

PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Stoic Beliefs and Health: Development and Preliminary Validation of the Pathak-Wieten Stoicism Ideology Scale
AUTHORS	Pathak, Elizabeth; Wieten, Sarah; Wheldon, Christopher W.

VERSION 1 – REVIEW

REVIEWER	Katriina Whitaker University of Surrey, UK
REVIEW RETURNED	31-Mar-2017

GENERAL COMMENTS	<p>A key area requiring further clarity is around the Sample- this section is vague and sets off some alarm bells. Who were the sample? Where were they recruited from? What was the response rate?</p> <p>I also wonder whether it can be claimed that the paper outlines a theory of illness behaviour and help-seeking (Line 4/5, p5). The focus is on one element of a much wider array of factors influencing help-seeking.</p> <p>On p5, Line 16 several studies are cited to show that research has been conducted to elucidate the reasons behind 'patient delays' but there is no discussion of these findings, or whether stoicism features as a reason why people don't go to their doctor. I would recommend expanding this discussion to more clearly frame the rationale of the current study.</p> <p>Although the statistical section/ CFA appears sound to me, I would recommend expert statistical review by someone well versed in conducting CFA.</p> <p>Finally, the discussion section lacks any debate re the limitations of the present study.</p>
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REVIEWER	Kumi Hirokawa Baika Women's University
REVIEW RETURNED	19-Apr-2017

GENERAL COMMENTS	This manuscript reports the development of an original scale for stoicism, the "Pathak-Wieten Stoicism Ideology Scale" (PW-SIS). The authors report the results of investigations for factorial validity and content validity. The results of a confirmatory factor analysis show that the goodness of fit index for four factors with 12 items is of
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a sufficient level. The scores of the PW-SIS are positively correlated with a score of "trying to be a stoic." Several Cronbach's alphas among the four sub-scales are rather lower than recommended values but are of an acceptable level. There are gender differences and ethnic differences. I have a number of major questions about this manuscript that need to be resolved before publication

1. The main problem with this manuscript is the construction of the Introduction section, which is very vague and confusing. The authors' purpose in developing this scale seems to be to design an ideology scale for stoicism that should be predictive of inhibition in help-seeking behavior and of adverse health-related behavior. In the Introduction section, the authors explain the history and concept of stoicism. Instead, they should explain the possible role of stoicism in health-related behavior, the differences between health-related behavior (especially anti-help-seeking) and stoicism, and the differences between previous scales of stoicism and the PW-SIS (i.e., the originality of this study). Most of the material explained in the Discussion section (e.g., the Theoretical Context and Previous Research on Stoicism and Health) should be moved into the Introduction section.

2. When discussing the purposes of the scale, the authors explain that they intend to "discuss the potential usefulness of this tool for investigating constraints in health-related help-seeking behaviors." Regrettably, the authors do not examine in this study whether the scores of the PW-SIS are associated with health-seeking behavior or other health-related behaviors. The authors investigate only factorial validity and content validity. Looking at the 12 items, the items for "Stoic Endurance" may be related to pain, but other items seem to be related to "repressed emotion" and "less of a fear of death." I am not certain that the PW-SIS is constructively valid as it stands.

3. The authors explain in the Method section that the PW-SIS has five domains: "Stoic Taciturnity," "Stoic Endurance," "Stoic Composure," "Stoic Serenity," and "Stoic Death Indifference." I cannot understand process about why and how the authors have defined the PW-SIS, which should be predictive of health-related behavior, as consisting of these five domains.

4. Results: There may be significant differences between men and women in the sub-scores. In Table 2, the results for men and women should be detailed, as well as the totals. In the results in Table 3, the odds ratios are detailed, but the scores for the PW-SIS are continuous variables and do not have any cut-off values. The authors should use the appropriate statistical methods to reveal the associations between sociodemographic variables and scores on the PW-SIS. Means and SDs of totals and sub-scores for each sociodemographic variable should be detailed in Table 3.

5. In the Discussion section, the limitations of the research should be discussed. As already pointed out above, most of the material in the Discussion section should be in the Introduction section. The authors should discuss the results they found in the present study. For example, they should consider why there are significant differences between men and women, and between ethnicities.

