Sources of Validity Evidence for Educational and Psychological Tests: A Follow-Up Study

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Abstract
This study followed up on previous work that examined the incidence of reporting evidence based on test consequences in Mental Measurements Yearbook. In the present study, additional possible outlets for what has been called “consequential validity” evidence were investigated, including all articles published in the past 10 years in several applied journals devoted to educational assessment and educational policy, and all presentations at recent annual meetings for the three organizations that sponsor the Standards for Educational and Psychological Testing (American Educational Research Association, American Psychological Association, and National Council on Measurement in Education). Consistent with previous findings, consequences of testing as a source of validity evidence is essentially nonexistent in the professional literature and applied measurement and policy work. The article concludes with implications of these findings for extending and refining current validity theory and validation practice.

Keywords
validity, consequences, consequential validity

A variety of instruments is used in educational and psychological research and practice to obtain information for theory building and decision making. The data obtained from administering tests are often used as part of a process that results in consequential
decisions about individuals or systems, including, for example, judging the effectiveness of educational and psychological interventions, awarding high school diplomas, selecting employees, issuing credentials or licenses in a profession, and countless other situations. Because such instruments are integral to the training, practice, development, and research in the social sciences, the quality of the data resulting from the tests is always of primary importance (Cone & Foster, 1991). Investigating and improving the quality of the information yielded by educational and psychological instruments is the core interest of measurement specialists and an essential concern for test users and consumers of test information. As noted by Cone and Foster (1991), it is imperative that those who use tests are enabled to “evaluate whether the data they obtain so cleverly and analyze so complexly are any good in the first place” (p. 653).

One of the characteristics evaluated when judging the quality of test information is validity. Although the concept of validity has evolved appreciably over the past 50 years (Geisinger, 1992), the primacy of validity has been consistently and enthusiastically endorsed. More than 40 years ago, Ebel (1961) referred to validity as “one of the major deities in the pantheon of the psychometrician” (p. 640); the current edition of the Standards for Educational and Psychological Testing (hereafter, Standards) identifies validity as “the most fundamental consideration in developing and evaluating tests” (American Educational Research Association [AERA], American Psychological Association [APA], & National Council on Measurement in Education [NCME], 1999, p. 9). In contrast, validation practice has frequently and consistently been critiqued as anemic. Continuing to the very next sentence of the quotation by Ebel just cited, he observed that “the good works done in [in the name of validity] are remarkably few” (p. 640). More recently, Brennan (2006) has asserted that “validity theory is rich, but the practice of validation is often impoverished” (p. 8).

The current AERA, APA, and NCME (1999) Standards identify five sources of validity evidence: (a) evidence based on test content, (b) evidence based on internal structure, (c) evidence based on relationships to other variables, (d) evidence based on response processes, and (e) evidence based on consequences of testing. Of these, evidence based on the consequences of testing—or consequential validity as has become the shorthand term—has proven to be highly controversial and contested. Although origins of the concept can be traced back to Cronbach (1971), it is most closely associated with Messick (1989), who explicitly incorporated the notion of consequences into validity theory in his influential chapter in the third edition of Educational Measurement (Linn, 1989). In a $2 \times 2$ matrix, Messick presented what he referred to as the four facets of validity. The matrix comprised four cells at the intersections of Test Interpretation and Test Use on one margin and Evidential and Consequential bases on the other.

Whereas some cells in the matrix captured noncontroversial aspects of validity, the intersection labeled “the consequential basis of test use” or consequential validity has provoked lingering debate. Kane (2001) has noted that “consensus has not been achieved on what the role of consequences in validation should be” (p. 328); Brennan (2006) has observed that “the most contentious topic in validity is the role of consequences” (p. 8). The controversy lingers, in part, because of seemingly orthogonal
perspectives. For example, although some of those concerned about validity have expressed the opinion that “the matrix was a mistake” (Shepard, 1997, p. 6), others have asserted that “the consequences of an assessment procedure are the first and most important consideration [italics added] in establishing the validity of the assessment” (International Reading Association and the National Council of Teachers of English, 1994, p. 17).

