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Potentially coercive self-citation by peer reviewers: A cross-sectional study

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ABSTRACT

Objective: Peer reviewers sometimes request that authors cite their work, either appropriately or via coercive self-citation to highlight the reviewers' work. The objective of this study was to determine in peer reviews submitted to one biomedical journal (1) the extent of peer reviewer self-citation; (2) the proportion of reviews recommending revision or acceptance versus rejection that included reviewer self-citations; and (3) the proportion of reviewer self-citations versus citations to others that included a rationale.
Methods: Peer reviews for manuscripts submitted in 2012 to the *Journal of Psychosomatic Research* were evaluated. Data extraction was performed independently by two investigators.
Results: There were 616 peer reviews (526 reviewers; 276 manuscripts), of which 444 recommended revision or acceptance and 172 rejection. Of 428 total citations, there were 122 peer reviewer self-citations (29%) and 306 citations to others' work (71%). Self-citations were more common in reviews recommending revision or acceptance (105 of 316 citations; 33%) versus rejection (17/112; 15%; $p < 0.001$). The percentage of self-citations with no rationale (26 of 122; 21%) was higher than for citations to others' work (15 of 306; 5%; $p < 0.001$).
Conclusions: Self-citation in peer reviews is common and may reflect a combination of appropriate citation to research that should be cited in published articles and inappropriate citation intended to highlight the work of the peer reviewer. Providing instructions to peer reviewers about self-citation and asking them to indicate when and why they have self-cited may help to limit self-citation to appropriate, constructive recommendations.

Introduction

Medical journals rely on the input of outside peer reviewers to evaluate submitted manuscripts. Since peer review was introduced over 200 years ago, it has been viewed as an important quality control mechanism for scientific publication and a core component of the scientific process itself [1]. Clinicians give more credence to results published in peer-reviewed journals [2], and peer review is seen as an important indicator of scientific reputability [3]. Peer review, however, has been criticized for its inconsistency, for sometimes supporting narrow consensus and bias, and because it can be subjective and easily abused [4–6].

The impact of academic research is commonly quantified via citation metrics [7,8], and it is well-documented that some researchers attempt to inflate their own citation counts through unnecessary self-citation to their own work in their publications [9,10]. Similarly, the practice of "coercive self-citation" by editors of academic journals has been described [11–15], by which editors make requests to authors during the article review process to add citations from the editor's own journal without any rationale provided. That is, the editor gives no indication that the manuscript is lacking in attribution or contains important inaccuracies

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or specific gaps, which will be addressed via a discussion of a recommended citation [11].

Peer reviewers may also practice coercive self-citation during the article review process by requesting that authors cite the reviewers' own publications unnecessarily [7,16]. Similar to coercive citation by editors, this would involve recommendations for citation to the reviewer's own work that does not address failures to properly attribute, information gaps, or inaccuracies in the manuscript. The Committee on Publication Ethics (COPE) Ethical Guidelines for Peer Reviewers specifies that recommendations by a peer reviewer to cite his/her own work should be made only as necessary to substantively improve scientific publication and that peer reviewers should "not suggest that authors include citations to the reviewer's (or their associates') work merely to increase the reviewer's (or their associates') citation count or to enhance the visibility of their or their associates' work" [17]. In one study [18], however, 23% of US government researchers indicated in an anonymous survey that at some point a reviewer had requested that they include what they believed to be unnecessary references to his/her own publication(s) in a manuscript. No studies have examined actual peer reviews to determine how often potentially coercive peer reviewer self-citation occurs in the article review process.

The objective of this study was to examine peer reviews submitted to one journal over the course of a year and to assess whether there may be potentially coercive peer reviewer self-citation. We hypothesized that (1) a substantial number of peer reviews would include citations to the reviewer's work; (2) that if coercive peer reviews were present, then peer reviewers would include a greater proportion of self-citations in reviews where they recommended revision or acceptance compared to reviews where they recommended rejection; and (3) that a smaller proportion of peer reviewer self-citations would include a rationale that addressed attribution failures, specific information gaps, or inaccuracies in the manuscript compared to citations of the work of others.