REVIEWER	Zhen Wang Mayo Clinic, USA
REVIEW RETURNED	19-Apr-2017

GENERAL COMMENTS	<p>In this study, the authors developed a preliminary 5-domain Pathak-Wieten Stoicism Ideology Scale to assess stoic ideologies. 390 adults were recruited and surveyed to validate the scale. I have a few comments and suggestions for the current manuscript.</p> <ol style="list-style-type: none"> 1. The Introduction section is quite vague. Background information for readers who are not familiar with the area is missing, especially the theory behind the development of the scale is missing. The authors may move some parts of the discussion to the background and add more contents there. 2. I would like to see a table of characteristics of study participants to supplement the description in the results. 3. Methods, in Step 1, 6 items were dropped based on one statement "I try to be a stoic"? It seems quite inadequate. Please explain more. 4. Two decimal points for p value is typically enough. 5. Please add a limitation section to the discussion.
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REVIEWER	Silia Vitoratou Institute of Psychiatry, Psychology and Neurosciences, King's College, London, UK.
REVIEW RETURNED	10-May-2017

GENERAL COMMENTS	<p>This is a very well written manuscript and the statistical analysis was conducted very carefully. There are however some points that worry me and I do hope that the authors will be able to clarify. Please find below these points of consideration.</p> <ol style="list-style-type: none"> 1. The rating scale goes from -2 to +2. I wonder what are the implications of the negative scoring. Most commonly a Likert type scale would be used in this context (say from 1 to 5). Low scores then indicate one direction and high scores the other. It is not obvious to me what is the justification of penalising for low scores. Essentially, when a responder reports in one item "disagree", this response cancels out a potential "agree" response in a second item. While in the context of Educational Testing that would be considered desirable (say to avoid random responders, with the responders being usually informed about this practice before hand) I really do not see how this serves the purpose of measuring the latent trait here. In fact I think it is problematic. Could the authors provide a justification accompanied by a suitable reference to support this choice? I would be also very curious to see if things change in terms of reliability and factor structure by using the popular Likert scale instead. 2. The authors report on CFA but they also mention rotation. I am not familiar with SAS and whether it uses rotation techniques in CFA. Rotation is necessary in an EFA setting but I have never seen it being used in CFA so far, in other software. There might be something I am missing here, could the authors please specify which SAS PROC they used and direct us to proper documentation which supports the function SAS uses for rotation in CFA? I did try to find it but my research was fruitless. There must be something I am missing here. 3. For item selection, the authors report that a correlation matrix was used, but no other details are given in the results section. I would
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	<p>strongly recommend at the initial stages the authors to take under consideration the item-total correlations, and the alpha if item deleted, along with the inter-item correlations for item selection. I do agree with the loadings' strategy used at a later stage of the analysis though.</p> <p>4. And a final point. The desired analysis strategy when it comes to a newly developed scale is to report both on EFA and CFA. This requires a random split of the sample (as the two methods cannot be applied in the same sample) and thus many times we need to choose one of the two techniques. As early as stage 2 however, that is before CFA, the items are reduced to 18. That leaves enough data to report on both EFA and CFA. CFA then could be used to test a) the unidimensional model, b) the EFA suggested model, and c) the theory driven model. With this amount of data there is no reason not to split the sample in half and conduct both methods. EFA could also identify cross-loadings, which is important and cannot be seen with CFA only.</p> <p>I am looking forward to seeing a revised version of this manuscript and the authors' feedback especially in points 1 and 2.</p>
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VERSION 1 – AUTHOR RESPONSE

Introduction

Per the comments and suggestions of Reviewers 1, 2, and 3, we extensively re-organized the Introduction as follows:

- We moved the literature review sections on “Previous Research on Stoicism and Health” and “Theoretical Context” from the Discussion to the Introduction.
- We removed 2 long paragraphs on our theory of stoicism and constraints on health-related behaviors from the Introduction and included them in the Discussion, under “Directions for Future Research.”
- Due to inadequate communication on our part, Reviewer 2 (Comment 2) misunderstood the fundamental purpose of the PW-SIS. The purpose of the scale is only to measure stoic ideologies, not to measure health behavior or help-seeking. We made the following edits to the final paragraph of the Introduction to clarify the purpose:
 - o “... and discuss the potential usefulness of this tool for investigating predicting constraints in health-related help-seeking behaviors.”
 - o NEW SENTENCE: “The PW-SIS is a generalized scale which assesses stoic beliefs and sense of self but does not explicitly measure health behaviors or health outcomes.”

Methods

- Under “Data Collection,” we clarified sample selection and recruitment methods per Reviewer 1. We were unable to calculate a response rate because of our recruitment methods.
- Comment 3 from Reviewer 2 stems from the confusion about the purpose of the PW-SIS, which we clarified in the revised Introduction. As explained under “Conceptual Development of the Stoicism

Ideology Scale,” the initial 5 domains were chosen to reflect classical and modern dimensions of stoic philosophy.