Investigating Consequential Validity

A recent article in *Educational and Psychological Measurement* reported on a study that provided additional insights into the notion of consequential validity (see Cizek, Rosenberg, & Koons, 2008). The researchers investigated aspects of validity reflected in published measures currently used in educational and psychological tests by reviewing validity information appearing in the *Mental Measurements Yearbook* (MMY; Spies & Plake, 2005), a leading testing reference resource containing synopses of validity evidence for 283 published instruments spanning a wide variety of measurement purposes, including educational achievement, ability, personality, career guidance, personnel selection, and others. Results of that study indicated that a particular source of validity evidence—evidence based on test consequences—was essentially absent from test information and not routinely collected or reported. Specifically, whereas construct, concurrent, and content validity evidence were provided fairly frequently (in 58.0%, 50.9%, and 48.4% of the tests, respectively), evidence based on test consequences was noted for only two tests (0.7%). The authors commented that it would seem reasonable to expect that considerable attention would be given to what is deemed alternatively to be one of, or the first and most important, source of validity evidence and that the nearly complete absence of attention to consequences suggested that consequential validity has been tacitly ignored by many, perhaps most, measurement specialists. The authors concluded that “test producers generally—and correctly—reject consequential validity” and that “the most straightforward explanation is that consequential validity simply does not exist” (Cizek et al., 2008, p. 410).

However, generalizing about the concept of consequential validity from the analysis of a single resource (i.e., MMY) is somewhat tenuous, and a replication of the preceding analyses using different and diverse sources of information seems warranted to reach more confident conclusions about validity evidence based on test consequences. Thus, the purpose of the research reported in this brief note was to search other potential outlets and producers of validity evidence to determine if the earlier finding was idiosyncratic or reproducible.

Method

Two additional sources of information were identified as potential outlets for reports on consequential validity. First, whereas the publication of MMY lags somewhat behind test development and validation efforts, it might be reasoned that more timely
information about consequences of testing might appear as part of reports on validation efforts. That is, it is possible that the long timeline for test development, validation, and eventual review and publication in *MMY* in 2005 may have precluded some very recent validation work involving evidence about test consequences from appearing in that source. To address this concern, we identified eight applied measurement and testing policy-related journals that could at least potentially publish information related to consequences of testing as a source of validity evidence. The sample of journals included online only and print/online publications, and consisted of the following: *Educational Assessment*, *Educational Evaluation and Policy Analysis*, *Educational Measurement: Issues and Practice*, *Educational Policy*, *Educational Policy Analysis Archives*, *Educational and Psychological Measurement*, *Measurement and Evaluation in Counseling and Development*, and *Practical Assessment, Research & Evaluation*. All issues of each journal for the 10-year period between 1999 and 2008 inclusive were examined. Each article in each issue was examined for whether it focused on validity, and, if so, the article was further scrutinized for mentions of information related to validity evidence based on test consequences.

Second, recalling that “evidence based on test consequences” is listed as one of the five sources of validity evidence in the *Standards*, it seemed appropriate to search for validation efforts involving consequential validity among the three sponsoring organizations of the *Standards*: namely, AERA, the APA, and the NCME. The data source for this investigation was the annual meeting programs of each of the three sponsoring organizations. Within a given year, session titles, symposia, individual presentation titles, and keywords for each conference program were searched for the following terms: *validity*, *validation*, *consequences*, and *consequential*. At the time of data collection, the researchers had access to very recent information from each organization’s annual meeting and analyzed the two most recent years available for each organization: AERA (2007, 2008), APA (2007, 2008), and NCME (2007, 2008).

**Results**

The first research question sought to identify incidence of research or information on consequences of testing as a source of validity evidence in recent publications appearing in applied measurement and educational policy journals over the 10-year period from 1999 through 2008. The results of these analyses are shown in Table 1. The columns of Table 1 show the name of each journal, the total number of articles published in the journal between 1999 and 2008, the number and percentage of articles in a journal that addressed validity, and the number of articles in which consequences of testing were treated in the context of validity evidence. For example, in the first journal listed in Table 1, *Educational Assessment*, there were 109 articles published between 1999 and 2008. Of those, 51 (46.8%) had a focus on validity; however, in none of the articles was evidence based on test consequences provided or described. Overall, out of 2,408 published articles, 1,007 (41.8%) of which touched on validity, no report provided information related to consequences of testing as a source of validity evidence. In one article that came closest to meeting the criterion, “a validation study to obtain
consequential evidence for state assessment and accountability programs is proposed [italics added]” (Lane & Stone, 2002, p. 23); however, the article did not actually gather and report validity evidence based on test consequences. These results indicate that although validity is a frequent topic of research reports in applied policy and assessment journals, consideration of consequences of testing as a source of validity evidence was completely absent over the recent 10-year span studied.

