis using AMOS software revealed a

21   somewhat unacceptable model fit for the four-factor model structure. A χ^2 value of

22   798.98 was obtained (df = 346, p < .001, χ^2/df = 2.31). Other goodness-of-fit indices

23   were: CFI = .75, SRMR = .09, RMSEA = .09. The chi-square difference between the

24   hypothesized and final model was statistically significant ($\Delta\chi^2$ = 15.96, p < .001).

25   However, this four-factor 28-item measurement model still indicated a better fit for

1   the data than an alternative unidimensional model, $\chi^2(350) = 1087.09$, $p < .001$, χ^2/df

2    $= 3.11$, CFI $= .59$, SRMR $= .12$, and RMSEA $= .11$, according to the χ^2 difference test

3   for nested models ($\Delta\chi^2 = 288.11$, $\Delta df = 4$, $p < .001$).

4   INSERT FIGURE 1 HERE.

5   In order to determine the most parsimonious model (Figure 1), the poorest

6   loading items from each factor and items with poor factor loadings were removed

7   from the model (< 0.5). As a result, eight items from the 28-item T-iPBI were

8   removed. Specifically, three items from PIB factor ("4. I need my manager/coach to

9   act respectfully towards me", "18. I must not be dismissed by my peers", and "22.

10   Decisions that affect me must be justified"), three items from LFT factor ("1. I can't

11   stand not reaching my goals", "12. I can't bear not getting better at what I do", and

12   "15. I can't bear not being given chances"), an item from AWF factor ("28. It's awful

13   if others think I do not make a valuable contribution"), and an item from DEP factor

14   ("2. If I face setbacks it goes to show how stupid I am"), were omitted. The shortened

15   model was re-modified by adjusting one covariance path at a time on the basis of

16   modification indices and par changes. An investigation of model modification indices

17   indicated adding a covariance path between e5 and e13, between e15 and e25,

18   between e6 and e16, and between e16 and e17. The finalized model's goodness-of-fit

19   was satisfactory, $\chi^2(162) = 297.02$, $p < .001$, $\chi^2/df = 1.83$, CFI $= .90$, SRMR $= .07$,

20   RMSEA $= .07$. Standardized regression weights of the confirmatory factor analysis

21   paths of the T-iPBI model were between .53 and .94 and error variances were

22   between .07 and .92. In summary, the final 20-item T-iPBI demonstrated acceptable

23   construct validity and was deemed acceptable to use as a four-factor measurement

24   structure. The final 20-item four-factor T-iPBI is shown in Figure 2.

25   INSERT FIGURE 2 HERE.

1   **Criterion-related Validity**

2   Pearson product-moment correlation coefficients were calculated among

3   subscales. As seen in Table 2, results revealed moderate correlations (r = .32 - .66, p

4   < .001) among the T-iPBI subscales. Further, correlation coefficients between T-iPBI

5   subscales and total T-iPBI score were computed. As a result, each subscale showed a

6   significant, moderate-to-high, positive relationship (r = .48 - .68, p < .001) to the

7   other subscales.

8   To examine the predictive validity of the T-iPBI, we next computed the

9   correlation coefficients between the T-iPBI and the Thai HADS subscales (anxiety

10   and depression symptoms). As a result, the total score on the T-iPBI significantly

11   correlated with both anxiety (r = .35, p < .001) and depression (r = .35, p < .001).

12   There were small to moderate significant correlation coefficients between subscales

13   of the T-iPBI and anxiety (r = .17 - .33) and depression (r = .17 - .32).

14   To examine the concurrent validity of the 20-item T-iPBI, correlation

15   coefficients were calculated between the T-iPBI and the Thai IBT. The total score on

16   the T-iPBI correlated positively and significantly with the Thai IBT total score (r =

17   .39, p < .001). Furthermore, a standard multiple regression analysis was conducted

18   with IBT as the criterion variable and the scores on each T-iPBI subscale as criterion

19   predictors. The multiple regression model of T-iPBI subscales significantly predicted

20   irrational beliefs in Thai population, $F(4, 161) = 11.08$, p < .001, adj. R^2 = .20.

21   However, it was found that only AWF predicted irrational beliefs and produced a

22   significant R^2 change in the model (β = .37, p < .001), as did PIB (β = .17, p < .05).

23   Table 3 reveals that various strengths of correlation between subscales of the T-iPBI

24   and the Thai IBT subscales. The strongest correlation emerged between PIB and

25   demand for approval (r = .42, p < .001). However, the frustration reactive subscale of

1   the Thai IBT did not significantly correlate with any of the T-iPBI subscales ($p > .05$).

2   INSERT TABLE 3 HERE.

3   **Scale Reliability**

4   **Internal consistency reliability.** The internal consistency of the T-iPBI scale

5   was excellent with a Cronbach's Alpha of .90, as shown in Table 2. The Cronbach's

6   Alpha values of each subscale were also high ($\alpha = .72 - .82$).

7   **Test-retest reliability.** Within the test-retest sample ($N = 33$), mean T-iPBI

8   scores at T1 (Day 0), T2 (Day 7), and T3 (Day 28) were 67.45 ($SD = 11.52$), 66.85

9   ($SD = 12.27$), and 66.76 ($SD = 13.98$), respectively. As shown in Table 4, all T-iPBI

10   subscale scores at T1 correlated significantly with the corresponding re-test scores at

11   T2 and T3. Intraclass correlation coefficients (ICC) were calculated and showed an

12   excellent degree of reliability index in test-retest. The average measure ICC of T-iPBI

13   was .95 with a 95% confidence interval from .90 to .97, $F(32, 64) = 18.35, p < .001$.