□ Comment 4 from Reviewer 2 relates to the logistic regression methods employed in our analysis. The reviewer is correct that the PW-SIS score is a continuous variable. For the logistic analysis, we categorized this variable dichotomously based on the 75th percentile of the distribution. This is a very common analytic strategy. As we had previously explained in the Results section:

“There is no a priori cutpoint designated as “highly stoic” in the PW-SIS; in this analysis the cutpoint used was a mean score greater than the 75th percentile of the overall response distribution.”

We further clarified our methods by adding the following sentence to the “Data Analyses” section under Methods:

“For the logistic regression analysis, we categorized the outcome using the top quartile of the overall distribution of responses to represent strong endorsement of stoicism.”

As requested, we did revise Figure 3 to include the gender-specific PW-SIS overall scores with 95% confidence intervals. However, we did not add the score and sub-score means for all demographic variables to Table 3. Our study was not powered to examine stoic domain sub-scores for racial-ethnic and other demographic groups. The logistic results have the advantage of multivariate control of confounding. However, as we are careful to describe in the paper, the logistic results are exploratory only, with very wide confidence intervals for most estimates.

□ Comment 3 from Reviewer 3 requests further details on the item reduction process. These details and scientific rationale for eliminating the “Stoic Composure” domain were previously provided in the Technical Supplement, paragraph 1.

□ Comment 1 from Reviewer 4 raises concerns about the rating scale for the PW-SIS and potential negative bias influence on the respondents. We have edited the section “Conceptual Development of the Stoicism Ideology Scale” to clarify and correctly report our methods. The relevant new sentences are here:

“The participant version of the scale (pen-and-paper questionnaire) listed response codes of 0 (disagree) through 4 (agree). These responses were re-coded during analysis to range from -2 (disagree) to +2 (agree).”

We agree with Reviewer 4 that a negative coding number on a participant questionnaire would be a bad idea, and regret that we did not clearly communicate our methods previously. However, for analysis purposes, we intentionally re-coded so that a respondent who responded “not sure” to all 12 items would have a score of 0, reflecting neutrality on stoicism.

□ Comments 2, 3, and 4 from Reviewer 4 concern our confirmatory factor analysis methods.

o We used SAS PROC CALIS for the CFA. We revised our description to include this information, and also deleted the mention of rotation which was included in error.

o We respectfully disagree that exploratory factor analysis is appropriate for an explicitly defined multi-domain scale such as the PW-SIS. All of the preliminary 24 items were chosen to exemplify specific sub-domains under the umbrella of stoicism, not stoicism in general. Our only interest was in determining whether our theoretically-derived domains were supported by empirical testing.

o Variations in approach to item reduction are present in the literature, but we are very comfortable with the approach we took and it is well-supported by previous research and methodological guidance. The details we provide in the Technical Supplement show

that the factor loadings for all retained items were very robust. Parsimony was a strong concern for us - our intent was to create a scale that would be widely adopted by other researchers. The final scale achieves balance and brevity with 3 items for each of 4 domains.

Results

Comment 4 from Reviewer 2 - We agree that a detailed analysis of gender variation for each of the stoicism sub-scores would be of interest. This is an area of research that we hope to pursue in future studies that recruit larger, more representative samples. The main purpose of this paper is to present the theoretical and empirical justification for investigating stoicism and health, and to present the PW-SIS and its preliminary validation data.

Comment 2 from Reviewer 3 - We have added a new Table 1 in response to this request, and renumbered the remaining tables.

Comment 4 from Reviewer 3 - We prefer to retain the p value of 0.048 to clearly indicate that the value was < 0.05.

Discussion

Per request of Reviewers 1, 2, and 3, a “Study Limitations” section was added to the Discussion.

Per comments and suggestions of Reviewers 1, 2, and 3, the Discussion section was extensively re-organized and edited as follows:

o We removed the literature review sections on “Previous Research on Stoicism and Health” and “Theoretical Context” from the Discussion and added them to the Introduction.

o We added 2 long paragraphs on our theory of stoicism and constraints on health-related behaviors to the Discussion, under “Directions for Future Research.”

o Per suggestion of Reviewer 2, we added a section titled “Gender and Stoicism” to the Discussion.

