Author's response to reviews

Title: A cross-sectional pilot study of the Scottish Early Development Instrument: A tool for addressing inequality

Authors:

Lisa M Woolfson (lisa.woolfson@strath.ac.uk)
Rosemary V Geddes (rosemary.geddes@ed.ac.uk)
Stephanie McNicol (stephaniemcnicol@hotmail.com)
Josephine N Booth (j.booth@dundee.ac.uk)
John Frank (john.frank@ed.ac.uk)

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Author's response to reviews: see over

Please find below the reviewers’ comments (exactly as they appeared) and the authors’ responses (in red). All the authors have contributed to and approved these changes. We hope that the changes to the paper are sufficient to warrant publication.

Thank you

Yours sincerely

Dr Rosemary Geddes (corresponding author)

Reviewer 1

This paper tested the validity of the Early Development Instrument for use in a Scottish school district. It conducted an initial pilot of the original EDI on a small sample, then made minor adjustments and tested the revised version, known as the SEDI, on a larger sample. The instrument displayed high internal reliability and was able to identify significant differences by deprivation and gender. Overall, this is a good paper, looking at an interesting topic with definite policy relevance for Scotland. In particular, it demonstrates the time and cost implications of rolling out SEDI testing in Scottish Local Authorities. In addition, there is a nice comparison of the results of the Scottish study to findings in Canada and Australia. However, there are a couple of issues which could enhance the paper if addressed:

Major Compulsory revisions

(i) On page 8 under ‘Procedure’ the authors should make it clear how the instrument was completed i.e. paper and pen or web-based. The EDI is usually administered through an online web-survey. From the text it is not clear how the assessment was administered in either the first or second phase.

Page 8, 2nd sentence under heading Procedure, this has been clarified for both phases.

(ii) For those unfamiliar with the Scottish educational system, could the authors please provide a short explanation of the Scottish primary school system, such as the minimum and maximum school starting age? The children were on average 5.7 years at phase 1 and 5.51 years at phase 2? Is this the first year of primary school? Did the children already spend a year in kindergarten? Also, the end of page 8 refers to ?independent schools? - what are these?

At the top of page 7 a short paragraph has been provided entitled ‘The Scottish Context’ explaining the Scottish school system and the meaning of independent school.

(iii) Could the authors state when the assessment took place during the school year i.e. how long did the teachers know the children when they made the assessment? The text on page 5 states? some months?, but how many months exactly?
Page 5, under title, The Early Development Instrument, 9th line, we have changed ‘some’ months to ‘four’ months.

(iv) What were the teacher response rates? Page 9, middle of first paragraph ‘(100% teacher response rate)’ added.

Were teachers compensated for conducting the assessment?

Page 8, under ‘Procedure’, 3rd sentence explains this.

(v) There is no discussion on the extent of item-level missing data on the SEDI or how missing data were handled. There is a sentence on page 10 of the ‘Reliability’ section which states that ‘item deletion did not significantly improve reliabilities’, which suggest that there were missing data, however how much

‘Item deletion’ is not about missing data but is about questionnaire construction. It is about removing whole questionnaire items that may have been problematic, confusing or misunderstood, to see if that improves the internal consistency of the questionnaire. So this sentence does not in itself imply anything about missing data.

In terms of how missing data were handled, participants (pupils) who had 30% or more of the questionnaire items missing or/and all those who had more than 1 scale of domain data missing were excluded. There was only 1 pupil excluded on the latter grounds. This is explained in the footnote at the bottom of page 9.

Reviewer 2

Major Compulsory Revisions

- When reading in the title ”a tool for addressing inequality”, the reader expects an analysis of inequalities and a discussion on ways to address inequalities with a potentially new tool that will be usable in other contexts. However the present study focuses on validating an instrument to use in an inequality analysis. The outcome of the research is therefore much more restrictive that what the title suggests.

The authors feel that the title could not be more concise and descriptive:

- it gives the type of study
- it clearly states that we are describing a pilot in Scotland of a tool or instrument which is used widely in other parts of the world to assess differences in child development in different socioeconomic groups
- the overall aim is to reduce SES inequality

- It would be useful to clearly states that the SEDI uses proxy-respondents (teachers) and so, the instrument will suffer from reporting bias. Typically it could be expected that for the same child two teachers won’t complete the questionnaire the same way. How has this been addressed in the study? Have the researchers tested the likelihood of reporting bias by doubling some interviews and compare discrepancies?
It is not possible to ‘double the interviews’ since, as explained in the paper, the children are not
‘interviewed’ rather the teacher completes the questionnaire without the children present, based on
his/her knowledge of the child over the past 4-5 months. It would be difficult/unlikely to find a
second teacher in each school who knows the child as well as the child’s own class teacher.
Extensive reliability testing has, however, been conducted by the designers of the tool. Both Test-
retest reliability (using Pearson correlation coefficient) and Intra-rater or within-teacher reliability
(using intra-class correlation coefficient) tests have been conducted. Both have shown high
coefficients of between .7 and .96. A paragraph on the limitation of reporting bias and how the
designers of the tool have addressed this has now been added on page 15 at the end of Discussion.