14   The ICC results of each subscale are shown in Table 4.

15   INSERT TABLE 4 HERE

16   A one-way repeated-measures MANOVA was conducted in order to further

17   test the T-iPBI's repeatability. According to the Mauchly's test of sphericity, the

18   assumption of sphericity was met, $\chi^2(2) = .64, p = .73$. The T-iPBI score did not

19   significantly change across the three time points, $F(2, 64) = .20, p = .82$, partial $\eta^2 =$

20   .01. In summary, results from ICC and one-way MANOVA indicated that overall

21   mean scores of the T-iPBI remained stable over time.

22   **Discussion**

23   To our knowledge, this is the first published study reporting the successful translation

24   of the iPBI into a non-English language. After a rigorous procedural translation

25   exercise, the original English language iPBI was translated into Thai language,

1   forming the T-iPBI. After cross-cultural and linguistic adaptation, the psychometric

2   reliability of the T-iPBI was examined. Following CFA, a 20-item T-iPBI emerged,

3   confirming the four-factor structure of the scale in a Thai sample. The 20-item T-iPBI

4   then underwent predictive, criterion-related, and test-retest reliability analyses. The

5   finding that irrational beliefs are positively related to anxiety and depression

6   symptomology is consistent with previous research findings using the iPBI (Turner et

7   al., 2018a; Turner, Carrington, & Miller, 2017) and a vast amount of research using

8   an array of alternate irrational beliefs measures (see Visla et al., 2016, for a review).

9   Furthermore, the finding that T-iPBI scores remain stable over time, thus evidencing

10   test-retest reliability, is consistent with recent research findings in U.K. athlete and

11   student samples (Turner et al., 2018b) but extends research by sampling a general

12   population.

13   The T-iPBI is a Thai-translated measure of *performance* beliefs, rather than a

14   measure of *general* beliefs (e.g., SGABS; Lindner et al., 1999). This is important for

15   two chief reasons. First, the research examining irrational beliefs and the use of REBT

16   in performance environments has experienced a sharp incline in recent years, partially

17   because performance is a part of everyday life for most people. Whether it is

18   performing at work, in sport, in school, or at home, situations that involve

19   disapproval, failure, unfairness, rejection, lack of respect, and danger to security arise

20   on a daily basis. The items of the T-iPBI assess irrational beliefs that pertain to these

21   situations, because the item-generation stage of the original iPBI included them in its

22   early development (Turner et al., 2018a). As such, the T-iPBI, like the original iPBI,

23   is highly applicable to a general population (Turner et al., 2018b), not just those

24   performing in formalized and structured organizations such as elite sports clubs (e.g.,

25   Wood, Barker, Turner, & Sheffield, 2018) or blue-chip companies (e.g., Turner &

1   Barker, 2015). Therefore, the development of the T-iPBI allows for the accurate

2   assessment of irrational beliefs in Thai-speaking populations for whom performance

3   is an everyday occurrence.

4   Second, research suggests that cultural background is an important

5   consideration for intervention effectiveness (Bernal & Saez-Santiago, 2006), and

6   indeed findings of past research that were once thought to be universal may be

7   culturally-bound (Hofstede, Hofstede, & Minkov, 2010). For example, REBT is used

8   globally across a variety of cultures (e.g., Lega & Ellis, 2001), but it should be

9   recognised that cultural influences can shape the expression of theory (e.g., Chang,

10   Arkin, Leong, Chan, & Leung, 2004). Therefore, not only does the translation of the

11   iPBI into Thai language provide a reliable measure for a Thai-speaking population, it

12   also helps to further validate the theory of REBT through construct validity testing in

13   this population. That is, the four core irrational beliefs that form the basis of the iPBI,

14   and that provided good model fit in the current study for the T-iPBI, are in line with

15   contemporary REBT theory.

16   A 20-item T-iPBI emerged from CFA analyses because the model fit for the

17   28-item T-iPBI was not satisfactory. It is possible that the full 28-item scale retained

18   too many items and failed to sieve unnecessary translated items out. The number of

19   instrument items being analyzed in CFA can negatively correlate with the model fit

20   (Kenny & McCoach, 2003). In order to achieve the best model fit, the T-iPBI was

21   shortened from 28-items to 20-items by removing items with low factor loadings from

22   each factor. The model was re-specified to fit the revised scale and the CFA was re-

23   run to evaluate the revised scale. Results confirmed that each of the four components

24   was well defined by its items and all factor loadings exceeded .50. The shortening of

25   the T-iPBI was necessary for psychometric validity, but collaterally is also beneficial

1   for the future use of the T-iPBI, because a shorter measure places less burden on

2   respondents. The 20-item T-iPBI has the advantage that researchers can assess a large

3   number of participants within a short testing time.

4   Concurrent validity was supported by the moderate-to-high correlations and

5   regression model comprising the T-iPBI subscales and the total irrational beliefs

6   measures using the IBT. Turner et al. (2018a) reported moderate to large correlations

7   between the iPBI subscales and the subscales of another measurement of irrational

8   beliefs, namely the Shortened General Attitudes and Beliefs Scale (SGABS; Lindner

9   et al., 1999). Contrary to our hypothesis, only half of the relationships between the

10   four subscales of the T-iPBI and ten subscales of the IBT were statistically significant

11   in the current study. For instance, only demand for approval, high self-expectation,

12   blame proneness, and helplessness for change subscales showed strong relationships

13   with the T-iPBI subscales. Whilst it is important to demonstrate concurrent validity, it

14   is possible that the IBT is outdated, contains too many subscales (DiGiuseppe, 1991;

15   Smith, 1989), and includes items that are no longer considered to be irrational beliefs

16   by contemporary theoretical standards (Dryden & Ellis, 1988). In particular, the

17   preferential statements of the original IBT reflect only preferences, rather than core

18   irrational processes and absolute thinking of irrationalities (Burgess, 1990). The

19   ability of the original IBT scale to distinguish between irrationality and negative

20   emotions has also been questioned since scores have been found to strongly correlate

21   with measures of depression and anxiety symptomology (Haaga & Davison, 1993).

