

PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form ([see an example](#)) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below. Some articles will have been accepted based in part or entirely on reviews undertaken for other BMJ Group journals. These will be reproduced where possible.

ARTICLE DETAILS

TITLE (PROVISIONAL)	Validation of a questionnaire measuring preschool children's reactions to and coping with noise in a repeated measurement design.
AUTHORS	Persson Waye, Kerstin; van Kamp, Irene; Dellve, Lotta

VERSION 1 - REVIEW

REVIEWER	Anita McAllister, Linköping University
REVIEW RETURNED	05-Jan-2013

THE STUDY	<p>In the background the authors give an overview of factors associated with high noise levels, however voice and voice complaints/disorders related to noise exposure in preschool teachers and children are not mentioned despite a high prevalence. Children's activities and voice use are regarded as the main noise sources in a preschool setting.</p> <p>METHODS Methods in the present study are not sufficiently described. Included in the study are 63 (61/59) children 4-5 years old. No information about gender is given under methods or the distribution across preschools. A table similar to the one under results would help. The selected participants are not a result but rather a prerequisite for the study. How were the preschools selected? How long were the interviews? Where the interview recorded?</p> <p>How were the dossimeters mounted on the child? What techniques were used, microphone, number of channels, time frame etc? Could the effects of the child's own voice use be canceled out or how was it addressed?</p> <p>Also, it seems the authors have chosen to present some of the results under methods, or have I misunderstood and this is really another study but part of the larger project? Anyway, it is a bit confusing to the reader.</p> <p>Page 7 line 12-16: "The percentage of children who indicated that they never heard the sound was 17% and 19% for the yelling sounds, 22% and 22% for loud sounds and 35% and 52 % for the scraping and screeching sounds in the before and after condition respectively." If this is part of the results within the larger project it seems better to present it in the background. Published?</p>
RESULTS & CONCLUSIONS	I suggest a table for the values of pre- and post intervention values of noise, if it is part of the present study. Also, it would be interesting

	<p>to compare different preschools in this respect. The three factors in table 2 could be named to aid the reader, like source factors, coping factors and bodily reaction factors or symptom factors. Also it would be helpful if the names of the factors were used consistently throughout the paper. In the correlation part the last line f. Unwell-being should be changed to g. Unwell-being. The term is a bit strange to me but I am not a native speaker of English. Page 14 line7. un should be removed. Page 17 line 45-47. ...with a prevalence varying between 15-20%. This has not been indicated before. It would be interesting to see a figure of the distribution of symptoms across body location. Page 17 line 50-54. ...associated with general unwell-being while at school and these responses tend to be sound specific. Here also other interpretations are possible like poor academic results etc that the authors should mention. Did the focus group interview study involve the same group of children as the present paper?</p>
GENERAL COMMENTS	<p>This is interesting and commendable work. The effects of the sound environment in preschools on young children needs to be investigated and improved.</p>

REVIEWER	<p>Robert Moore Associate Professor and Chair University of South Alabama United States</p> <p>I have no competing interests with this manuscript.</p>
REVIEW RETURNED	<p>13-Jan-2013</p>

THE STUDY	<p>Research question clearly defined - I would expect a clearer detailing of the research question than is contained in the first few pages of this manuscript. I was unclear if the purpose was to validate a measurement (as suggested by the title) or to learn about the reaction of children to noise or both. The answer can be learned by reading the entire manuscript but should be clearer in the initial pages.</p> <p>Methods - in my opinion some of the descriptions in the methods are somewhat superficial. For example, part of the methods describes pre- and post-testing noise measurements. It is written that "stationary measurements and personal dosimeters" were used. However, the instruments used are not described (manufacturer, type, etc.). Although not specifically stated, it appears that the dosimeters were worn by children ("children's dosimeter") there is no information concerning where on the body they were worn and how this was monitored. Finally, why was this pre- and post-testing measurement done? It appears that intervention had no effect on noise level. While pre- and post-testing results are report, there is do discussion of this.</p> <p>Also, in the methods on page 7 under the heading of "Coping strategies", it is written that visual representations were used. What visual representations? Figure 1? If Figure 1, how do those relate to "put your hands over your ears", etc.</p>
GENERAL COMMENTS	<p>There are numerous typos in this manuscript. Check the usage of accept vs. except. Also, check the references for typos. I would suggest asking someone to proof read the manuscript before re-</p>