A number of studies in quality of life outcomes for children have discussed the use of proxy-
respondent and so this paper could review some of those elements at least in the discussion section
(see Pickard, S., Knight, S.J.: Proxy evaluation of Health-Related Quality of Life. Med. Care 43(5),
Starfield, B., Green, B., Robertson, J., Tambor, E.: Elementary school-aged


- The paragraph before Discussion ends with "this is very affordable for the average LA", what are
the arguments for this? Do the authors have an idea of the amount of the budget and the willingness
to pay for such instruments?

The authors have presented these findings to a number of local authority education leaders and
many of these leaders have shown great enthusiasm and at least three LAs have expressed
willingness to pay for the EDI to be conducted every 3 years in their LA. Local Authority leaders,
however, would prefer financial and statistical support, to come from Central Government. At this
stage in Scotland, the issue of who would fund and manage such a triennial census of early child
development is under discussion and is a sensitive process. We therefore do not want to publish the
views and willingness of local authorities as it may influence the decisions of Central Government.

Local authority budgets can be found in various publications (e.g. Bell, David. Report on the Draft
Scottish Budget 2013-2014, Stirling University, 2012.).

Minor Essential Revisions

In the abstract, Background section, several elements are very unclear.

Please clarify who is "us" in "to allow us to target tailored interventions".

The abstract has been adjusted to clarify this (line 6).

Similarly "at a reasonable cost" is very elliptic, which cost is it about? who would support it? what do
you mean by reasonable?

Again, as mentioned already above, who should fund the collection of population-level data on child
development in Scotland is being debated. In Australia data collection for the Australian
Development Index is funded, managed, analysed and reported by central government. This would
be ideal, however, since local authorities in Scotland currently receive funds, some of which is for monitoring, there are those that argue that LAs should fund it. We do not want to enter this polarized debate in this paper.

‘Reasonable’ here would simply mean affordable and economical in the eyes of the funder.

Please clarify if the 7 children for which income quintile was not informed have been completely excluded from the study (end of procedure subsection).

They have only been excluded from results which require socioeconomic status quintile e.g. they are not included in Table 3. At the foot of Table 3, the sample sizes (N) are shown: 39+232+226+406+180=total 1083. This is the full 1090 minus 7 (= 1083) whose SES postcode grouping were not known.

Reviewer 3

Minor Essential Revisions

On page 5 please elaborate on the context of school entry. What is the minimal age for children to start P1. What determines if a child attends a preprimer school compared to P1?. What determines if a child is starting p1 at age 6?

This has now been explained under The Scottish Context on page 7.

On Page 7 first paragraph beginning "within Scotland". Please change grammar from "identify early years' inequalities" to identify inequalities in early childhood."

Done

On Page 7 as part of your phase 2 objectives please clarify what psychometric properties and discriminatory ability you are referencing. Specifically are you referring to discriminating communities where children are well prepared for school compared to communities where children and their teachers are managing complex challenges? Yes Please clarify.

This has been clarified on page 8.

On Page 9 please use a footnote to describe in detail how many children had missing data or special needs.

Done

In addition to rating children's competencies Physical Well Being, Language and Cognitive Skills, and Social and Emotional Development, Teachers expressed their concern about a child struggling to do their school work and if they were needing further assessment, on a waiting list for further assessment or receiving school based supports. Is there any correlation between these summary indicators of overall functioning and the children who are developmentally vulnerable? Please describe.

Chi square analyses, showed each of these indicators:
- child struggling to do their school work
- needing further assessment
- on a waiting list for further assessment
- receiving school based supports

to be significantly associated with vulnerability on one or more domains.

This has been added at the end of Results.

In the discussion please help the larger audience understand what initiatives are taking place in Scotland to improve children’s early health, behavioral and developmental competencies and their caregivers knowledge of child development.

A paragraph has been added to describe some initiatives and policy changes. Under Discussion, 6th line in paragraph 3 starts with “This is particularly relevant in Scotland where…..”

**Additional Editorial Request:**

1.) Copyediting:

After reading through your manuscript, we feel that the quality of written English needs to be improved before the manuscript can be considered further. We advise you to seek the assistance of a fluent English speaking colleague, or to have a professional editing service correct your language. Please ensure that particular attention is paid to the abstract.

The abstract has been rewritten and the paper reviewed by fluent English speakers.