22   Moreover, inadequate information was included in the study that produced the 60-

23   item Thai-translated version of the IBT, and therefore the current authors are unsure

24   about the validity of the item reduction process. This may in turn lead to unexpected

25   results when using the Thai-IBT, which could be reflected in the present study. We

suggest researchers use contemporary and contextually specific measures of irrational

beliefs in future research to ensure validity and reliability of measurement.

The predictive validity of the T-iPBI was supported through moderate positive

correlations between the subscales of the T-iPBI and symptoms of anxiety and

depression as measures using the Thai-HADS. These results are in line with the

original iPBI validation study (Turner et al., 2018a), in which composite irrational

beliefs measured using the iPBI was positively related to anxiety and depression

measured using the STPI. The complimentary results found in the current paper

indicate that the T-iPBI shows good predictive validity and is associated with

symptoms of anxiety and depression consistent with variety of non-performance

specific irrational beliefs measures (e.g., Terjesen, Salhany, & Sciutto, 2009).

As well as demonstrating concurrent and predictive validity, in the present

study the T-iPBI also demonstrated test-retest reliability. Scores across three time-

points remained stable as evidenced by ICC and MANOVA results, supporting recent

research showing that the iPBI has good test-retest reliability in athlete and student

populations (Turner et al., 2018b). The T-iPBI assesses trait constructs, rather than

state or affective constructs, and therefore should exhibit high test-retest reliability

(Widaman, Little, Preacher, & Sawalani, 2011). Indeed, the test-retest reliability

shown for the T-iPBI is also consistent with alternate measures such as the SGABS

(Lindner et al., 1999), which has demonstrated comparable test-retest reliability, and

in a study using an athlete sample, remained stable over an eight-week period (Turner

& Moore, 2016). Not only does test-retest reliability demonstrate good repeatability

of measurement, it also suggests that irrational beliefs are indeed traits that do not

change across relatively short periods of time. Research suggests that irrational beliefs

are lower in older participants (Ndika, Olagbaiye, & Agiobu-Kemmer, 2012; Turner

1   et al., 2016), but researchers have yet to examine whether irrational beliefs reduce

2   over long periods of time or whether generational differences can account for lower

3   irrational beliefs in older participants. Also, growing research shows that irrational

4   performance beliefs can be reduced using REBT, by engaging participants in

5   structured and meaningful disputation of irrational beliefs (see Turner, 2016, for a

6   review; Turner & Bennett, 2017). Future researchers should examine REBT

7   interventions in Thai samples using the T-iPBI to measure changes in irrational

8   beliefs over the intervention period using idiographic multiple-baseline across-

9   participant designs (e.g., Deen et al., 2017; Turner, Ewen, & Barker, 2018).

10   Despite the promising linguistic adaptation and cross-cultural validity results

11   presented in the current paper, it is important to consider the results as preliminary.

12   There are several limitations in the present study that need to be considered in the

13   interpretation of results. First, the number of participants did not allow for exploratory

14   factor analysis (EFA) prior to CFA. To explain, we assumed the we had a known

15   framework and we confirmed that the theoretical structure (four core irrational

16   beliefs) by conducting CFA without prior EFA. A larger sample (N = 250; Anthoine

17   et al., 2014) of Thai respondents would allow us to conduct EFA to ensure that the

18   structure of the T-iPBI conforms to the original iPBI. Third, participants in this study

19   were sampled among adult members and alumni of the Samaggi association, or were

20   acquaintances of the researchers on social networking sites. Whilst this population

21   sampling recruited a diverse sample, it was not a systematically randomized. The

22   main aims of the present study were to translate the iPBI into Thai language and to

23   test the validity and reliability of the T-iPBI in a Thai sample. Future researchers

24   should extend these aims and recruit more specific samples to examine the validity

1   and reliability of the T-iPBI in groups such as athletes (Turner & Allen, 2018),

2   occupational workers (Turner et al., 2018a), and students (Turner et al., 2018b).

3   The assessment of performance-related irrational beliefs has a major impact

4   on both clinical practice and research in performance setting. In a clinical practice, an

5   effective psychological intervention to increase individual's performance depends on

6   an accurate identification of irrational cognitive processes and contents related to

7   problems. Being able to identify problematic cognitive mechanisms correctly can help

8   clients to adhere to the psychotherapeutic process. From a research perspective,

9   distinguishing different types of thought content and processes can help researchers

10 develop efficient intervention techniques and models of change in different settings.

11 In an East Asian culture, rationality is also highly valued as the essence of human life.

12 However, spectrums of rationality and irrationality are slightly different between the

13 East Asian notion and the terms used in the Western style psychotherapy (Chen,

14 1995). Therefore, the applicability of iPBI to people with a Thai or East Asian

15 cultural background will help implement mainstream Western psychotherapies into

16 Eastern cultures. The potential for using the T-iPBI and future derivative translations

17 in other Asian languages seems promising.

18   In summary, this study demonstrates that the Thai version of iPBI, the T-iPBI,

19 is a linguistically and psychometrically valid instrument for the measurement of

20 irrational performance beliefs. The assessment of irrational beliefs in Thai populations

21 using the T-iPBI might help researchers and practitioners identify Thai people at risk

22 of anxiety and depression. Moreover, the application of REBT within Thai samples is

23 now bolstered with a contemporary Thai-language measure of irrational beliefs. As

24 such, the authors encourage practitioners working with Thai clients to use the T-iPBI

1   to evaluate intervention effects and to report their findings to the wider academic

2   community.

3   **Conflict of Interest**: Authors A and B declare that they have no conflict of interest.

4   **Ethical approval**: All procedures performed in studies involving human participants

5   were in accordance with the ethical standards of the institutional research committee

6   and with the 1964 Helsinki declaration and its later amendments or comparable

7   ethical standards.