	submission.
--	-------------

REVIEWER	Charlotte Clark, Senior Lecturer in Environmental and Mental Health Epidemiology, Barts & the London School of Medicine, UK.
REVIEW RETURNED	14-Jan-2013

THE STUDY	<p>I think the sample is a little small to be able to adequately answer the research questions precisely and in detail.</p> <p>There are some small omissions about the participants, that can easily be addressed in a revision. I've outlined what I felt is missing in the author comments.</p> <p>I'm unclear about how the sample was selected so am also unclear about how representative they might be.</p>
RESULTS & CONCLUSIONS	<p>I would just say that I do feel the sample has limitations in being able to address the research questions in their entirety. I think that the paper would benefit from acknowledging this more clearly throughout. The results are only able to partly answer the research questions in places, due to lack of power and also the limited number of items in the questionnaire available.</p>
REPORTING & ETHICS	<p>I don't foresee any ethical issues but there is no statement about ethics in the paper.</p>
GENERAL COMMENTS	<p>Little is known about the effects of noise exposure on pre-school children, making the development of measures to assess young children's reactions to noise an important methodological development, with lots of potential applications.</p> <p>Background This covers the relevant material. I think it might be worth giving a lay introduction to noise exposure in the first paragraph, explaining what LAeq means and perhaps including some context about what guidelines/legislation there is concerning pre-school noise exposure in Sweden, and perhaps more widely such as the WHO guidelines. It would also aid the reader to include the ISO definition of annoyance in the introduction, where annoyance reactions in children are discussed. The objectives do not include any mention of the dosimeter part of the study.</p> <p>Materials and Methods In the description of the selection and recruitment it is not very clear how many children were from the intervention schools and how many were from the control schools. Could this be added to Table 1. I assume this was an opportunity sample, but it would be useful to say something about how the control schools were identified: were they matched to the intervention schools in any way? It would also help to speculate later in the paper how generalizable you think the findings of the study are, in view of the selection of the intervention and control schools.</p> <p>On page 5, I am not clear what is meant by the sentence 'Due to external circumstances no children were selected for the control group from preschools where no intervention took place'.</p> <p>Procedure – did all the children wear dosimeters? If not, how were these children selected.</p> <p>Noise perception – I do have some concerns that the questions about noise perception are predominantly negative; e.g. hearing</p>

	<p>children being angry and yelling; shouting, screaming and banging. Would a child have answered yes, if they heard a child yelling or did it have to be both angry and yelling? Are the descriptions of the different items exact translations of the translation of the original materials? There may be some overlap of interpretation of events, as well as more simple noise perception but it may simply be a language issue.</p> <p>There is a typo – load instead of loud.</p> <p>Results – there are some typos – ‘instable’ instead of ‘unstable’. Also ‘unwell-being’, needs to be reworded – perhaps ‘low well-being’.</p> <p>As the study summary suggests – more work on larger samples will need to be done to further develop a standard instrument in larger samples. This point needs to be made throughout the paper, as otherwise the low number of items and the low cronbach’s alphas may be misunderstood by the reader. It is quite difficult to evaluate the reliability and validity of the scales, as an intervention has taken place. There is a lot of variation in the factor loadings etc using the before and after data. This could also be a result of the fairly small sample, but this data is not very convincing. The scales have few items each, and within scales items often have low cronbach’s alphas – the change in alphas before and after are also worrying. My worry is that people may pick up this paper and use the scales as they are – this is encouraged at the end of the paper. My thoughts are that additional items are probably needed to increase the reliability of the scales.</p> <p>No limitations or strengths are given.</p> <p>Is there a danger that the dots rating scales draw the child to make a stronger answer? When you look at the scale, the larger 4 and 5 dot versions overshadow the other options. It might be worth trying an alternative scale in another sub-study to see if there is a methodological issue of this type, or not. This could perhaps be given as a limitation.</p>
--	--

