Wister et al. (2013)

EPPI-Centre (2003) & Critical Appraisal Skills Programme (2018)

If the study has a broad focus and this data extraction focuses on just one component of the study, please specify this here

☒ Not applicable (whole study is focus of data extraction)

☐ Specific focus of this data extraction (please specify)

Study aim(s) and rationale

Was the study informed by, or linked to, an existing body of empirical and/or theoretical research?

Please write in authors' declaration if there is one. Elaborate if necessary, but indicate which aspects are reviewers' interpretation.

☒ Explicitly stated (please specify)

☐ Implicit (please specify)

☐ Not stated/unclear (please specify)

- stereotype threat
- menstruation/menstruation priming
- the degree to which menstruation is a barrier to education
- effects of menstruation on cognition
- impact of stereotype threat on cognitive performance.
- positive aspects of menstruation

Do authors report how the study was funded?

☐ Explicitly stated (please specify)

☐ Implicit (please specify)

☒ Not stated/unclear (please specify)

Study research question(s) and its policy or practice focus

What is/are the topic focus/foci of the study?

- The current research is expected broaden our understanding of stereotype threat, and more specifically, to add to the literature about how attitudes towards menstruation operate behaviourally in women's lives.

What is/are the population focus/foci of the study?

- menstruating women

What is the relevant age group?

☐ Not applicate (focus not learners)

☐ 0 - 4

☐ 5 - 10

☐ 11 - 16

☒ 17 - 20

☐ 21 and over

☐ Not stated/unclear

- young women

What is the sex of the population focus/foci?

☐ Not applicate (focus not learners)

☒ Female only

☐ Male only

☐ Mixed sex

☐ Not stated/unclear

What is/are the educational setting(s) of the study?

☐ Community centre

☐ Correctional institution

☐ Government department

☐ Higher education institution

☐ Home

☐ Independent school

☐ Local education authority

☐ Nursery school

☐ Other early years setting

☐ Post-compulsory education institution

☐ Primary school

☐ Residential school

☐ Secondary school

☐ Special needs school

☐ Workplace

☐ Other educational setting

In Which country or cuntries was the study carried out?

☒ Explicitly stated (please specify)

☐ Not stated/unclear (please specify)

- USA

Please describe in more detail the specific phenomena, factors, services, or interventions with which the study is concerned

What are the study reserach questions and/or hypotheses?

Research questions or hypotheses operationalise the aims of the study. Please write in authors' description if there is one. Elaborate if necessary, but indicate which aspects are reviewers' interpretation.

☒ Explicitly stated (please specify)

☐ Implicit (please specify)

☐ Not stated/unclear (please specify)

1. It was hypothesized, that participants in the Menstruation Threat conditions (Menstruation Threat/Positive Prime; Menstruation Threat/No Positive Prime), that is, those simply being asked about their own menstruation before completing cognitive tasks, would perform more poorly on both cognitive tasks than women in the No Menstruation Threat conditions (No Menstruation Threat/Positive Prime; No Menstruation Threat/No Positive Prime).

2. The Positive Prime would counteract the influence of the Menstruation Threat, such that participants in the Menstruation Threat/Positive Prime condition would perform no differently from the participants who did not receive a menstruation Threat. However, we considered the possibility that the Positive Prime, although intended to be positive, might activate stereotype threat simply because menstruation was mentioned.

3. Women who thought menstruation was bothersome and/or debilitating, and those who specifically endorsed the belief that menstruation negatively impacted their cognitive performance, would not do as well on either of the cogntiive tasks compared to women who did not hold these belifs. We expected women in the Menstruation Threat conditions, in which these negative beliefs had been primed, to perform least well on both cognitive tasks, compared to the women in the other conditions.

4. Women in the Menstruation Threat conditions would perform more poorly on both cognitive tasks than women in the No Menstruation Threat conditions, the closer they were to menstruating.

Methods - Design

Which variables or concepts, if any, does the study aim to measure or examine?

☒ Explicitly stated (please specify)

☐ Implicit (please specify)

☐ Not stated/unclear (please specify)

- menstruation threat
- positive priming
- cognitive task performance
- attitudes towards menstruation

Study timing

Please indicate all that apply and give further details where possible.

If the study examines one or more samples, but each at only one point in time it is cross-sectional.
If the study examines the same samples, but as they have changed over time, it is retrospective, provided that the interest is in starting at one timepoint and looking backwards over time.
If the study examines the same samples as they have changed over time and if data are collected forward over time, it is prospective provided that the interest is in starting at one timepoint and looking forward in time.