Methods

Selection of peer reviews

The peer reviews that were evaluated were from manuscripts submitted to the *Journal of Psychosomatic Research* from January 1, 2012 to December 31, 2012. The journal is a multidisciplinary research journal that publishes a range of types of articles that focus on the relationship between psychology, medical illness and health care. The 2012 impact factor was 3.3. No specific instructions are provided by the journal to peer reviewers with respect to self-citation.

The authors of this study included the two editors and two associate editors of the journal, who were able to access the peer reviews with the support of the journal publisher, Elsevier. Ethical approval to conduct the study was obtained by the Research Ethics Committee of the Jewish General Hospital in Montreal, Canada.

All peer reviews, with the exception of reviews of manuscripts authored or co-authored by the investigators of the present study, were downloaded into an Excel spreadsheet. The reviews of the current investigators' manuscripts were excluded to protect reviewer confidentiality, because the journal's peer review process is blind to authors. In addition, reviews done by the present study co-authors were excluded due to the conflict of interest in rating whether self-citations by peer reviewers included a rationale.

Only peer reviews of *full-length articles*, *reviews*, and *short reports* were considered, because other publication types, including *letters-to-the-editor*, *commentaries*, and *editorials*, are not typically peer reviewed. We did not include editorial comments from articles that were pre-reviewed, but not sent out for peer review. We evaluated only reviews of the initially submitted version of manuscripts, but not reviews of revised manuscripts. This is because reviewers' coercive self-citation via the peer review process would most likely occur during initial review and not subsequently, when the purpose of the review is to determine if the authors have adequately addressed comments previously made by the reviewers. Two investigators independently evaluated all reviews for inclusion with any discrepancies resolved by consensus.

Data extraction

For each included peer review, we extracted the manuscript number, manuscript author, manuscript title, total number of reviews, number of reviews recommending acceptance or revision, identify of the peer reviewer, peer reviewer recommendation, final journal disposition (accept or reject), and the text of the actual review. From the text of the review, we extracted the total number of specific and general citations in the review and the number of these citations where the peer reviewer was an author or co-author. Specific citations were defined as citations with enough information to search and locate a specific publication (see Appendix 1 for example). To determine if a reviewer was an author or co-author of a specific citation, we used multiple electronic databases to locate the cited publication, and then reviewed the publication to determine if the peer reviewer had been an author. General citations were defined as broad references to the work of an author or group of authors without specifying a specific article to cite (see Appendix 1 for example). For each general citation, we identified the investigator or team whose work was being referenced then cross-cited to determine if the peer reviewer was an author or co-author of any publications that were part of the generally cited research. For general and specific citations, we documented whether citations could be linked to the reviewer through the citation in the review because the peer reviewer's name was listed or if a background search was required to ascertain the link. The latter could occur, for instance, when only the first author was listed, and the peer reviewer was a co-author.

We additionally coded whether a rationale was provided for each citation in the review. Citations were coded as having a rationale if the reviewer made any indication that the citation was included to address (1) a failure to properly attribute material presented in the manuscript, (2) specific information relevant to the topic, but missing from the manuscript, or (3) specific inaccuracies in the information presented in the manuscript. For each self-citation by peer reviewers, if the manuscript under review was ultimately published in the journal, we determined whether or not the recommended citation appeared in the published article. Two investigators independently extracted data with discrepancies resolved by consensus. The coding manual is available in Appendix 1. Examples of citations that would be coded as citations with and without a rationale are shown in Appendix 2.

Statistical analysis

We used the chi-square test to compare the proportion of total citations that were self-citations in reviews recommending revision or acceptance versus reviews recommending rejection and to compare the proportion of self-citations that included a rationale compared to citations to the works of others that included a rationale. All analyses were conducted using SPSS version 22.0 (Chicago, IL), and all statistical tests were conducted with a $p < .05$ significance level.