REVIEWER	Goran Belojevic, Professor Faculty of Medicine, University of Belgrade Serbia
	I have no conflict of interest in this review.
REVIEW RETURNED	20-Jan-2013

THE STUDY	One sample should be used in two different conditons. Bodily reactions to noise should be omitted from this study.
RESULTS & CONCLUSIONS	The authors should omit the investigation of bodily reactions to noise as a research question!
	The authors have not proved that "the location of bodily reactions is a good and reliable way to measure reactions in young children"
GENERAL COMMENTS	Page 4, row 16, Citation: "This paper explores and describes the reliability and validity of the key questions of a standardized

interview protocol- the Inventory of Noise and Children's Health (INCH) -developed on the base of focus group interviews among 4-6 year old". For a questionnaire to become "standardized" it needs to be tested for sensitivity and specificity on a much larger sample and rechecked in several independent studies.

Page 4, Row 52, Citation: "In total, 63 children and 59 parents filled out the questionnaire before and after the intervention. A control group of twenty three parents from three preschools where no interventions were undertaken was also included in the study. Parental data will be reported elsewhere. Due to external circumstances no children were selected for the control group from preschools where no intervention took place".
I think it is not needed in a "subjects and method" section what was not done in a study. So, please omit mentioning parents and a control group of children!

Page 5, Row 19, I would not say that "as much as possible" in diminishing inter-rater variance is done by having two raters. The best way to do so would be to have only one rater for just 63 children, isn't it?

Page 6, Row 8, No need to mention measurements in control schools because these data are not relevant for this study.

Page 7. Row 6. It is questionable whether a child aged 4-5 years could make a difference on a five graded scale. I would rather use just three dotted pictures, with one, three and five dots! Try testing for internal consistency using three graded scales which are simpler and more clear!

Page 7. Row 12. Citation:" The percentage of children who indicated that they never heard the sound was 17% and 19% for the yelling sounds...? "No yelling in a preschool!?"

Page 7, Row 21, If you asked a child about his/her feelings on noise why would you show his/her body on pictures. Face is relevant! Here again, the use of a five graded scale instead of a simple three graded one is questionable. I would say that for a child aged 4-5 years body reactions showed on pictures 1-3 would be all the same. It stands also for pictures 4-5. As for face reactions a child could hardly tell the difference in reactions between pictures 1-2 and 3-4. Try testing for internal consistency using three graded scales!

Page 8, Row 5. Citation from the questionnaire: "Can you feel the sound inside you or in your body? And in what part of the body?" I would say that sounds are heard and not felt in some part of the body. A 4-5 year-old child might have understood this question as: "If something hurts me now it is noise!"

Page 8, First paragraph, Authors offer a small child to choose between his/her neck, arms, heart, belly, legs and feet where he/she "feels the sound inside". He/she may think: "Well, my feet ache me, it is because of children yelling!"

10. Page 10, Row 19. The number of interviewed children ranged from 4-15. A total of four children in an urban preschool?