☒ Cross-sectional

☐ Retrospective

☐ Prospective

☐ Not stated/unclear (please specify)

If the study is an evaluation, when were measurements of the variable(s) used for outcome made, in relation to the intervention?

If at least one of the outcome variables is measured both before and after the intervention, please use the before and after category.

☐ Not applicable (not an evaluation)

☒ Before and after

☐ Only after

☐ Other (please specify)

☐ Not stated/unclear (please specify)

- depending on the condition one was in

Methods - Groups

If comparisons are being made between two or more groups, please specify the basis of any divisions made for making these comparisons.

Please give further details where possible.

☐ Not applicable (not more than one group)

☒ Prospecitive allocation into more than one group (e.g. allocation to different interventions, or allocation to intervention and control groups)

☐ No prospective allocation but use of pre-existing differences to create comparison groups (e.g. receiving different interventions, or characterised by different levels of a variable such as social class)

☐ Other (please specify)

☐ Not stated/unclear (please specify)

How do the groups differ?

☐ Not applicable (not more than one group)

☒ Explicityly stated (please specify)

☐ Implicit (please specify)

☐ Not stated/unclear (please specify)

- Menstruation Threat vs No Menstruation Threat
- Positive Prime vs No Positive Prime

Number of groups

For instance, in studies in which comparisons are made between groups, this may be the number of groups into which the dataset is divided for analysis (e.g. social class, or form size), or the number of groups allocated to, or receiving, an intervention.

☐ Not applicable (not more than one group)

☐ One

☐ Two

☐ Three

☒ Four or more (please specify)

☐ Other/unclear (please specify)

- Four (2 [Menstruation threat vs no threat] x 2 [Positive prime vs no prime])

Was the assignment of participants to interventions randomised?

☐ Not applicable (not more than one group)

☐ Not applicate (no prospective allocation)

☒ Random

☐ Quasi-random

☐ Non-random

☐ Not stated/unclear (please specify)

Where there was prospective allocation to more than one group, was the allocation sequence concealed from participants and those enrolling them until after enrolment?

Bias can be introduced, consciously or otherwise, if the allocation of pupils or classes or schools to a programme or intervention is made in the knowledge of key characteristics of those allocated. For example: children with more serious reading difficulty might be seen as in greater need and might be more likely to be allocated to the 'new' programme, or the opposite might happen. Either would introduce bias.

☐ Not applicable (not more than one group)

☐ Not applicable (no prospective allocation)

☒ Yes (please specify)

☐ No (please specify)

☐ Not stated/unclear (please specify)

Apart from the experimental intervention, did each study group receive the same level of care (that is, were they treated equally)?

☒ Yes
☐ No
☐ Can't tell

Study design summary

In addition to answering the questions in this section, describe the study design in your own words. You may want to draw upon and elaborate the answers you have already given.

Methods - Sampling strategy

Are the authors trying to produce findings that are representative of a given population?

Please write in authors' description. If authors do not specify please indicate reviewers' interpretation.

☒ Explicitly stated (please specify)

☐ Implicit (please specify)

☐ Not stated/unclear (please specify)

- female undergraduate students

Which methods does the study use to identify people or groups of people to sample from and what is the sampling frame?

e.g. telephone directory, electoral register, postcode, school listing, etc. There may be two stages – e.g. first sampling schools and then classes or pupils within them.

☐ Not applicable (please specify)
☒ Explicitly stated (please specify)
☐ Implicit (please specify)
☐ Not stated/unclear (please specify)

Which methods does the study use to select people or groups of people (from the sampling frame)?

e.g. selecting people at random, systematically - selecting for example every 5th person, purposively in order to reach a quota for a given characteristic.

☐ Not applicable (no sampling frame)
☐ Explicitly stated (please specify)
☐ Implicit (please specify)
☐ Not stated/unclear (please specify)

Planned sample size

If more than one group please give details for each group separately.

☐ Not applicable (please specify)
☐ Explicitly stated (please specify)
☐ Not stated/unclear (please specify)

Methods - Recruitment and consent

Which methods are used to recruit people into the study?

e.g. letters of invitation, telephone contact, face-to-face contact.

☐ Not applicable (please specify)

☐ Explicitly stated (please specify)
☐ Implicit (please specify)
☐ Not stated/unclear (please specify)

Were any incentives provided to recruit people into the study?

☐ Not applicable (please specify)
☐ Explicitly stated (please specify)
☒ Not stated/unclear (please specify)

Was consent sought?