The second research question investigated whether the validity evidence based on consequences of testing could be found in presentations of research at the annual meetings of the organizations that sponsor the *Standards* (AERA, APA, & NMCE, 1999). It seems plausible that greater sensitivity to that topic might be evident with respect to the organizations that sponsored the document that codified test consequences as a source of validity evidence. Table 2 shows the results of analyses of conference presentations using the following keywords and search terms: *validity*, *validation*, *consequences*, and *consequential*. The results in Table 2 are presented separately for two recent, contiguous annual meetings of the three organizations. Consider the first annual meeting for each pair presented in Table 2; that is, the 2007 AERA annual meeting, the 2007 APA annual meeting, and the 2007 NCME annual meeting. The results for these years indicate that across the three associations, validity ($n = 30, 47, 5$ presentations, respectively) and validation ($n = 24, 42, 1$, respectively) are addressed by the researchers and practitioners who participate in annual meetings. However, across the three organizations, very little attention was paid to

<table>
<thead>
<tr>
<th>Journal Name</th>
<th>Total Number of Articles, 1999-2008</th>
<th>Number (%) of Validity Articles</th>
<th>Articles Including Consequences as Validity Evidence</th>
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</thead>
<tbody>
<tr>
<td><em>Educational Assessment</em></td>
<td>109</td>
<td>51 (46.8)</td>
<td>0</td>
</tr>
<tr>
<td><em>Educational Evaluation and Policy Analysis</em></td>
<td>189</td>
<td>73 (38.6)</td>
<td>0</td>
</tr>
<tr>
<td><em>Educational Measurement: Issues and Practice</em></td>
<td>323</td>
<td>61 (18.9)</td>
<td>0</td>
</tr>
<tr>
<td><em>Educational Policy</em></td>
<td>376</td>
<td>80 (21.2)</td>
<td>0</td>
</tr>
<tr>
<td><em>Educational Policy Analysis Archives</em></td>
<td>441</td>
<td>68 (15.4)</td>
<td>0</td>
</tr>
<tr>
<td><em>Educational and Psychological Measurement</em></td>
<td>642</td>
<td>486 (75.7)</td>
<td>0</td>
</tr>
<tr>
<td><em>Measurement and Evaluation in Counseling and Development</em></td>
<td>177</td>
<td>101 (57.1)</td>
<td>0</td>
</tr>
<tr>
<td><em>Practical Assessment, Research &amp; Evaluation</em></td>
<td>151</td>
<td>105 (69.5)</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2,408</strong></td>
<td><strong>1,007 (41.8)</strong></td>
<td><strong>0</strong></td>
</tr>
</tbody>
</table>
the topics of consequences ($n = 6, 0, 1$). The intersection of the terms consequential and validity was never found.

A review of all article titles and session descriptions identified using any of the search terms was conducted to ensure that some cases of consequential validity were not overlooked. For example, it was possible that a presentation identified with the keyword validity might address the validity of a test use or the effects of a test. However, that was never the case. In all instances, validity research reports were clearly focused on content, predictive, concurrent, or construct validity concerns. Finally, an in-depth review of the few cases in which “consequences” or “consequential” appeared (7 and 0 instances, respectively, for the first year of each annual meeting studied) was done. This analysis revealed that the topic addressed was never the consequences of a test but the consequences of a policy. For example, of the six AERA papers presented in 2007 with “consequences” in the title or description, three addressed the consequences of the accountability requirements of the No Child Left Behind Act (2001), two addressed the consequences of a specific state accountability system, and one addressed consequences of implementation of a preservice teacher portfolio. Of the eight sessions on consequences at the 2008 AERA meeting, one paper addressed the consequences of academic ranking, three addressed student grouping practices, one focused on theory in special education, one examined the impact of inadequate education, and one investigated school choice. In summary, all the presentations on consequences at the conference addressed systemic consequences, not those of specific tests or instruments, and none addressed consequences as a source of validity evidence.