	<p>Page 10. Table 1. If you compare the reactions to noise before and after an intervention you can do it only on the same sample of children in two different situations. Therefore, two dependent samples must not differ in the number of subjects, it is actually one sample with a total of 59 children with comparable data in two situations. The differences should be tested. How can you explain that there was almost three times lower percentage of children with a highly angry reaction to noise after intervention, but more children who often cope and with at least one bodily reaction, compared to before intervention? What do “(>11)” and “(>15)” mean in Table 1?</p> <p>Page 16, Row 41 Citation: “An important finding is that children compared to adults seem to have a tendency to describe reaction to noise in a somatic way: they literary feel the noise in their body, especially in the head, heart and tummy, with a prevalence varying between 15-20%”. I would not say you proved this! I would rather say that children misunderstood the question? More precisely, this question would not be understood by adults either!</p> <p>Conclusion: Omit “bodily reactions” from this study! Perform before and after analysis on one sample with comparable data for two different situations!</p> <p>Typos</p> <p>Page 2, Row 48, two full stops Page 2, Row 55, “effect” replace with “affect” Page 5, Row 45, “maths” replace with “mats” Table 2. Last row. “f” replace with “g”. Page 16, Row 54, “where” replace with “while”</p>
--	--

VERSION 1 – AUTHOR RESPONSE

Reviewer: Anita McAllister, Linköping University

In the background the authors give an overview of factors associated with high noise levels, however voice and voice complaints/disorders related to noise exposure in preschool teachers and children are not mentioned despite a high prevalence. Children's activities and voice use are regarded as the main noise sources in a preschool setting.

We regret having overlooked this and a reference is now included. (McAllister et al 2009.ref 10)

Methods in the present study are not sufficiently described. Included in the study are 63 (61/59) children 4-5 years old. No information about gender is given under methods or the distribution across preschools. A table similar to the one under results would help.

If it is allowed by BMJ open we would like to add another table (table 1). It is however important to stress that the article is aimed at describing and exploring the reliability and validity of the key questions of a structured interview protocol developed for preschool children. The reporting of the results from the intervention study will be done elsewhere, and in such a paper it will be highly relevant to describe in detail the source population, the study population and the study sites including full description of noise measurements. We have tried to clarify this by reducing the description of the

noise measurements (104-113) and by adding table 1 to the method section.(100 and onwards)

How were the preschools selected? The preschools were the seven preschools where the municipality started to undertake renovations in order to improve the acoustics. Since then, over a period of 5-6 years, all preschools of the municipality have been renovated.

How long were the interviews. The interview usually lasted on average between 15-25 minutes

Were the interview recorded? No recordings were done, the form was filled in directly by the interviewer. We have added an sentence on this (88-89)

How were the dosimeters mounted on the child? What techniques were used, microphone, number of channels, time frame etc? Could the effects of the child's own voice use be cancelled out or how was it addressed? The dosimeter were mounted on the shoulder of the child and in order make this work we constructed special vests which they wore. The vest had a pocket for the recorder. The dosimeter was SPARKS 705+. Two children at a time wore the dosimeter all the time they were indoors, from morning until afternoon. See line (106-113)

The effect of the child's own voice was included in the dosimeter levels reported as it can be considered as part of the total noise exposure. It is however an important topic that the reviewer raises and we have in a small study made specific measurements to address the complexity of the topic. This is reported elsewhere (Borg et al 2008), and is not considered to be of primary focus for this paper. Though it will be of importance for the intervention paper.

Also, it seems the authors have chosen to present some of the results under methods, or have I misunderstood and this is really another study but part of the larger project? Anyway, it is a bit confusing to the reader. We have moved these sections, these were indeed in the wrong place.(see 195-205)

Page 7 line 12-16: "The percentage of children who indicated that they never heard the sound was 17% and 19% for the yelling sounds, 22% and 22% for loud sounds and 35% and 52 % for the scraping and screeching sounds in the before and after condition respectively." If this is part of the results within the larger project it seems better to present it in the background. Published? We have moved this to the results to improve the clarity of the paper(see above)

I suggest a table for the values of pre- and post intervention values of noise, if it is part of the present study. Also, it would be interesting to compare different preschools in this respect.

As stated earlier, the paper is not intended to describe and report of the intervention, to make this as clear as possible we have now minimized the reporting of the noise measurements and sound levels.(see above)

The three factors in table 2 could be named to aid the reader, like source factors, coping factors and bodily reaction factors or symptom factors. Also it would be helpful if the names of the factors were used consistently throughout the paper.