Please comment on the quality of consent if relevant.

☐ Not applicable (please specify)
☐ Participant consent sought
☐ Parental consent sought
☐ Other consent sought
☐ Consent not sought
☒ Not stated/unclear (please specify)

Are there any other details relevant to recruitment and consent?

☐ No
☐ Yes (please specify)

Methods - Actual sample

What was the total number of participants in the study (the actual sample)?

If more than one group is being compared please give numbers for each group.

☐ Not applicable (e.g. study of policies, documents, etc)

☒ Explicitly stated (please specify)

☐ Implicit (please specify)

☐ Not stated/unclear (please specify)

- 92 undergraduate women from a small, urban, university in the Mid-Atlantic region.
- Menstruation Threat, Positive Prime: n = 22
- Menstruation Threat, No Positive Prime: n = 20
- No Menstruation Threat, Positive Prime: n = 17
- No Menstruation Threat, No Positive Primie: n = 18

What is the proportion of those selected for the study who actually participated in the study?

Please specify numbers and percentages if possible.

☐ Not applicable (e.g. study of policies, documents, etc)

☒ Explicitly stated (please specify)

☐ Implicit (please specify)

☐ Not stated/unclear (please specify)

- 75 participants provided the complete set of responses needed for analysis

Which country/countries are the individuals in the actual sample from?

If UK, please distinguish between England, Scotland, N. Ireland, and Wales if possible. If from different countries, please give numbers for each. If more than one group is being compared, please describe for each group.

☐ Not applicable (e.g. study of policies, documents, etc)

☐ Explicitly stated (please specify)

☒ Implicit (please specify)

☐ Not stated/unclear (please specify)

- population was primarily European American (87%)

What ages are covered by the actual sample?

Please give the numbers of the sample that fall within each of the given categories. If necessary, refer to a page number in the report (e.g. for a useful table). If more than one group is being compared, please describe for each group. If follow-up study, age at entry to the study.

☐ Not applicable (e.g. study of policies, documents, etc)

☐ 0 to 4

☐ 5 to 10

☐ 11 to 16

☒ 17 to 20

☒ 21 and over

☐ Not stated/unclear (please specify)

- Ranging from 18 to 29 years (M = 20.75, SD = 2.57)

What is the socio-economic status of the individuals within the actual sample?

If more than one group is being compared, please describe for each group.

☐ Not applicable (e.g. study of policies, documents, etc)
☐ Explicitly stated (please specify)
☐ Implicit (please specify)
☒ Not stated/unclear (please specify)

What is the ethnicity of the individuals within the actual sample?

If more than one group is being compared, please describe for each group.

☐ Not applicable (e.g. study of policies, documents, etc)

☒ Explicitly stated (please specify)

☒ Implicit (please specify)

☐ Not stated/unclear (please specify)

- 87% were European American

What is known about the special educational needs of individuals within the actual sample?

e.g. specific learning, physical, emotional, behavioural, intellectual difficulties.

☐ Not applicable (e.g. study of policies, documents, etc)
☐ Explicitly stated (please specify)
☐ Implicit (please specify)
☒ Not stated/unclear (please specify)

Is there any other useful information about the study participants?

☐ Not applicable (e.g. study of policies, documents, etc)

☒ Explicitly stated (please specify no/s.)

☐ Implicit (please specify)

☐ Not stated/unclear (please specify)

- Four participants were eliminated from the study who were 30 years old or older, in order to restrict the sample to a traditional undergraduate age range.
- Two participants whose number of days since the last day of their last menstrual period exceeded 40 days were also eliminated, since the normal range of menstrual cycle length in adults is 24 - 38 days
- Fifty percent of the participants reported taking oral contraceptives. Results from a Chi-Square analysis were not significant, indicating that these women were evenly distributed across all conditions.

- The results reported below are based on the data from the 75 participants who provided the complete set of responses needed for analysis.

How representative was the achieved sample (as recruited at the start of the study) in relation to the aims of the sampling frame?

Please specify basis for your decision.

☐ Not applicable (e.g. study of policies, documents, etc)

☐ Not applicable (no sampling frame)

☒ High (please specify)

☐ Medium (please specify)

☐ Low (please specify)

☐ Unclear (please specify)

- Exactly what they wanted

If the study involves studying samples prospectively over time, what proportion of the sample dropped out over the course of the study?

If the study involves more than one group, please give drop-out rates for each group separately. If necessary, refer to a page number in the report (e.g. for a useful table).