Results

There were 305 manuscripts submitted to the journal in 2012 that were sent for peer review, not including 50 that were rejected without peer review. These 305 manuscripts were associated with 656 peer reviews. There were 5 manuscripts submitted by investigators of the present study with 11 peer reviews, which were excluded, leaving 300 manuscripts and 645 peer reviews. Of these, 29 peer reviews were excluded because the

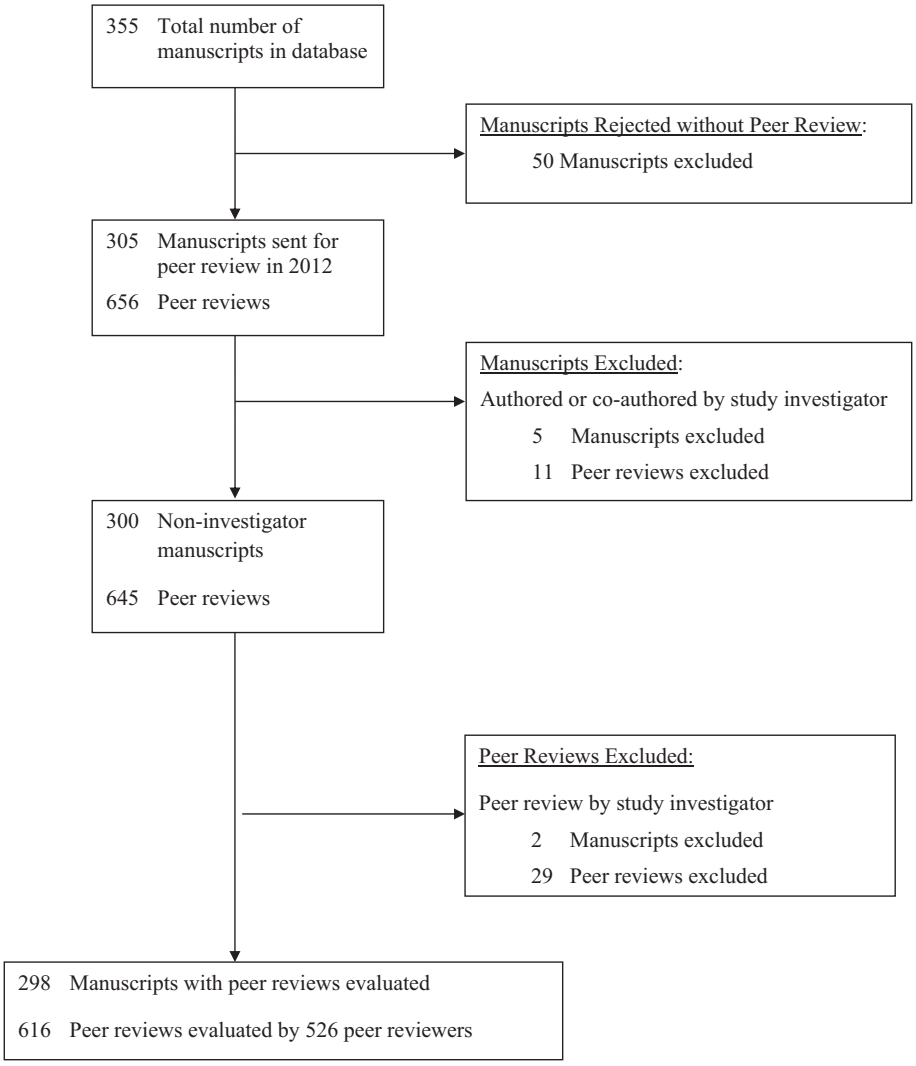

Fig. 1. Flow diagram of selection of peer reviews for evaluation.

reviewer was an investigator in the present study. For 2 manuscripts, this resulted in exclusion of the manuscript. Thus, a total of 616 peer reviews by 526 reviewers from 298 submitted manuscripts were included (see Fig. 1). Of these, 444 recommended revision or acceptance, and 172 recommended rejection. One peer review, which had 11 self-citations, none with a rationale, was identified by the editors and not forwarded to the authors as part of the article review process.

In the 616 included peer reviews, 171 (28%) included at least one citation to the reviewer's work or the work of others. There were a total of 428 citations, including 376 specific citations (88%) and 52 general citations (12%). As shown in Table 1, of the 428 citations, 122 (29%) were citations to a peer reviewer's own work, and 306 (71%) were citations to the work of others.

The mean number of total citations per review was similar in reviews that recommended revision or acceptance (0.71) and reviews that recommended rejection (0.65). However, the percentage of citations that were self-citations was statistically significantly higher in reviews that recommended revision or acceptance (33%) versus rejection (15%, $p < 0.001$). The percentage for reviews that recommended revision or acceptance dropped to 31% if the one review with 11 self-citations, which was not forwarded to authors, is excluded, but the difference was still statistically significant ($p = 0.001$).