This has been adapted

In the correlation part the last line f. Unwell-being should be changed to g. Unwell-being. The term is a bit strange to me but I am not a native speaker of English. Has been adapted according to suggestion by Charlotte Clark

Page 14 line7. un should be removed.

Has been adapted

Page 17 line 45-47. ...with a prevalence varying between 15-20%. This has not been indicated before. It would be interesting to see a figure of the distribution of symptoms across body location. This has now been removed from the text.

Page 17 line 50-54. ...associated with general unwell-being while at school and these responses tend to be sound specific. Here also other interpretations are possible like poor academic results etc that the authors should mention.

We think that this is not relevant in the preschool context. We think that the confusion has been created by the focus in introduction on intervention aspect of the study. This has been adapted in the introduction.

Did the focus group interview study involve the same group of children as the present paper? The focus group interviews were done on a separate sample and reported in detail in: Dellve L, Samuelsson L, Persson Waye K. Preschool children's experience and understanding of their soundscape. Qual Res Psychol 2013;10:1-13.

This is interesting and commendable work. The effects of the sound environment in preschools on young children needs to be investigated and improved.

Reviewer: Robert Moore Associate Professor and Chair University of South Alabama
United States

I have no competing interests with this manuscript.

Research question clearly defined - I would expect a clearer detailing of the research question than is contained in the first few pages of this manuscript.

I was unclear if the purpose was to validate a measurement (as suggested by the title) or to learn about the reaction of children to noise or both. The answer can be learned by reading the entire manuscript but should be clearer in the initial pages. We apologize for this confusion, and have now tried to clarify the purpose in the introduction

Methods - in my opinion some of the descriptions in the methods are somewhat superficial. For example, part of the methods describes pre- and post-testing noise measurements. It is written that "stationary measurements and personal dosimeters" were used. However, the instruments used are not described (manufacturer, type, etc.).

We fully understand that the methods seem superficial if it is seen as a paper reporting of an intervention. It is however important to stress that the article is aimed at describing and exploring the reliability and validity of the key questions of a structured interview developed for preschool children. The reporting of the results from the intervention study will be done elsewhere, and we agree that in such a paper it will be highly relevant to describe the source population, the study population, the study sites and the measurements in detail.

We have reduced the section of the noise measurements to make the aim of the paper more clear, however we have included the type of instruments used both for the stationary measurements and the dosimeters for context.(104-113)

Although not specifically stated, it appears that the dosimeters were worn by children ("children's dosimeter") there is no information concerning where on the body they were worn and how this was

monitored.

The same type of dosimeters were used for adults as for the children (Larsson and Davies SPARKS 705+) and mounted on the shoulder in accordance with guidance for occupational measurements. For the children we constructed a special vest with a pocket for the recorder. (104-113)

Finally, why was this pre- and post-testing measurement done?

The pre and post testing was done to evaluate the effects of the interventions that were made to improve the acoustics in the preschools. The reporting of these effects will be done elsewhere.

It appears that intervention had no effect on noise level.

The intervention had a slight effect as seen on the stationary sound level meters with the effect ranging from 1.2 - 3.8 dB LAeq. However no effects were seen on the personal dosimeters, probably due to the fact that the sound levels reaching the dosimeters comprise predominantly direct sounds. (109-112)

While pre- and post-testing results are reported, there is no discussion of this.

As it is not part of the focus of this paper we are only giving some results used to describe how the derived factors perform.

Also, in the methods on page 7 under the heading of "Coping strategies", it is written that visual representations were used. What visual representations? Figure 1? If Figure 1, how do those relate to "put your hands over your ears", etc.

Thank you for observing this, the sentence worded "again visual representation was used" is misleading and has now been rephrased. They were asked to state No or Yes and if Yes then they were asked how often they did this by pointing to one of the circles with one, two, three, four, or five dots representing almost never (one dot) to always (five dots). (139-142)

There are numerous typos in this manuscript. Check the usage of accept vs. except. Also, check the references for typos. I would suggest asking someone to proof read the manuscript before re-submission.