☐ Not applicable (e.g. study of policies, documents, etc)
☒ Not applicable (not following samples prospectively over time)
☐ Explicitly stated (please specify)
☐ Implicit (please specify)
☐ Not stated/unclear

For studies that involve following samples prospectively over time, do the authors provide any information on whether and/or how those who dropped out of the study differ from those who remained in the study?

☐ Not applicable (e.g. study of policies, documents, etc)
☒ Not applicable (not following samples prospectively over time)
☐ Not applicable (no drop outs)
☐ Yes (please specify)
☐ No

If the study involves following samples prospectively over time, do authors provide baseline values of key variables such as those being used as outcomes and relevant socio-demographic variables?

☐ Not applicable (e.g. study of policies, documents, etc)
☒ Not applicable (not following samples prospectively over time)
☐ Yes (please specify)
☐ No

Methods - Data collection

Please describe the main types of data collected and specify if they were used (a) to define the sample; (b) to measure aspects of the sample as findings of the study?

☐ Details

- Menstrual History -> a and b
- Positive Prime -> b
- cognitive task performance: Stroop and short SAT-like Math test -> b
- Menstrual Attitude Questionnaire (MAQ) -> b

Which methods were used to collect the data?

Please indicate all that apply and give further detail where possible.

☐ Curriculum-based assessment
☐ Focus group
☐ Group interview
☐ One to one interview (face to face or by phone)
☐ Observation
☒ Self-completion questionnaire
☐ Self-completion report or diary
☐ Exams
☐ Clinical test
☐ Practical test
☒ Psychological test
☐ Hypothetical scenario including vignettes
☐ School/college records (e.g. attendance records etc)
☐ Secondary data such as publicly available statistics
☐ Other documentation
☐ Not stated/unclear (please specify)

Details of data collection methods or tool(s).

Please provide details including names for all tools used to collect data and examples of any questions/items given. Also please state whether source is cited in the report.

☒ Explicitly stated (please specify)

☐ Implicit (please specify)

☐ Not stated/unclear (please specify)

- Attitudes toward Menstruation: Menstrual Attitude Questionnaire (MAQ) (Brooks-Gunn and Ruble 1980)
- Cognitive Tasks: Stroop test (Stroop, 1935) & short SAT-like Math test.

- Positive Prime: created by the researchers, see Appendix 1
- Menstruation History/Threat: 6-item survey developed by the researchers that asked participants to provide descriptive information about their own menstrual period, an estimation of how many days since the last day of the last period, and how many days until the first day of the next expected period, whether or not the participant was menstruating on the day of participation in the study and whether or not the participant was using any form of hormonal contraception. (see Appendix 1) -> also served as the Menstruation Threat.

Who collected the data?

Please indicate all that apply and give further detail where possible.

☒ Researcher
☐ Head teacher/Senior management
☐ Teaching or other staff
☐ Parents
☐ Pupils/students
☐ Governors
☐ LEA/Government officials
☐ Other education practitioner
☐ Other (please specify)
☐ Not stated/unclear

Do the authors describe any ways they addressed the reliability of their data collection tools/methods?

e.g. test-retest methods (Where more than one tool was employed please provide details for each.)

☐ Details

Do the authors describe any ways they have addressed the validity of their data collection tools/methods?

e.g. mention previous validation of tools, published version of tools, involvement of target population in development of tools. (Where more than one tool was employed please provide details for each.)

☐ Details

Was there concealment of study allocation or other key factors from those carrying out measurement of outcome – if relevant?

Not applicable – e.g. analysis of existing data, qualitative study. No – e.g. assessment of reading progress for dyslexic pupils done by teacher who provided intervention. Yes – e.g. researcher assessing pupil knowledge of drugs - unaware of pupil allocation.

☐ Not applicable (please say why)
☐ Yes (please specify)

☐ No (please specify)

Where were the data collected?

e.g. school, home.

☐ Explicitly stated (please specify)
☐ Implicit (please specify)
☒ Unclear/not stated (please specify)

Are there other important features of data collection?

e.g. use of video or audio tape; ethical issues such as confidentiality etc.

☐ Details

- Participants in the Menstruation Threat Conditions completed the Menstruation History before attempting the cognitive tasks.
- Participants in the No Threat conditions completed the Menstruation History after the cognitive tasks.
- Participants in the Positive Prime conditions initially received the paragraph noting positive aspects of menstruation
- Participants in the No Positive Prime conditions did not receive the positive prime.
- All subjects received the Menstrual Attitude Questionnaire subscales last.

Methods - Data analysis

Which methods were used to analyse the data?