8   **Informed consent**: Informed consent was obtained from all individual participants

9   included in the study.

10   **References**

11   Allen, M. S., El-Cheikh, S., & Turner, M. J. (2017). A longitudinal investigation of

12   irrational beliefs, hedonic balance and academic achievement. *Learning and*

13   *Individual Differences*, *58*, 41-45. https://doi.org/10.1016/j.lindif.2017.07.003

14   Arip, M. (2016). The effect of REBT Structured Group Counselling towards the

15   psychology aspects of adolescents of divorced parent. *Advances in*

16   *Environmental Biology*, *10*(4), 44-50.

17   Anthoine, E., Moret, L., Regnault, A., Sébille, V., & Hardouin, J. B. (2014). Sample

18   size used to validate a scale: a review of publications on newly-developed

19   patient reported outcomes measures. *Health and quality of life outcomes*, *12*(1),

20   2. https://doi.org/10.1186/s12955-014-0176-2

21   Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological*

22   *bulletin*, *107*(2), 238. https://doi.org/10.1037/0033-2909.107.2.238

23   Bernal, G., & Saez-Santiago, E. (2006). Culturally centred psychosocial interventions.

24   *Journal of Community Psychology*, *34*, 121-132.

Bjelland, I., Dahl, A. A., Haug, T. T., & Neckelmann, D. (2002). The validity of the
Hospital Anxiety and Depression Scale: an updated literature review. *Journal of
psychosomatic research*, *52*(2), 69-77. https://doi.org/10.1016/S0022-
3999(01)00296-3

Borkovec, T. D., Ray, W. J., & Stober, J. (1998). Worry: A cognitive phenomenon
intimately linked to affective, physiological, and interpersonal behavioral
processes. *Cognitive Therapy and Research*, *22*(6), 561-576.
https://doi.org/10.1023/A:1018790003416

Bridges, K. R., & Harnish, R. J. (2010). Role of irrational beliefs in depression and
anxiety: a review. *Health*, *2*(08), 862. https://doi.org/10.4236/health.2010.28130

Burgess, P. (1986). *Belief systems and emotional disturbance: Evaluation of the
rational emotive model.* Unpublished doctoral dissertation. University of
Melbourne, Parkville, Melbourne, Australia.

Burgess, P. (1990). Toward resolution of conceptual issues in the assessment of belief
systems in rational-emotive therapy. *Journal of Cognitive Psychotherapy, 4*(2),
171-183.

Chang, E. C. (1996). Evidence for the cultural specificity of pessimism in Asians vs
Caucasians: A test of a general negativity hypothesis. *Personality and
Individual Differences*, *21*(5), 819-822. https://doi.org/10.1016/0191-
8869(96)00110-9

Chang, L., Arkin, R. M., Leong, F. T., Chan, D. K. S., & Leung, K. (2004).
Subjective overachievement in American and Chinese college students. *Journal
of Cross-Cultural Psychology*, *35*, 152-173.

Chang, E. C., & Bridewell, W. B. (1998). Irrational beliefs, optimism, pessimism, and
psychological distress: A preliminary examination of differential effects in a

college population. *Journal of clinical psychology*, *54*(2), 137-142.

https://doi.org/10.1002/(SICI)1097-4679(199802)54:2<137::AID-

JCLP2>3.0.CO;2-P

Chen, C. P. (1995). Counseling applications of RET in a Chinese cultural

context. *Journal of rational-emotive and cognitive-behavior therapy*, *13*(2),

117-129. https://doi.org/10.1007/BF02354457

Cockerill, I. (2002). In pursuit of the perfect performance. In I. Cockerill (Ed.),

Solutions in sport psychology (pp. 74–88). London: Thomson.

Deen, S., Turner, M. J., & Wong, R. S. (2017). The Effects of REBT, and the Use of

Credos, on Irrational Beliefs and Resilience Qualities in Athletes. *The Sport

Psychologist*, 1-39. https://doi.org/10.1123/tsp.2016-0057

DeVellis, R. F. (2012). *Scale development: Theory and applications*. Thousand Oaks,

CA: Sage

DiGiuseppe, R. (1991). Comprehensive cognitive disputing in RET. In M. E. Bernard

(Ed.), *Using rational-emotive therapy effectively: A practitioner's guide* (pp.

173-195). New York, NY: Plenum. https://doi.org/10.1007/978-1-4899-0641-

0_7

Dixon, M., Turner, M. J., & Gillman, J. (2017). Examining the relationships between

challenge and threat cognitive appraisals and coaching behaviours in football

coaches, *Journal of Sports Sciences*, *35*(24), 2446-2452

Dryden, W. (2014). *Rational emotive behaviour therapy: Distinctive features*. New

York, NY: Routledge.

Dryden, W., & Branch, R. (2008). *Fundamentals of rational emotive behaviour

therapy: A training handbook*. Hoboken, NJ: John Wiley & Sons.

Dryden, W., & Ellis, A. (1988). Rational-emotive therapy. In K. S. Dobson (Ed.),

Handbook of cognitive-emotive behavioral therapies. New York, NY: The

Guilford Press.

Ellis, A. (1957). Outcome of employing three techniques of psychotherapy. *Journal of*

Clinical Psychology, 13, 344-350. https://doi.org/10.1002/1097-

4679(195710)13:4<344::AID-JCLP2270130407>3.0.CO;2-9

Ellis, A. (1994). The sport of avoiding sports and exercise: A rational emotive

behavior therapy perspective. *The Sport Psychologist*, *8*(3), 248-261.

https://doi.org/10.1123/tsp.8.3.248

Ellis, A. (2002). *Overcoming resistance: A rational emotive behavior therapy*

integrated approach. New York, NY: Springer Publishing Company.

Ellis, A., & Dryden, W. (2007). *The practice of rational emotive behavior therapy*.