VERSION 2 – REVIEW

REVIEWER	Katriina Whitaker University of Surrey, UK
REVIEW RETURNED	07-Jul-2017

GENERAL COMMENTS	Thank you for the opportunity to look at the revisions made by the authors on this manuscript. I agree that these revisions have substantially improved the paper. The restructure of the introduction, limitations section and overall clarity in the manuscript is excellent, and I would like to commend the authors on their work.
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REVIEWER	Kumi Hirokawa, PhD. Baika Women's University, Japan
REVIEW RETURNED	12-Jul-2017

GENERAL COMMENTS	<p>I think that the manuscript is significantly improved. I have several comments as outlined bellow. I hope the author will take them into consideration.</p> <p>Major concern This study reported validation of a stoicism ideology scale with conducting the confirmatory factor analysis. The authors also investigated the content validation, showing associations between the scores of stoicism ideology scale and a single item of “trying to be a stoic.” Additionally, the authors investigated gender and other demographic differences in scores of this stoicism ideology scale.</p> <p>In the Introduction section on page 5, the authors explained about “an explicit theory of stoicism” and that stoicism is a system for self-regulation rather than a behavior or personality trait. But I could not find any theoretical base. Please refer some previous studies to support the authors’ theoretical context.</p> <p>In the purpose and hypotheses, the authors should clearly explain how to validate the stoicism ideology scale. The authors investigated gender differences in the scores of the stoicism ideology scale. Is that because the authors hypothesized that the stoicism was related to characteristic of masculinity, which were more desirable for men? The authors should explain more about the hypotheses. Why should the authors investigate age and ethnic differences?</p> <p>I think that the authors so much focused on associations between the stoicism ideology and health related behaviors in the Introduction and Discussion (two paragraphs on page 10) sections; however, they did not investigate any health related behaviors in this study. Please focus on what the authors actually did in this study.</p> <p>Categorizing a continuous variable may result in lost information. Therefore, a t-test and an analysis of variance may be appropriate instead of logistic regression.</p> <p>Minor concern On page 5, the authors explained that “the 20-item Liverpool Stoicism Scale (LSS) (Table 1).” Those 20 items were not on Table 1. Which is “Table 1”?</p> <p>On page 6, the following sentence may be unnecessary: “The PW-SIS is a generalized scale which assessed stoic beliefs and health outcomes.”</p> <p>Why the authors categorized by under 25 years or 25 years and older? Are there specific reasons for this categorization?</p> <p>On page 11, the authors explained that “ our finding that a minority of women strongly endorsed stoic ideology,” but I did not find any related results in this study.</p>
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REVIEWER	Zhen Wang Mayo Clinic, USA
REVIEW RETURNED	23-Jul-2017

GENERAL COMMENTS	The authors have addressed all of my concerns. I have no more comments.
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REVIEWER	Silia Vitoratou Department of Biostatistics and Health Informatics, IoPPN, King's College, London
REVIEW RETURNED	17-Jul-2017

GENERAL COMMENTS	the authors fully addressed my concerns and removed from the analysis the parts that raised questions. I would still prefer to see fitted both the data-driven and theory driven models but it is up to the authors to decide to use only one of the methods. I recommend the manuscript to be published in its current version.
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VERSION 2 – AUTHOR RESPONSE

1. “In the Introduction section on page 5, the authors explained about ‘an explicit theory of stoicism’ [...] But I could not find any theoretical base. Please refer [to] some previous studies to support the authors’ theoretical context.”

□ Reviewer 2 is questioning the origin of our theory of stoicism in this comment, and asks for previous references. While the philosophical concept of stoicism did not originate with us (as reflected in citations 1-5), taken in full, we believe our sentences clearly convey that the theory is our own original theory, presented for the first time in this article. We have revised the relevant paragraph as follows:

In this report, we attempt to articulate an explicit theory of stoicism and its potential impact on health. We theorize that stoicism is a system for self-regulation rather than a behavior or personality trait. As a guide to ideal self-conduct, it requires self-conscious implementation and regular enforcement; in other words, stoicism is an ideology (e.g. a belief system which informs one’s attitudes and actions with the inherent potential for internal resistance and conflict). Personal ideologies create expectations for people about who they are, as well as how they should and should not behave. For example, we theorize that people who strongly endorse a personal ideology of stoicism may be more likely to avoid or delay seeking professional medical intervention for serious signs and symptoms of disease. This personal ideology of self will not mandate behavior in a deterministic fashion; rather, stoicism will create expectations of ideal behavior (which may not always be met). In order to test these theoretical propositions in future research, a validated measure of an individual’s endorsement of stoic ideologies is needed.

2. “The authors should explain more about the hypotheses” especially related to gender, age, and ethnicity.