Please give details e.g. for in-depth interviews, how were the data handled? Details of statistical analysis can be given next.

☐ Explicitly stated (please specify)
☐ Implicit (please specify)
☐ Not stated/unclear (please specify)

Which statistical methods, if any, were used in the analysis?

☐ Details

- 2 x 2 MANOVA was calculated examining the effects of Menstruation Threat (Threat vs no Threat) and Positive Prime (Positive Prime vs No positive Prime) on Stroop and mathematics performance.
- calculation of the overall mean scores on the MAQ sub scales and item MAQ 20
- Correlation analyses
- MANOVA was conducted to test for difference sin sub scale scores and responses to MAQ 20 across conditions

- r to z transformation

What rationale do the authors give for the methods of analysis for the study?

e.g. for their methods of sampling, data collection, or analysis.

☐ Details

For evaluation studies that use prospective allocation, please specify the basis on which data analysis was carried out.

'Intention to intervene' means that data were analysed on the basis of the original number of participants as recruited into the different groups. 'Intervention received' means data were analysed on the basis of the number of participants actually receiving the intervention.

☐ Not applicable (not an evaluation study with prospective allocation)
☐ 'Intention to intervene'
☐ 'Intervention received'
☐ Not stated/unclear (please specify)

Do the authors describe any ways they have addressed the reliability of data analysis?

e.g. using more than one researcher to analyse data, looking for negative cases.

☐ Details

Do the authors describe any ways they have addressed the validity of data analysis?

e.g. internal or external consistency; checking results with participants.

☐ Details

Do the authors describe strategies used in the analysis to control for bias from confounding variables?

☐ Details

Please describe any other important features of the analysis.

☐ Details

Please comment on any other analytic or statistical issues if relevant.

☐ Details

Results and Conclusions

How are the results of the study presented?

e.g. as quotations/figures within text, in tables, appendices.

☐ Details

- tables
- in text

What are the results of the study as reported by authors?

Please give details and refer to page numbers in the report(s) of the study where necessary (e.g. for key tables).

☐ Details

- 2 (Menstruation Threat vs No Threat) x 2 (Positive Prime vs No Prime) MANOVA on Stroop and mathematics performance only partially supported H1.
- A main effect was found for Menstruation Threat on Stroop performance.
- Participants in the Menstruation Threat conditions completed significantly fewer items correctly on the Stroop than participants in the No Menstruation Threat conditions.
- Participants in the No Menstruation/No Positive Prime condition had the best score while participants in the Menstruation Threat/Positive Prime condition had the worse scores.
- There was no effect of Menstruation Threat on math performance.
- There was no effect for Positive Prime, or for the Menstruation Threat/Positive Prime interaction on either Stroop or mathematics performance.
- Women were neutral (neither negative nor positive) in their assessment of menstruation as debilitating and bothersome.
- In addition, they were neutral in their belief that menstruation would impact how well they did on intellectual tasks
- Correlational analyses to test for any meaningful relationships between MAQ subscales and MAQ 20 and correct responses on the Stroop test or the mathematics test were conducted and revealed on significant results.
- Correlation among these variables were calculated for each cell and revealed only two significant relationships.
- In the Menstruation Threat/No Positive Prime condition, the more menstruation was viewed as Bothersome, the fewer correct Math responses.
- For participants in the No Threat/No Positive Prime condition, the more menstruation was viewed as Debilitating, the more correct responses on the Stroop.
- A MANOVA to test for differences in subscale scores and responses to MAQ 20 across condition, found a significant effect for Menstruation Threat

- Results did not support the prediction that women in Menstruation Threat conditions would endorse menstruation as more bothersome, debilitating and contributed to their diminished cognitive performance.
- Participants in the Menstruation Threat conditions viewed menstruation as *less* debilitating than those in the No Menstruation Threat conditions.
- Participants in the Menstruation Threat conditions viewed menstruation as *less* bothersome = than those in the No Menstruation Threat conditions.
- Participants in the Menstruation Threat conditions viewed menstruation having *less* impact on intellectual tasks than those in the No Menstruation Threat conditions.
- No significant effects were found for Positive Prime, or a Menstruation Threat/Positive Prime interaction.
- Correlations between the number of days since the last day of the last menstrual period and correct Stroop and Math responses for each condition, provide partial support for H4
- The correlation between the days since last menstruation and correct Stroop responses was significant for the Menstruation Threat/No Positive Prime condition, indicating that the closer participants were to their next period, the more *poorly* they performed on the Stroop test.
- The correlation between closeness to menstruation and Stroop responses, though not statistically significant, was reversed for the No Menstruation Threat/Positive prime condition, indicating that the closer these participants were to their next period, the *better* they performed on the Stroop.
- There were no significant correlations for the No Menstruation Threat/No Positive Prime condition, or the Menstruation Threat/Positive Prime condition.
- Comparison of the correlations between closeness to menstruation and correct Stroop responses for each condition with each other, revealed a significant difference between the Menstruation Threat/No Positive Prime and No Menstruation Threat/Positive Prime conditions.
- There were also significant differences between the correlations for the Menstruation Threat/No Positive Prime and Menstruation Threat/Positive Prime condition, and the No Menstruation Threat/No Positive Prime and No Menstruation Threat/Positive Prime.