New York, NY: Springer publishing company.

Haaga, D. A. F., & Davison, G. C. (1993). An appraisal of rational-emotive therapy.

Journal of Consulting and Clinical Psycho logy, 61, 215-220.

https://doi.org/10.1037/0022-006X.61.2.215

Hofstede, G., Hofstede, G. J., & Minkov, M. (2010). *Cultures and organisations.*

Software of the mind. Interculture cooperation and its importance for survival

(3rd ed.). New York: McGraw Hill.

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance

structure analysis: Conventional criteria versus new alternatives. *Structural*

equation modeling: a multidisciplinary journal, *6*(1), 1-55.

https://doi.org/10.1080/10705519909540118

Jarrett, T. A. (2013). Warrior resilience and thriving (WRT): Rational emotive

behavior therapy (REBT) as a resiliency and thriving foundation to prepare

warriors and their families for combat deployment and posttraumatic growth in Operation Iraqi Freedom, 2005–2009. *Journal of Rational-Emotive & Cognitive-Behavior Therapy*, *31*(2), 93-107. https://doi.org/10.1007/s10942-013-0163-2

Jones, R. G. (1968). A factored measure of Ellis' irrational belief system with personality and maladjustment correlates (Doctoral dissertation). Retrieved from https://ttu-ir.tdl.org/ttu-ir/bitstream/handle/2346/18941/31295005090260.pdf?sequence=1

Kenny, D. A., & McCoach, D. B. (2003). Effect of the number of variables on measures of fit in structural equation modeling. *Structural equation modeling*, *10*(3), 333-351. https://doi.org/10.1207/S15328007SEM1003_1

Lega, L. I., & Ellis, A. (2001). Rational Emotive Behavior Therapy (REBT) in the new millenium: A cross-cultural approach. *Journal of Rational-Emotive & Cognitive-Behavior Therapy*, *19*(4), 201-222. https://doi.org/10.1023/A:1012537814117

Lindner, H., Kirkby, R., Wertheim, E., & Birch, P. (1999). A brief assessment of irrational thinking: The shortened general attitude and belief scale. *Cognitive Therapy and Research*, *23*(6), 651-663. https://doi.org/10.1023/A:1018741009293

Lohr, J. M., & Bonge, D. (1980). Retest Reliability of the Irrational Beliefs Test. *Psychological Reports*, *47*, 1314. https://doi.org/10.2466/pr0.1980.47.3f.1314

Malouff, J. M., & Schutte, N. S. (1986). Development and validation of a measure of irrational belief. *Journal of Consulting and Clinical Psychology, 54,* 860-862. https://doi.org/10.1037/0022-006X.54.6.860

Mat Roni, S. (2014). Introduction to SPSS. *Edith Cowan University, SOAR Centre, Australia.*

Ndika, N. A., Olagbaiye, F., & Agiobu-Kemmer, I. (2009). Age Differences in Irrational Beliefs, Self-Efficacy and Self-Confidence of Adolescents in a Nigerian Secondary School. *Psychology and Education*, *46*(3), 16.

Nilchaikovit, T., Lotrakul, M., & Phisansuthideth, U. (1996). Development of Thai version of Hospital Anxiety and Depression Scale in cancer patients. *Journal of Psychiatric Association Thai*, *41*(1), 18-30.

Nunnally J. C., & Bernstein I. H. (1994). *Psychometric theory* (3rd ed.). New York, NY: McGrawHill.

Ruangjun, A. (1996). Relationship between cognition and academic achievement of nursing student of Budhachinaraj Nursing College. Retrieved from http://cmuir.cmu.ac.th/handle/6653943832/29565.

Shannon, H. D., & Allen, T. W. (1998). The effectiveness of a REBT training program in increasing the performance of high school students in mathematics. *Journal of Rational-Emotive and Cognitive-Behavior Therapy*, *16*(3), 197-209. https://doi.org/10.1023/A:1024963131417

Shorkey, C. T., & Whiteman, V. L. (1977). Development of the Rational Behavior Inventory: Initial validity and reliability. *Educational and Psychological Measurement*, *37*(2), 527-534. https://doi.org/10.1177/001316447703700232

Shoukri, M. M., Asyali, M. H., & Donner, A. (2004). Sample size requirements for the design of reliability study: review and new results. *Statistical Methods in Medical Research*, *13*(4), 251-271.

Si, G., & Lee, H. C. (2008). Is it so hard to change? The case of a Hong Kong
    Olympic silver medalist. *International Journal of Sport and Exercise
    Psychology*, *6*(3), 319-330. https://doi.org/10.1080/1612197X.2008.9671876

Smith, T. W. (1989). Assessment in Rational-Emotive Therapy: Empirical access to
    the ABCD-model. In M.E. Bernard & R. DiGuiseppe (Eds.), *Inside rational-
    emotive therapy: A critical appraisal of the theory and therapy of Albert Ellis*
    (pp. 135-154). San Diego, CA: Academic Press. https://doi.org/10.1002/1097-
    4679(198311)39:6<976::AID-JCLP2270390627>3.0.CO;2-X

Spielberger, C. D. (1979). *Preliminary manual for the State-Trait Personality
    Inventory*. Unpublished manual, University of South Florida, Tampa.