We agree with Reviewer 2 that the purpose of these analyses was not stated explicitly in the Introduction. We have added a brief paragraph to address this concern:

In addition, in this report we conducted an exploratory assessment of the association between high endorsement of stoicism and participant age, gender, and race and ethnicity. We expect stoic ideologies to be embedded in larger system of cultural beliefs that may be related to age, gender, race and ethnicity, and other social characteristics.

3. “I think that the authors so much focused on associations between stoicism ideology and health related behaviors in the Introduction and Discussion (two paragraphs on page 10) sections; however they did not investigate any health related behaviors in this study. Please focus on what the authors actually did in this study.”

This comment is very similar to Reviewer 2’s comments on the original version of the paper. We have already substantially revised both the Introduction and Discussion to address this concern. The entire purpose of this research project was to develop a stoicism scale to be used in health-related empirical research. Therefore it is very important for us to discuss our theory of stoicism and the scale in the context of previous health-related research. We clarified in the Introduction that the PW-SIS scale itself does not measure health, rather it is a tool for health researchers:

(page 5) We present the results of confirmatory factor analysis of the multi-domain Pathak-Wieten Stoicism Ideology Scale (PW-SIS), and discuss the potential usefulness of this tool for predicting constraints in health-related help-seeking behaviors. The PW-SIS is a generalized scale which assesses stoic beliefs and sense of self but does not explicitly measure health behaviors or health outcomes.

We believe it is appropriate to include the discussion of health behavior theories on page 10, and how we think our theory fits in with other relevant theories in the literature.

4. “Categorizing a continuous variable may result in lost information. Therefore, a t-test and an analysis of variance may be appropriate instead of logistic regression.”

We prefer logistic regression because we are explicitly interested in strong endorsement of stoicism as an outcome in this analysis. We appreciate that Reviewer 2 might have taken a different analytical approach given different interests, but we used the correct approach for our stated goals.

5. “On page 5, the authors explained that ‘the 20-item Liverpool Stoicism Scale (LSS) (Table 1).’ Those 20 items were not on Table 1.”

□ We are very grateful to Reviewer 2 for noticing that this table was inadvertently omitted! We have included Table 1 with the 20-items of the LSS and corresponding domains of the PW-SIS. A brief sentence has also been added to the paragraph on the LSS. [NOTE TO EDITOR: This table was omitted during our own extensive internal revisions prior to submission to BMJ-Open. We apologize for the earlier omission.]

The LSS predominantly (16 of 20 items) assesses a single theoretical domain (stoic taciturnity) of the 4 validated theoretical domains included in the final PW-SIS scale.

6. “On page 6, the following sentence may be unnecessary: ‘The PW-SIS is a generalized scale ...’

□ This sentence was added in specific response to the critique by Reviewer 2 of the earlier version of our paper. We would prefer to keep it as it clarifies a point that other readers may also find confusing.

7. “Why the authors categorized by under 25 years or 25 years and older?”

□ As we explained in the paper, the majority of our respondents were aged 18 to 24 years old. The age distribution of our study participants did not support more than a dichotomous age category for the purpose of logistic regression analysis.

8. “On page 11, the authors explained that ‘our finding that a minority of women strongly endorsed stoic ideology,’ but I did not find any related results in this study.”

□ Here we used the word “minority” to mean fewer than 50%. These results are clear in Figure 3, which shows the distribution of results by quartile for women and for men. To further clarify these results, we added the following sentences to the paragraph describing the logistic regression results:

The top quartile of the distribution of all respondents (n=390) ranged from +0.33 to +1.67. Among women, 18.9% strongly endorsed stoicism, compared with 32.8% of men.

VERSION 3 – REVIEW

REVIEWER	Kumi Hirokawa, PhD. Baika Women's University, Japan
REVIEW RETURNED	08-Aug-2017

GENERAL COMMENTS	Thank you for your responses to my comments and revisions. I do not have any other questions except for Table 1. The authors detailed the 20-item Liverpool Stoicism Scale (LSS) designed by Wagstaff and Rowledge (1995) on Table 1. I am wondering whether it is possible to provide this LSS on Table 1 as it stands, because of copyright concerns. If the BMJ open is OK with Table 1, I have no objection to accepting this manuscript.
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VERSION 3 – AUTHOR RESPONSE

We have revised Table 1, added the correct reference to a table footnote, and emailed a reprint permission request to the University of Latvia, which holds the copyright for the Baltic Journal of Psychology.

A revised manuscript file is attached.

One unrelated issue:

Your online system will not permit me to correct one of my co-author's names. Please correct to "Christopher W. Wheldon"