Was the precision of the estimate of the intervention or treatment effect reported?

- CONSIDER:
  - Were confidence intervals (CIs) reported?

☐ Yes
☒ No
☐ Can't tell

Are there any obvious shortcomings in the reporting of the data?

☐ Yes (please specify)
☐ No

Do the authors report on all variables they aimed to study as specified in their aims/research questions?

This excludes variables just used to describe the sample.

☒ Yes (please specify)
☐ No

Do the authors state where the full original data are stored?

☐ Yes (please specify)
☒ No

What do the author(s) conclude about the findings of the study?

Please give details and refer to page numbers in the report of the study where necessary.

☐ Details

- The Menstruation History/Threat questions did not imply any negative stereotype about menstruation or its effects on cognition and as such was considered an implicit or subtle threat. The Positive Prime about menstruation offered to some participants was much more explicit in nature, implying that menstruation did not have a negative impact on cognition and instead was associated with enhanced creased and divergent thinking.

- The main effect of Menstruation Threat, such that women in the Menstruation Threat conditions scored lower on the Stroop than women not exposed to Menstruation Threat, indicates support for the hypothesis that when menstruation is brought to mind, it does serve as a threat that diminishes at least one area of cognition. The data also provide for support for our second hypothesis, in that women who were not exposed to either the Menstruation Threat or the Positive Prime scored highest on the Stroop. Women receiving the Positive Prime, but no Menstruation Threat, also had high scores, although slightly lower and not significantly different from the scores of the women in the highest scoring group.

- Finally, women presented with the Positive Prime and then exposed to Menstruation Threat had the least number of correct Stroop scores. Thus, the data suggest that the Positive Prime used in this study did not counteract the effect of Menstruation Threat but served rather to intensify it. These findings appear to be robust, considering that women in the Menstruation Threat conditions believed that menstruation was less debilitating, less bothersome and specifically, would have less impact on how well they

would do on intellectual tasks compared to women in the No Menstruation Threat conditions who held more negative attitudes. It is reasonable to expect that women in the Menstruation Threat conditions might think menstruation would be more debilitating, more bothersome and more likely to impact performance on intellectual tasks, but this was not the case. In spite of reporting more positive attitudes, these women did more poorly on the Stroop.

- We expected that women in the Menstruation Threat conditions would perform more poorly the closer they were to menstruation, while women receiving the Positive Prime only, and no Menstruation Threat, would perform better the closer they were to menstruation, and this pattern did emerge in the examination of the correlations pertaining to Stroop performance.
- However, women in the Menstruation Threat/No Positive Prime condition performed more poorly on the Stroop the closer they were to menstruation, (as measured, the further away from the last day of their last menstrual cycle). Women in the No Menstruation Threat/Positive Prime condition performed better on the Stroop the closer they were to menstruating. These findings provide some evidence of positive priming as a moderator of the relationship between closeness to menstruation and enhanced performance.
- While these findings provide some support for the hypothesis that menstruation serves as a threat that diminishes cognitive performance, it would be premature to assume that the menstruation threat has a negative impact on women's cognition broadly considered, since only two cognitive tests were used, and there were no effects of menstruation threat on women's performance of the math test.
- It is not clear why there were no effects of menstruation threat on the math test. As mentioned earlier, previous research suggests that test difficulty and domain identification are important moderating variables in studies of the impact of stereotype threat on test taking. n this study, neither the level of challenge of the math test, nor the degree of math identification was assessed, although it can be assumed that the math test was moderately challenging (e.g., designed to mimic an SAT test) and therefore not easy or advanced.
- The most important finding from this study is that menstruation threat can be elicited by asking women to answer some descriptive questions about their own menstrual cycles and diminishes performance in at least one area of cognition. Second, the study provides evidence that positive priming, absent calling attention to one's own menstruation, moderates the relationship between closeness to menstruation and performance on the Stroop.