Turner, M. J. (2016). Rational Emotive Behavior Therapy (REBT), irrational and
    rational beliefs, and the mental health of athletes. *Frontiers in psychology*, *7*,
    1423. https://doi.org/10.3389/fpsyg.2016.01423

Turner. M. J., & Allen, M. (2018). Confirmatory factor analysis of the irrational
    Performance Beliefs Inventory (iPBI) in a sample of amateur and semi-
    professional athletes. *Psychology of Sport and Exercise, 35*, 126-130.
    https://doi.org/10.1016/j.psychsport.2017.11.017

Turner, M. J., Allen, M. S., Slater, M. J., Barker, J. B., Woodcock, C., Harwood, C.
    G., & McFayden, K. (2018a). The development and initial validation of the
    irrational performance beliefs inventory (iPBI). *European Journal of
    Psychological Assessment*. *34*, 174-180. https://doi.org/10.1027/1015-
    5759/a000314

Turner, M. J., & Barker, J. B. (2013). Examining the efficacy of rational-emotive
    behavior therapy (REBT) on irrational beliefs and anxiety in elite youth

cricketers. *Journal of Applied Sport Psychology*, *25*(1), 131-147.

https://doi.org/10.1080/10413200.2011.574311

Turner, M. J., & Barker, J. B. (2014). Using rational emotive behavior therapy with

athletes. *The Sport Psychologist*, *28*(1), 75-90. https://doi.org/10.1123/tsp.2013-

0012

Turner, M. J., & Barker, J. B. (2015). Examining the effects of rational emotive

behavior therapy (REBT) on the irrational beliefs of blue-chip professionals.

Journal of Rational-Emotive & Cognitive-Behavior Therapy, *33*(1), 17-36.

https://doi.org/10.1007/s10942-014-0200-9

Turner, M. J., & Bennett, R. (2018). R*ational Emotive Behaviour Therapy in Sport*

and Exercise. Routledge.

Turner, M. J., Carrington, S., & Miller, A. (in press). Psychological distress across

sport participation groups: The mediating effects of secondary irrational beliefs

on the relationship between primary irrational beliefs and symptoms of anxiety,

anger, and depression. *Journal of Clinical Sport Psychology*.

Turner, M. J., Ewen, D., & Barker, J. B. (in press). An idiographic single-case study

examining the use of Rational Emotive Behavior Therapy (REBT) with three

amateur golfers to alleviate sport performance phobias. *Journal of Applied*

Sport Psychology. Accepted 29th June 2018.

Turner, M. J., & Moore, M. (2016). Irrational beliefs predict increased emotional and

physical exhaustion in Gaelic football athletes. *International journal of sport*

psychology, *47*(2), 187-201.

Turner, M. J., Slater, M. J., & Barker, J. B. (2014). The season-long effects of rational

emotive behavior therapy on the irrational beliefs of professional academy

soccer athletes, *International Journal of Sport Psychology, 5*, 429-451.

Turner, M. J., Slater, M. J., Dixon, J., & Miller, A. (2018b). Test–retest reliability of

the irrational performance beliefs inventory. *European journal of sport science*,

18(1), 123-129. https://doi.org/10.1080/17461391.2017.1411527

Vîslă, A., Flückiger, C., Grosse Holtforth, M., & David, D. (2016). Irrational beliefs

and psychological distress: a meta-analysis. *Psychotherapy and*

psychosomatics, *85*(1), 8-15. https://doi.org/10.1159/000441231

Widaman, K. F., Little, T. D., Preacher, K. J., & Sawalani, G. M. (2011). On creating

and using short forms of scales in secondary research. In K. H. Trzesniewski,

M. B. Donnellan, & R. E. Lucas (Eds.), *Secondary data analysis: An*

introduction for psychologists (pp. 39–62). Washington, DC: American

Psychological Association. https://doi.org/10.1037/12350-003

Wild, D., Grove, A., Martin, M., Eremenco, S., McElroy, S., Verjee-Lorenz, A., &

Erikson, P. (2005). Principles of good practice for the translation and cultural

adaptation process for patient-reported outcomes (PRO) measures: report of the

ISPOR task force for translation and cultural adaptation. *Value in health*, *8*(2),

94-104. https://doi.org/10.1111/j.1524-4733.2005.04054.x

Wood, A. G., Barker, J. B., Turner, M., & Sheffield, D. (2018). Examining the Effects

of Rational Emotive Behavior Therapy (REBT) on Performance Outcomes in

Elite Paralympic Athletes. *Scandinavian Journal of Medicine & Science in*

Sports, *28*(1), 329-339. doi: 10.1111/sms.12926

Zigmond, A. S., & Snaith, R. P. (1983). The hospital anxiety and depression

scale. *Acta psychiatrica scandinavica*, *67*(6), 361-370.

https://doi.org/10.1111/j.1600-0447.1983.tb09716.x

1 Table 1. General characteristics of participants by gender
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	Male *N=61* % (n)	Female *N=104* % (n)	Rather not say *N=1* % (n)	Total *N=166* % (n)
Age (years)	31.13 ± 6.33	31.09 ± 7.80	28.00 ± 0.00	31.08 ± 7.25
Education				
High school	4.91 (3)	6.73 (7)	0.00 (0)	6.02 (10)
Undergraduate	40.98 (25)	54.81 (57)	100.00 (1)	50.00 (83)
Postgraduate	54.10 (33)	38.46 (40)	0.00 (0)	43.98 (73)

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Table 2. Means, Standard Deviations, and Intercorrelation of Variables

Factor	M	SD	T-iPBI	PIB	LFT	AWF	DEP	IBT	HADS-A	HADS-D
T-iPBI	65.24	12.48	(.90)							
PIB	15.90	2.81	.55^a***	(.72)						
LFT	14.29	3.49	.68^a***	.50***	(.81)					
AWF	20.75	4.58	.67^a***	.56***	.66***	(.82)				
DEP	14.31	5.01	.48^a***	.32***	.46***	.42***	(.82)			
IBT (Thai)	215.02	16.65	.39***	.36***	.30***	.44***	.15*	(.80)		
HADS-A (Thai)	6.69	3.61	.35***	.17*	.33***	.27**	.31***	.16*	(.81)	
HADS-D (Thai)	4.11	3.37	.35***	.17*	.32***	.25**	.31***	.13	.71***	(.79)