Of the 428 total citations, reviewers failed to provide any rationale for 41 (10%). The percentage of self-citations without any rationale (21%) was significantly higher than the percentage of citations to others' work that did not include a rationale (5%; $p < 0.001$). When the review with 11 self-citations was excluded, the percentage of self-citations with no rationale dropped to 14%, but the difference was still statistically significant ($p = 0.003$).

The 122 self-citations were from 76 reviews (12% of 616 total peer reviews; 44% of 171 reviews with any citations), including 64 of 444 reviews (14%) that recommended revision or acceptance and 12 of 172 (7%) that recommended rejection. Of the 298 manuscripts that underwent peer review and were included, at least one review of 65 manuscripts (22%) included a peer reviewer self-citation.

Among the 154 manuscripts for which revisions were completed and which were eventually accepted for publication, there were 38 (25%) that included reviews with at least one peer reviewer self-citation that was forwarded to authors for consideration in revising the manuscript. Of 60 reviewer self-citations in reviews of these manuscripts, 42 (70%) were included in the final publication. Of the 154 manuscripts that were revised and eventually accepted for publication, 3 (2%) included reviews forwarded to authors with self-citations without any rationale. The 4 self-citations without a rationale in these 3 reviews were all included in the final publication.

Discussion

This study examined peer reviews submitted to the *Journal of Psychosomatic Research* in 2012 to determine the frequency of reviewer self-citation and whether there were patterns of self-citation versus other citation in the reviews that are suggestive of potential coercive citation by peer reviewers. Of all citations included in the reviews, 29% were self-citations, and the percentage was statistically significantly higher among reviews recommending revision or acceptance (33%) compared to reviews that recommended rejection (15%). We found

Table 1
Self- and other-citations by peer reviewer recommendation and presence or absence of rationale

Number of self-citations in peer review	Number of peer reviews	Number self-citations/number total citations (%)	Number self-citations without rationale/number self-citations (%)	Number other citations without rationale/number other citations (%)
Reviews with recommendation to revise or accept				
0	380	0/114 (0%)	–	3/114 (3%)
1	46	46/118 (39%)	5/46 (11%)	4/72 (6%)
2	11	22/36 (61%)	2/22 (9%)	0/14 (0%)
3	2	6/9 (67%)	3/6 (50%)	0/3 (0%)
4	2	8/11 (73%)	2/8 (25%)	2/3 (67%)
5	0	–	–	–
6	2	12/17 (71%)	0/12 (0%)	0/5 (0%)
11	1	11/11 (100%)	11/11 (100%)	–
Sub-totals	444	105/316 (33%)	23/105 (22%)	9/211 (4%)
Reviews with recommendation to reject				
0	160	0/68 (0%)	–	3/68 (4%)
1	10	10/30 (33%)	1/10 (10%)	2/20 (10%)
2	1	2/3 (67%)	2/2 (100%)	1/1 (100%)
3	0	–	–	–
4	0	–	–	–
5	1	5/11 (45%)	0/5 (0%)	0/6 (0%)
6	0	–	–	–
11	0	–	–	–
Sub-totals	172	17/112 (15%)	3/17 (18%)	6/95 (6%)
Totals	616	122/428 (29%)	26/122 (21%)	15/306 (5%)

that 12% of all peer reviews included a citation to the reviewer's work, including 14% of reviews that recommended revision or acceptance and 7% of reviews that recommended rejection. Citations to a reviewer's own work were significantly more likely to be included without any rationale (21%) compared to citations of work by others (5%). Among reviews of manuscripts that underwent revision and were eventually published, 25% of reviews forwarded to authors included a citation to a reviewer's own work, although only 3% included a citation to a reviewer's work without any rationale.

Thus, the percentage of reviews with reviewer self-citations, but without any rationale, which were included in the revision process of manuscripts eventually published was low. On the other hand, 1 of every 4 manuscripts that were revised for publication did include a reviewer self-citation. All self-citations with any explanation at all were coded as having a rationale, so we were not able to determine the degree to which these citations represented important, necessary additions to improve the quality of manuscripts versus attempts at coercive self-citation by reviewers. However, reviewer self-citations were more than 2 times as likely to be made in reviews recommending revision or acceptance versus rejection, even though the overall citation rate was similar in reviews with different publication recommendations. Furthermore, reviewer self-citations were more than 4 times as likely to be made without any rationale compared to citations to the work of others.