Quality of the study - Reporting

Is the context of the study adequately described?

Consider your answer to questions: Why was this study done at this point in time, in those contexts and with those people or institutions? (Section B question 2) Was the study informed by or linked to an existing body of empirical and/or theoretical research? (Section

B question 3) Which of the following groups were consulted in working out the aims to be addressed in the study? (Section B question 4) Do the authors report how the study was funded? (Section B question 5) When was the study carried out? (Section B question 6)

☒ Yes (please specify)
☐ No (please specify)

Are the aims of the study clearly reported?

Consider your answer to questions: What are the broad aims of the study? (Section B question 1) What are the study research questions and/or hypotheses? (Section C question 10)

☒ Yes (please specify)
☐ No (please specify)

Is there an adequate description of the sample used in the study and how the sample was identified and recruited?

Consider your answer to all questions in Methods on 'Sampling Strategy', 'Recruitment and Consent', and 'Actual Sample'.

☒ Yes (please specify)
☐ No (please specify)

Is there an adequate description of the methods used in the study to collect data?

Consider your answer to the following questions in Section I: Which methods were used to collect the data? Details of data collection methods or tools Who collected the data? Do the authors describe the setting where the data were collected? Are there other important features of the data collection procedures?

☒ Yes (please specify)
☐ No (please specify)

Is there an adequate description of the methods of data analysis?

Consider your answer to the following questions in Section J: Which methods were used to analyse the data? What statistical methods, if any, were used in the analysis? Who carried out the data analysis?

☒ Yes (please specify)
☐ No (please specify)

Is the study replicable from this report?

☒ Yes (please specify)
☐ No (please specify)

Do the authors avoid selective reporting bias?

(e.g. do they report on all variables they aimed to study as specified in their aims/research questions?)

☒ Yes (please specify)
☐ No (please specify)

Quality of the study - Methods and data

Are there ethical concerns about the way the study was done?

Consider consent, funding, privacy, etc.

☒ Yes, some concerns (please specify)

☐ No concerns

- no consent or funding mentioned

Were students and/or parents appropriately involved in the design or conduct of the study?

☒ Yes, a lot (please specify)
☐ Yes, a little (please specify)
☐ No (please specify)

Is there sufficient justification for why the study was done the way it was?

☒ Yes (please specify)
☐ No (please specify)

Was the choice of research design appropriate for addressing the research question(s) posed?

☒ Yes (please specify)

☒ No (please specify)

- could be better. No manipulation check and only an implicit threat

To what extent are the research design and methods employed able to rule out any other sources of error/bias which would lead to alternative explanations for the findings of the study?

e.g. (1) In an evaluation, was the process by which participants were allocated to or otherwise received the factor being evaluated concealed and not predictable in advance? If not, were sufficient substitute procedures employed with adequate rigour to rule out any alternative explanations of the findings which arise as a result? e.g. (2) Was the attrition rate low and if applicable similar between different groups?

☐ A lot (please specify)
☒ A little (please specify)

☐ Not at all (please specify)

How generalisable are the study results?

☐ Details

- towards undergraduate females

Weight of evidence - A: Taking account of all quality assessment issues, can the study findings be trusted in answering the study question(s)?

In some studies it is difficult to distinguish between the findings of the study and the conclusions. In those cases please code the trustworthiness of this combined results/conclusion. ***Please remember to complete the weight of evidence questions B-D which are in your review specific data extraction guidelines.***

☐ High trustworthiness (please specify)
☒ Medium trustworthiness (please specify)
☐ Low trustworthiness (please specify)

Have sufficient attempts been made to justify the conclusions drawn from the findings so that the conclusions are trustworthy?

☐ Not applicable (results and conclusions inseparable)
☐ High trustworthiness
☒ Medium trustworthiness
☐ Low trustworthiness

Wells et al. (2014)

CASE CONTROL STUDIES

Note: A study can be awarded a maximum of one star for each numbered item within the Selection and Exposure categories. A maximum of two stars can be given for Comparability.

Selection

Is the case definition adequate?

- a) yes, with independent validation
- b) yes, e.g., record linkage or based on self reports
- c) no description

Representativeness of the cases

- a) consecutive or obviously representative series of cases *
- b) potential for selection biases or not stated

Selection of Controls

- a) community controls *
- b) hospital controls
- c) no description

Definition of Controls

- a) no history of disease (endpoint) *
- b) no description of source

Comparability

Comparability of cases and controls on the basis of the design or analysis

- a) study controls for _____ (Select the most important factor.) *
- b) study controls for any additional factor * (This criterion could be modified to indicate specific control for a second important factor.)