$N = 166$. ^a Correlation between T-iPBI subscales and total scores from 20 items were computed with the subscale removed from the total score. Cronbach's alphas are shown in the diagonal. T-iPBI = Thai version of Irrational Performance Beliefs Inventory; PIB = Personal Irrational Beliefs; LFT = Low Frustration Tolerance; AWF = Awfulizing; DEP = Depreciation; IBT = Irrational Beliefs Test; HADS-A = Hospital Anxiety and Depression Scale – Anxiety Subscale; HADS-D = Hospital and Depression Scale – Depression Subscale.
*** $p < .001$
** $p < .01$
* $p < .05$

Table 3. Correlations between the T-iPBI Subscales and the Thai Version of the IBT Subscales

Factor	M	SD	PIB	LFT	AWF	DEP	T-iPBI
IBT (Thai version)	215.02	16.65	.36***	.30***	.44***	.15	.39***
Demand for approval	19.86	2.69	.42***	.36***	.38***	.17*	.41***
High self expectation	22.07	2.48	.25**	.39***	.38***	.05	.33***
Blame proneness	22.45	3.15	.28***	.28***	.36***	.12	.32***
Frustration reactive	21.73	2.59	.06	-.09	.04	-.09	-.03
Emotional irresponsibility	23.87	3.04	.19*	.07	.11	-.16*	.04
Anxious over-concern	20.11	2.78	.17*	.17*	.19*	.21**	.24**
Problem avoidance	18.13	2.86	.11	.11	.22**	.12	.19*
Dependency	24.07	2.84	.27**	.16*	.36***	.07	.27**
Helplessness for change	20.13	2.98	.21**	.27**	.36***	.29***	.37***
Perfectionism	22.61	2.69	.17*	.07	.18*	.07	.15

N = 166. T-iPBI = Thai version of Irrational Performance Beliefs Inventory; PIB = Personal
Irrational Beliefs; LFT = Low Frustration Tolerance; AWF = Awfulizing; DEP =
Depreciation; IBT = Irrational Beliefs Test.
*** *p* < .001
** *p* < .01
* *p* < .05

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Table 4. Correlations between T-iPBI (Time 1), (Time 2), and (Time 3), and ICC Results

Time 1	Time 2					Time 3					ICC		
	T-iPBI	PIB	LFT	AWF	DEP	T-iPBI	PIB	LFT	AWF	DEP	ICC	95% CI	F
T-iPBI	$.82^{***}$	$.50^{***}$	$.67^{***}$	$.73^{***}$	$.85^{***}$	$.85^{***}$	$.71^{***}$	$.65^{***}$	$.76^{***}$	$.73^{***}$	$.95^{***}$	.90 - .97	18.35
PIB	$.59^{***}$	$.75^{***}$	$.42^{*}$	$.53^{**}$	$.38^{*}$	$.57^{***}$	$.73^{***}$	$.36^{*}$	$.49^{**}$	$.44^{**}$	$.90^{***}$	.82 - .95	9.92
LFT	$.61^{***}$	$.27^{ns}$	$.65^{***}$	$.57^{***}$	$.48^{**}$	$.67^{***}$	$.56^{**}$	$.78^{***}$	$.59^{***}$	$.42^{*}$	$.90^{***}$	.80 - .94	8.89
AWF	$.74^{***}$	$.44^{**}$	$.64^{***}$	$.70^{***}$	$.63^{***}$	$.74^{***}$	$.65^{***}$	$.57^{***}$	$.82^{***}$	$.49^{**}$	$.93^{***}$	.87 - .96	13.51
DEP	$.67^{***}$	$.27^{ns}$	$.46^{**}$	$.54^{**}$	$.79^{***}$	$.73^{***}$	$.45^{**}$	$.43^{**}$	$.56^{**}$	$.84^{***}$	$.93^{***}$	.87 - .96	13.71