### Conclusions and Implications

The research reported here was conducted to replicate the study by Cizek et al. (2008) that found one source of validity evidence—that of evidence based on consequences of testing—to be routinely ignored in the presentations of validity evidence published

### Table 2. Incidence of Consequential Validity in Professional Association Presentations by Year

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</tr>
</thead>
<tbody>
<tr>
<td>Validity</td>
<td>30</td>
<td>28</td>
<td>47</td>
<td>36</td>
<td>5</td>
<td>7</td>
<td>153</td>
</tr>
<tr>
<td>Validation</td>
<td>24</td>
<td>32</td>
<td>42</td>
<td>26</td>
<td>1</td>
<td>1</td>
<td>126</td>
</tr>
<tr>
<td>Consequences</td>
<td>6</td>
<td>23</td>
<td>0</td>
<td>16</td>
<td>1</td>
<td>1</td>
<td>47</td>
</tr>
<tr>
<td>Consequential</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>54</td>
<td>83</td>
<td>89</td>
<td>78</td>
<td>7</td>
<td>9</td>
<td>326</td>
</tr>
</tbody>
</table>

in the MMY. Other data sources were used for the present study, but the results confirm the previous findings. Specifically, in a sample of applied measurement and testing policy journals over the past 10 years, including more than 2,400 articles, many of which dealt with validity, there were no instances in which validity evidence based on test consequences was presented or described. And, in a review of two recent years of the annual meeting programs for the three professional associations sponsoring the Standards, there was no research presented in which information on test consequences was gathered or summarized as part of a validity investigation. Whereas the previous study by Cizek et al. (2008) was limited to a review of validity evidence presented by test publishers, the data sources for this study were not limited to narrow, technical, or purely psychometric perspectives, but were considerably broader, including reports in testing policy journals, applied measurement journals, and papers presented at professional conferences spanning a wide variety of specializations. It now seems fairly clear that consequences of testing are routinely ignored as a source of validity evidence. Several questions should now be addressed, including the following: Why would one source of evidence be totally absent in such work, when all other sources of validity evidence are routinely reported and summarized? What do these results imply about the state of validity theory and validation practice? And, finally, what kinds of work must be done to move validity theory and practice forward?

**Possible Explanations for the Absence**

There are potential explanations for the remarkably consistent tendency for researchers and practitioners to ignore the collection and reporting of what is called consequential validity evidence. For one, it might be argued that consequences cannot be observed and studied until after a test has been in operational use for some time and that more time is needed. However, this explanation is easily rejected. The concept of evidence based on test consequences has been a feature of validity theory for at least two decades since the publication of Messick’s (1989) influential chapter on the topic; it has been more than a decade since the concept was formally recognized as a legitimate source of validity evidence in the Standards (AERA, APA, & NCME, 1999). It would seem that ample time has elapsed to permit publication of validation efforts in which test consequences are reported and synthesized into coherent validity summaries.

Another second possible explanation for the absence of attention to the particular source of evidence known as consequential validity could be that such evidence is more difficult or more costly to gather and that those engaged in validation efforts favor easier, cheaper sources. This hypothesis might warrant further investigation, but it cannot fully explain the absence. In the commercial testing marketplace, it would be a competitive advantage for a test publisher to gather and report validity evidence that competitors did not. Furthermore, in noncommercial testing research and development, it would seem reasonable to expect that at least some attention would be given to what has been argued is a primary source of validity evidence. It seems highly unlikely that, if it could be gathered, evidence based on test consequences
would never be presented in any of the thousands of academic outlets (MMY reviews, articles, and conference presentations) that have been examined. An alternative explanation for the absence of attention to what has been called consequential validity is needed.

**An Alternative Hypothesis**

We believe that a plausible alternative hypothesis is that researchers and practitioners do not gather or report evidence on validity based on consequences because it is not possible to include consequences as a logical part of validation. The results of the present research add weight to the conclusion proposed by Cizek et al. (2008) in an earlier study, that consequential validity is “simply a flaw in modern validity theory” (p. 410).