Exposure

Ascertainment of exposure

- a) secure record (e.g., surgical records) *
- b) structured interview where blind to case/control status *
- c) interview not blinded to case/control status
- d) written self report or medical record only
- e) no description

Same method of ascertainment for cases and controls

- a) yes *
- b) no

Non-Response rate

- a) same rate for both groups *
- b) non respondents described
- c) rate different and no designation

COHORT STUDIES

Note: A study can be awarded a maximum of one star for each numbered item within the Selection and Outcome categories. A maximum of two stars can be given for Comparability.

Selection

Representativeness of the exposed cohort

- a) truly representative of the average _____ (describe) in the community *
- b) somewhat representative of the average _____ in the community *
- c) selected group of users, e.g., nurses, volunteers
- d) no description of the derivation of the cohort

Selection of the non exposed cohort

- a) drawn from the same community as the exposed cohort *
- b) drawn from a different source
- c) no description of the derivation of the non exposed cohort

Ascertainment of exposure

- a) secure record (e.g., surgical records) *
- b) structured interview *
- c) written self report
- d) no description

Demonstration that outcome of interest was not present at start of study

- a) yes *
- b) no

Comparability

Comparability of cohorts on the basis of the design or analysis

- a) study controls for _____ (select the most important factor) *
- b) study controls for any additional factor * (This criterion could be modified to indicate specific control for a second important factor.)

Outcome

Assessment of outcome

- a) independent blind assessment *
- b) record linkage *
- c) self report
- d) no description

Was follow-up long enough for outcomes to occur

- a) yes (select an adequate follow up period for outcome of interest) *
- b) no

Adequacy of follow up of cohorts

- a) complete follow up - all subjects accounted for *
- b) subjects lost to follow up unlikely to introduce bias - small number lost - > _____ % (select an adequate %) follow up, or description provided of those lost) *
- c) follow up rate < _____% (select an adequate %) and no description of those lost
- d) no statement

University of Glasgow (n.d.)

DOES THIS REVIEW ADDRESS A CLEAR QUESTION?

Did the review address a clearly focussed issue?

- Was there enough information on:
  - The population studied
  - The intervention given
  - The outcomes considered

☐ Yes
☐ Can't tell
☐ No

Did the authors look for the appropriate sort of papers?

- The 'best sort of studies' would:
  - Address the review's question
  - Have an appropriate study design

☐ Yes
☐ Can't tell
☐ No

ARE THE RESULTS OF THIS REVIEW VALID?

Do you think the important, relevant studies were included?

- Look for:
  - Which bibliographic databases were used
  - Follow up from reference lists
  - Personal contact with experts
  - Search for unpublished as well as published studies
  - Search for non-English language studies

☐ Yes
☐ Can't tell
☐ No

Did the review's authors do enough to assess the quality of the included studies?

- The authors need to consider the rigour of the studies they have identified. Lack of rigour may affect the studies results.

☐ Yes

☐ Can't tell
☐ No

If the results of the review have been combined, was it reasonable to do so?

- Consider whether:
  - The results were similar from study to study
  - The results of all the included studies are clearly displayed
  - The results of the different studies are similar
  - The reasons for any variations are discussed

☐ Yes
☐ Can't tell
☐ No

WHAT ARE THE RESULTS?

What is the overall result of the review?

- Consider:
  - If you are clear about the review's 'bottom line' results
  - What these are (numerically if appropriate)
  - How were the results expressed (NNT, odds ratio, etc)

How precise are the results?

- Are the results presented with confidence intervals?

☐ Yes
☐ Can't tell
☐ No

WILL THE RESULTS HELP LOCALLY?

Can the results be applied to the local population?

- Consider whether:
  - The patients covered by the review could be sufficiently different from your population to cause concern
  - Your local setting is likely to differ much from that of the review

☐ Yes
☐ Can't tell
☐ No

Were all important outcomes considered?

☐ Yes
☐ Can't tell
☐ No

Are the benefits worth the harms and costs?

- Even if this is not addressed by the review, what do you think?

☐ Yes
☐ Can't tell
☐ No

References

Critical Appraisal Skills Programme. (2018). CASP Systematic Review Checklist [Organization]. In *CASP - Critical Appraisal Skills Programme*. https://casp-uk.net/casp-tools-checklists/.

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