Peer reviewers are typically selected on the basis of their expertise on the topic of a manuscript that has been submitted for review. Thus, in many cases, recommendations by reviewers to cite their own work reflects the reviewer's expertise and are based on substantive and appropriate concerns about the manuscript content. These patterns, however, suggest that there are differences in how self-citation and citation of the work of others are used in peer review and that some self-citations, even when a rationale is provided, are likely not necessary revisions that improve the quality of the manuscript substantively.

We counted any explanation for a citation, no matter how brief or apparently superfluous, as a rationale, because the ability to actually evaluate the appropriateness of rationales for citation requires specific content expertise related to the topic of the manuscript, which we did not have for all manuscripts, and which editors typically rely upon peer reviewers to provide. This was a limitation of our study. Another limitation is that the study included peer reviews from only one journal, and it is not clear to what degree the results would generalize to other journals. On the other hand, problematic peer reviewer self-citation has been reported anecdotally in other publications [7,16,19].

Self-citation via peer review with the goal of increasing one's own citation count unfairly distorts citation metrics. It also conflicts with the role of a peer reviewer, which is to assist the editor to determine the merit of a manuscript and to assist authors to improve their work [19]. If a self-citation is not detected and removed from the reviewer's comments by an editor, it puts authors in the difficult position of having to decide whether to alter their manuscript in order to comply with a request for a potentially superfluous citation, or to argue against incorporating a reviewer recommendation, which may raise concerns that their manuscript will not be published [16].

Ideally, in the context of anonymous peer review, editors will recognize and remove unnecessary self-citations from peer reviews before forwarding to authors. However, it may not always be obvious when self-citation by peer reviewers occurs. The names of senior authors, for instance, may appear at the end of author lists and may not be included in a citation request that refers to the citation by the name of the first author. Similarly, the degree to which a reviewer citation recommendation represents a substantive and necessary addition to a manuscript may not be readily discernable to an editor without expertise on a manuscript topic [16].

Open peer review, in which reviewers' names are provided to authors of submitted manuscripts, could discourage peer reviewer self-citation, and in cases where it occurs would make it easier for authors to point out abuses to editors. However, there are other advantages and disadvantages to consider in using open peer review, and it is not commonly employed [20].

For journals that use peer review that is blinded to authors, as does the *Journal of Psychosomatic Research*, an option would be to include a statement consistent with COPE guidelines in instructions for peer reviewers, such as, "If you recommend citations to other publications in your review, please provide rationales for including those citations. Furthermore, consistent with COPE Ethical Guidelines for Peer Reviewers, we discourage reviewers from recommending citation of their own work when this is not clearly necessary to improve the quality of the manuscript under review. Please state specifically in your Comments to the Editor if you have recommended citation of your own work and the reason for this recommendation." Editors should give consideration

to testing whether providing these instructions or even incorporating non-blinded reviews would reduce the number of potentially coercive citations requested by peer reviewers.

Conflicts of interest

All authors have completed the Unified Competing Interest form at http://www.icmje.org/coi_disclosure.pdf and declare that no authors have any conflict of interest disclosures for the past 3-year reporting period.

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Appendix 1. Coding manual — external peer reviews

Note: Each spreadsheet row is a review of a manuscript. Manuscript information (Number, Type of Article, Title, First Author and Total Number of Reviews, Number of Reviews recommending acceptance) may repeat across rows should there be multiple reviews for the same manuscript.

Review ID: Unique study review ID.

Manuscript number: Journal-assigned manuscript number (in 3 columns for sorting).

Inclusion criteria:

No: The article is not an original contribution subject to peer review. Only reviews for the following categories of submissions will be included: Full Length Article, Short Report, Other Paper, Review Article. Reviews for submissions that do not typically receive external peer review (Editorial, Commentary, Letter-to-the-Editor, Book Review).

No: The article was rejected without full peer review. Reviews that reflect only pre-review decisions by the editors on whether or not to send for review or reject without peer review will not be considered.

No: The article was authored by a journal editor. For all manuscripts authored or co-authored by a journal editor or associate editor, reviewer names were removed to protect the anonymity of peer reviewers.