One root of the flaw can be found in Messick’s (1989) formulation of validity as “an integrated evaluative judgment of the degree to which empirical evidence and theoretical rationales support the adequacy and appropriateness of inferences . . . based on test scores” (p. 13). For any source of evidence to be a part of a coherent validity argument, that source of evidence must be amenable to the integration Messick described. Evidence based on test consequences is not. To illustrate this problem, we can consider the hypothetical case of a test developed to yield inferences about “test anxiety.” As part of an integrated evaluative judgment, it would be necessary to gather evidence that the test was grounded in a theory of test anxiety, that the test content was aligned to accepted operationalizations of test anxiety, and that hypothesized relationships were confirmed between scores on the test anxiety instrument and tests measuring similar constructs. An integrated, evaluative synthesis is never a simple averaging of correlations or purely quantitative enterprise. Rather, judgment must be brought to bear in all instances to arrive at a conclusion about the degree to which the theoretical and empirical evidence supports the accuracy of the intended score inferences. These professional judgments are necessarily subjective and value laden, but perhaps especially so when the evidence is mixed and some evidence speaks more loudly. In our example, perceived stronger evidence based on analyses of the content of the test anxiety instrument, on the instrument’s internal structure, or on hypothesized relationships between variables such as convergent validity coefficients with other anxiety measures, might compensate to some degree for perceived weaker evidence with respect to the theoretical rationales underlying the measure. Indeed, as the research reported here and elsewhere has demonstrated, journals, research reports, and test reviews provide numerous examples of how these sources are routinely and successfully integrated to yield stronger or weaker conclusions about the validity.

However, even if evidence were available about the consequences of using the test anxiety instrument, it would seem impossible for it to be synthesized with other sources of evidence to result in an overall, coherent judgment about appropriate score inferences—that is, about validity. For example, evidence that the test did not reflect theoretically accepted notions about test anxiety or did not correlate as expected with
other measures of that construct could not compensate for evidence that use of the test anxiety instrument yielded benefits for certain examinees or even desirable social benefits. Such information does not—positively or negatively—affect the accuracy of the intended inference about test anxiety. In all instances, evidence about the extent to which a test yields accurate inferences about a construct and evidence about the broader consequences of administering the test are not compensatory in any logical sense and cannot be combined into a coherent, integrated evaluation. Any attempt to perform an integrated evaluative judgment based on these divergent and qualitatively different sources of information cannot yield sound conclusions about either the scientific meaning of the examinee’s performance or the social desirability of using the test.

We believe that this noncompensatory nature of consequential evidence is at the root of the widespread failure to attend to the consequences of test use when syntheses of validity evidence are put forward by test publishers, in journals, and so on. Indeed—and this fact seems compelling—it appears that no such synthesis has ever been produced. That is, in no instance has evidence based on test consequences been brought to bear with other sources of validity evidence to yield a coherent, overall case for or against the validity of scores derived from an instrument in education or psychology.

There would now seem to be fairly abundant evidence to suggest that further documentation of the absence of attention to consequences of testing as a source of validity evidence is unnecessary. Although it may be possible to suggest other explanations for why a putatively vital source of validity evidence is uniformly ignored in research reports, articles, and other sources, none is as parsimonious as the proposition that evidence based on test consequences cannot meaningfully be incorporated into validity theory or into validation practice. A more tenable conclusion is that consequential validity does not exist.

**Implications for Validity Theory and Practice**

We believe that there are far-reaching implications of this conclusion. If consequential validity does not exist and its incorporation into modern validity theory was an error, one reaction would be to simply discard the concept. Such a reaction would be ill-advised and would not likely be accomplished easily. We note, for example, the difficulty of altering the commonly encountered—albeit incorrect—notation that “a test is reliable” in favor of the more accurate representation that it is the scores yielded by a test that are supported (or not) by the reliability evidence (see Thompson, 2003). We believe that the error of including consequences in modern validity theory should not simplistically be redressed by simply excising consequences from the theory. The consequences of testing are real, diverse, important, and warrant consideration and evaluation.