$N = 33$. T-iPBI = Thai version of Irrational Performance Beliefs Inventory; PIB = Personal Irrational Beliefs; LFT = Low Frustration Tolerance; AWF = Awfulizing; DEP = Depreciation; ICC = Interclass Correlation Coefficients.
$^{***} p < .001$
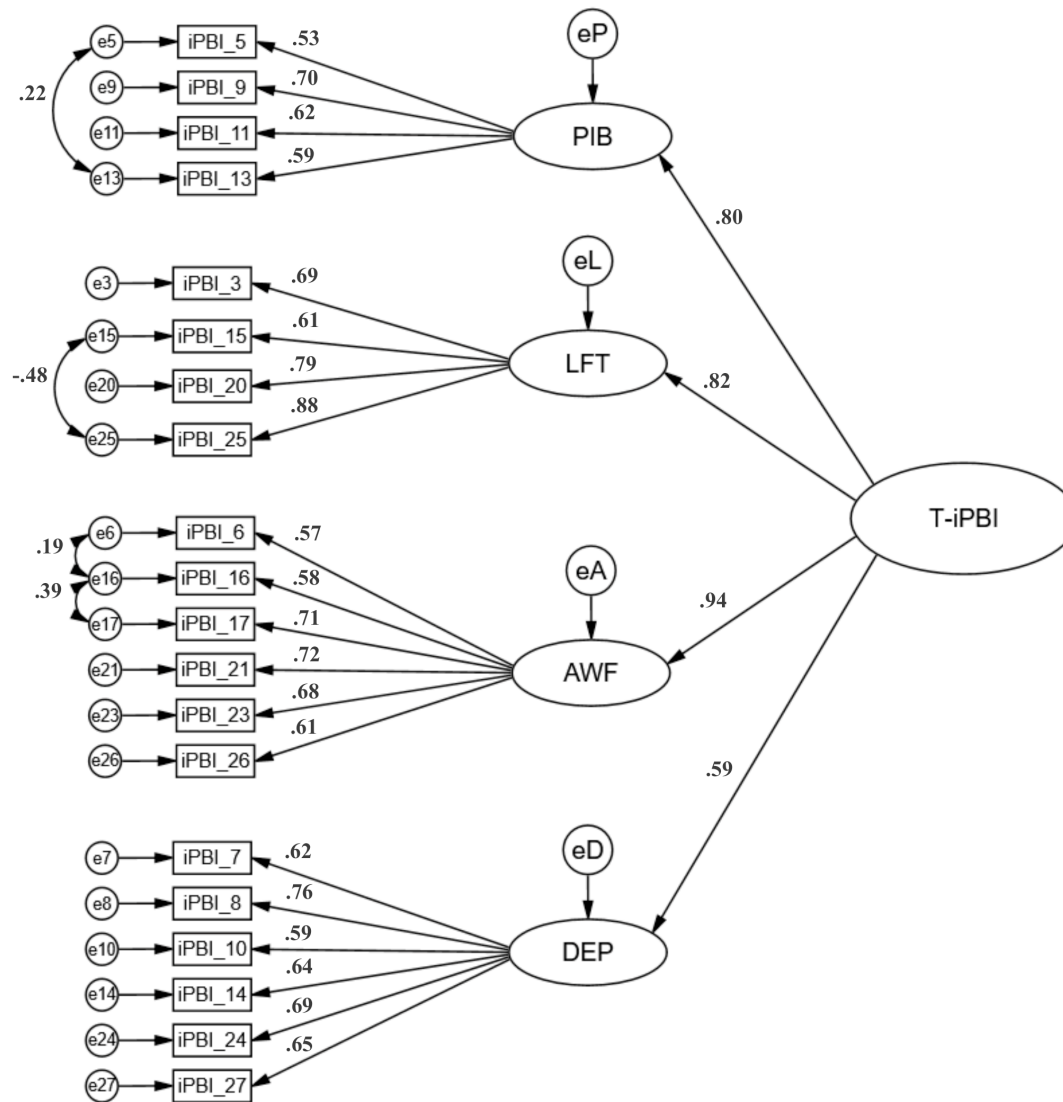$^{**} p < .01$
$^{*} p < .05$
$^{ns} p > .05$

Figure 1.   The Thai version of the Irrational Performance Beliefs Inventory second-order confirmatory factor analysis path diagram indicating the four first-order factors loading onto a single second-order T-iPBI factor. Standardized regression weights and covariances are shown on a diagram.

Figure 2. The final 20-item T-iPBI

แบบสำรวจความเชื่อของการกระทำที่ไร้เหตุผล ฉบับ 20 ข้อ

โปรดอ่านข้อความในแต่ละข้อ และพิจารณาเลือกคำตอบซึ่งตรงกับความรู้สึก และความเป็นจริงของท่านมากที่สุด

โดยเพียงเลือกเพียงคำตอบเดียวเท่านั้นต่อข้อ และกรุณาตอบทุกข้อ

(ไม่เห็นด้วยอย่างมาก(1) - ไม่เห็นด้วยเล็กน้อย(2) - รู้สึกเป็นกลาง(3) - เห็นด้วยเล็กน้อย(4) - เห็นด้วยอย่างมาก(5))

1) ฉันทนไม่ได้ถ้าฉันต้องล้มเหลวในเรื่องที่สำคัญต่อฉันมาก

2) ฉันต้องการให้คนที่มีความสำคัญต่อฉัน มองฉันอย่างชื่นชม

3) การที่คนอื่นไม่ให้โอกาสฉัน มันเป็นเรื่องที่แย่มาก

4) หากการตัดสินใจที่มีผลกระทบต่อฉันไม่มีเหตุผลอันควร นั่นแสดงว่าฉันเป็นคนไร้ค่า

5) หากฉันไม่ได้รับโอกาส นั่นแสดงว่าฉันเป็นคนที่ไม่มีค่าพอ

6) ฉันต้องการให้คนอื่นคิดว่าฉันได้ทำสิ่งที่มีคุณค่า

7) ฉันเป็นคนขี้แพ้ หากฉันไม่ประสบความสำเร็จในสิ่งที่มีความสำคัญต่อฉัน

8) ฉันต้องได้รับความเคารพจากสมาชิกในทีมงานของฉัน

9) ฉันไม่ควรถูกดูหมิ่นดูแคลน จากคนที่ฉันให้ความสำคัญ

10) หากตำแหน่งของฉันในทีมไม่มั่นคง นั่นแสดงให้เห็นว่าฉันไร้ค่า

11) ฉันทนไม่ได้ที่จะไม่ได้รับโอกาส

12) การไม่ได้รับการปฏิบัติอย่างเป็นธรรมจากเพื่อนของฉัน นับเป็นเรื่องที่เลวร้าย

13) การที่สมาชิกในทีมไม่เคารพฉัน นับเป็นเรื่องที่เลวร้าย

14) ฉันทนไม่ได้หากล้มเหลวในสิ่งที่สำคัญต่อฉัน

15) การที่คนอื่นไม่ยอมรับฉัน นับเป็นเรื่องที่เลวร้าย

16) การที่เพื่อนๆของฉันทอดทิ้งฉัน นับเป็นเรื่องที่เลวร้าย

17) หากความสามารถของฉันไม่พัฒนาและถูกปรับปรุงให้ดีขึ้นอย่างต่อเนื่อง นั่นแสดงว่าฉันเป็นคนล้มเหลว

18) ฉันทนไม่ได้ หากไม่ประสบความสำเร็จในสิ่งที่มีความสำคัญต่อฉัน

19) การที่ตำแหน่งของฉันในทีมไม่มั่นคง นับเป็นเรื่องที่เลวร้าย

20) หากคนอื่นคิดว่าฉันไม่เก่งในสิ่งที่ฉันทำ นั่นแสดงให้เห็นว่าฉันเป็นคนที่ไม่มีค่า

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