No: Review by study investigator. All reviews conducted by the investigators of the present study are excluded from consideration due to the conflict of interest involved in rating whether rationales were provided for self-citations, if any.

Yes: Include.

Type of article: Provided by journal.

Manuscript title: Provided by journal.

Manuscript first author last name: Provided by journal.

Manuscript first author first name: Provided by journal.

Total number of reviews: Enter the number of reviews submitted for the manuscript.

Number of reviews recommending revision/acceptance: Enter the number of reviews that recommended acceptance or revision.

Our study review #: Review number out of total number of reviews *per manuscript* that recommended acceptance or revision and were included in our study (e.g. if there are 3 reviews of the manuscript that are included, our study review numbers will be 1, 2, 3.) The count will start over for the next manuscript.

Reviewer recommendation: Provided by journal.

Reviewer comments to author: Provided by journal.

Reviewer comments to editor: Provided by journal.

Reviewer last name: Provided by journal.

Reviewer first name: Provided by journal.

Final decision: Provided by journal.

1.1. Reviewer and citation information

Our study reviewer number: Enter the unique reviewer number assigned to the reviewer. Refer to the Reviewer tab for the numbers assigned to each reviewer.

Total number of general and specific citations in review: This will be calculated by summing the total number of general and specific citations in review. General citations refer to the work of an author or group without citing a specific publication. Specific citations refer to a specified publication.

Number of general citations in review: A *general citation* is defined as a broad reference to work of an author or authors, e.g. *work by Thombs and colleagues recommends against depression screening*. Enter the total number of citations of this sort.

Number of general citations — author or co-author: Enter the number of general citations authored or co-authored by the reviewer. For this, in addition to noting a general citation of one's own work, check co-authorship between reviewer and general citation to determine if the general work includes work by reviewer.

Number of specific citations in review: A *specific citation* is defined as a citation that includes enough information to allow for searching and locating an article. E.g. *arguments against depression screening have been put forward (Thombs et al., JPR, 2010)*.

Number of specific citations — author or co-author: Enter the number of specific citations authored or co-authored by the reviewer. For this, the specific article cited must be found and all the authors of the article must be checked. Senior investigators often appear as last authors on published papers.

Total number of self-citations: This will be calculated as the sum of general and specific self-citations.

Number of self-citations where reviewer name appears in review citation: Enter the number, of the total, where the reviewer's name appears in the review citation.

Number of self-citations where reviewer name does not appear in review citation: Enter the number, of the total, where the reviewer's name does not appear in the review citation.

Number of citations with a rationale for inclusion: To be coded as having a rationale, the reviewer must provide an explanation that describes that there was a failure to properly attribute in the manuscript; important information that is not included in the manuscript, but is relevant, and will be addressed by the recommended citation; or that there are important inaccuracies in the manuscript that will be addressed by including a discussion of the recommended citation. We will not evaluate the merits of the rationale.

Number of citations with a rationale — author or co-author: Enter the number of zcitations with a rationale authored or co-authored by the reviewer.

Number of citations without a rationale: Self-citations that are included without an explanation will be coded as not having provided a rationale.

Number of citations without a rationale — author or co-author: Enter the number of citations without a rationale authored or co-authored by the reviewer.

If published, how many self-citations appear in published manuscript: Number of citations mentioned in the review appearing in the final version of the manuscript. Final published manuscript needs to be consulted. Code this NA if manuscript is rejected or if there are no self-citations.

Appendix 2. Examples of citations with and without reviewer rationales

With rationale	Without rationale
The authors have not included more recent citations that are relevant….	The authors have not included some relevant citations….
Other studies have used different cut points….	Please cite….
Prevalence rates should be included….	Other relevant citations include….
The citations in the manuscript focus largely on North American sources, but should also include European studies….	The following citations were not included….
The study findings should be discussed in light of a recent study by….	The authors could include these references….
The authors may consider 4 trajectories, as reported by….	It appears that the authors are not familiar with another study on this topic….
The authors state that little is known about frequency and associations of…but omit a study by….	
There are studies on how non-participation rates may influence results, and I would like to see a discussion of this….	
The introduction neglects a number of studies that have found an increased CVD risk among youth with bipolar disorder….	
Some discussion of other studies that have examined the role of personality in cancer outcomes would help to place the framework within which this study was carried out….	

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