Although the objective of the present research was primarily to understand if the absence of attention to consequences was a pervasive characteristic of validity work, we believe that the documented and widespread failure to include evidence
based on consequences into validity summaries must not be interpreted as a call for even less attention to the topic. On the contrary, even greater alacrity in studies of test validity and consequences of test use is needed. We add our voices to the multitude of measurement specialists and others who have consistently prodded testing developers and test users to ramp up validation efforts. As Brennan (2006) has bluntly observed, “Validity theory is rich, but the practice of validation is often impoverished” (p. 8). A first implication is therefore that increased attention should be paid both to assuring confidence in the meaning of test scores and to investigating the consequences of test use.

This point leads to a second implication. A distinction must be made between evidence supporting the intended inferences from test scores and evidence supporting a test use. Validity theory must be refined to differentiate between validation of score inferences (i.e., the methods and sources of information relevant to determining the confidence that is warranted regarding the intended meaning of a test score) and justification of test use (i.e., the methods and sources of information—including consequences—brought to bear on the question of whether it is a good idea to use a given test in the first place). On this point, we would also assert what may be obvious: Strongly supportive evidence regarding the former is a necessary but insufficient condition for the latter.

If consequences are freed from validity and treated as an area of inquiry in their own right, a third, more fundamental, implication arises regarding the very definitions of validity and validation. Messick’s (1989) chapter classically defined validity as “an integrated evaluative judgment” (p. 13) but, as has been described elsewhere (Cizek, 2010), that definition conflates validity (a property) with validation (a process). Other validity theorists have also recognized a fundamental problem with the current definitions of validity and validation. For example, Borsboom, Mellenbergh, and van Heerden (2004) have noted that “these terms are sometimes used interchangeably in the literature, but they are not the same” and “validity is a property, whereas validation is an activity” (p. 1063). Remarkably, theoretical work on validity has neglected to propose definitions of the terms. For example, neither Kane’s (2006) more recent chapter on validity nor any of the chapters in the book on validity by Wainer and Braun (1988) offer definitions. Both theory of validity and the practice of validation would likely benefit from crisp operational definitions of these important concepts.

Fourth, the practical guidelines that exist for best practices in test validation (e.g., the Standards) must be revised to account for the place of consequences in a comprehensive approach to defensible test use. Whereas it would be appropriate to revise the list of relevant sources of validity evidence in the Standards to eliminate what has come to be called consequential validity, it would not be appropriate if the Standards were completely silent regarding the consequences of testing. Ideally, it may be desirable if a revision of the Standards contained separate sections that distinguished between two equally important areas: expectations for professional practice with respect to Validity of Score Inferences and professional standards in the area of Justification for Test Use.
Finally, as regards the validity of score inferences, there exist long and well-developed traditions for how evidence supporting test score inferences can be gathered and interpreted. However, there exist no comparably long-lived or broadly accepted traditions for justifying the use of a test. It seems clear that information about the consequences of using a test would likely be a source of evidence to help make the case for or against justifying a particular test use, but they would not be the only source. Among other things, the human and financial resources expended in using the test would require analysis to determine if the use was justified in those terms. The policy goals of using the test in the first place might be examined in light of other policy goals to which resources might have been allocated. The benefits of using one test versus another or versus nontest alternatives intended to accomplish the same goals might also be examined. The appropriate persons and perspectives that should be represented when engaging in these analyses would also require clarification. In short, because theory, practice, and guidelines for justifying test use are far less well-developed than for validating score inferences, we believe that much work must be undertaken to begin investigating and formalizing guidelines that could be as broadly embraced regarding justification efforts as the Standards have become for validation efforts.

These implications are not trivial and portend significant changes in the theory and practice of developing and appraising educational and psychological tests. If consequences are not a part of validity, then the concept of validity must be reconceptualized and distinguished from test use; the focus of validation on gathering evidence to support score meaning must be reaffirmed; and a new research enterprise aimed at developing the sources of evidence that support justification for test use must be undertaken. Ultimately, it is hoped that a clearer distinction between the validation of score inferences and justification of test use will facilitate more complete and searching efforts toward both concerns, enhancing the quality and utility of test results and enabling those who develop and use tests to improve the outcomes for the clients, students, organizations, and others that are the ultimate beneficiaries of high-quality test information.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interests with respect to the authorship and/or publication of this article.

Funding

The authors received no financial support for the research and/or authorship of this article.

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