Thank you for pointing these typos out, we are sorry to say that in the final submission of manuscript the wrong version was submitted. The included version should be free of typos.

Reviewer: Charlotte Clark, Senior Lecturer in Environmental and Mental Health Epidemiology, Barts & the London School of Medicine, UK.

I think the sample is a little small to be able to adequately answer the research questions precisely and in detail.

We have taken the sample size into account in the analyses, and do also try and address these issues more clearly see row 180, 189-193

There are some small omissions about the participants, that can easily be addressed in a revision. I've outlined what I felt is missing in the author comments.

I'm unclear about how the sample was selected so am also unclear about how representative they might be. The sample comprised all 4-5 years boys and girls in the seven preschool where interventions were undertaken. We were dependent on parental approval and also approval of the single child at the time for the interview. The preschools included were the seven preschools where the municipality started to undertake renovations in order to improve the acoustics. Since then, over a

period of 5-6 years, all preschools of the municipality have been renovated. We estimate that the children are representative of low and middle class native Swedish families, the area comprised rather few immigrant families. The language issues are important questions to be resolved in further studies.

I would just say that I do feel the sample has limitations in being able to address the research questions in their entirety. I think that the paper would benefit from acknowledging this more clearly throughout.

We are aware of the limitations and have now also pointed that out more clearly and in the discussion row 339 and further.

The results are only able to partly answer the research questions in places, due to lack of power and also the limited number of items in the questionnaire available.

We have taken the sample size into account in the analyses, and do also try and address these issues more clearly see row 180, 189-193.

I don't foresee any ethical issues but there is no statement about ethnics in the paper.

The study was passed and approved by the ethics committee of Gothenburg, see row 81.

Little is known about the effects of noise exposure on pre-school children, making the development of measures to assess young children's reactions to noise an important methodological development, with lots of potential applications.

This is stressed in the objectives and limitations are, in agreement with the reviewer's opinion, clearly described

Background

This covers the relevant material. I think it might be worth giving a lay introduction to noise exposure in the first paragraph, explaining what LAeq means and perhaps including some context about what guidelines/legislation there is concerning pre-school noise exposure in Sweden, and perhaps more widely such as the WHO guidelines.

Given in the introduction row 10-11 and 15-19.

It would also aid the reader to include the ISO definition of annoyance in the introduction, where annoyance reactions in children are discussed.

We do not want to add this definition as we do not measure annoyance in a classical sense, but rather use wording children themselves used in focus groups re emotional and bodily reactions.

The objectives do not include any mention of the dosimeter part of the study.

We have included some descriptions of the context within which the interview protocol was used. In order not to lose focus from the validation, we have now only briefly described the intervention, the noise measurements and results.

Materials and Methods

In the description of the selection and recruitment it is not very clear how many children were from the intervention schools and how many were from the control schools. Could this be added to Table 1. I assume this was an opportunity sample, but it would be useful to say something about how the control schools were identified: were they matched to the intervention schools in any way? It would also help to speculate later in the paper how generalizable you think the findings of the study are, in view of the selection of the intervention and control schools.

All children described in the paper are from the intervention schools. We would speculate and say that the findings are rather generalizable, however the wording would need to be carefully translated to different languages to support that statement. In order to improve clarity of the paper we have decided to take out the control schools since they are not relevant for this paper. For your information; we selected the control schools from the same geographical area in order to keep the influence of socio demographic factors under control.

On page 5, I am not clear what is meant by the sentence 'Due to external circumstances no children were selected for the control group from preschools where no intervention took place'.

Idem see above

Procedure – did all the children wear dosimeters? If not, how were these children selected. Two children at a time wore the dosimeters. During the week the personnel tried to vary two children of the 4-6 yrs old children available who agreed to wear it.

Noise perception – I do have some concerns that the questions about noise perception are predominantly negative; e.g. hearing children being angry and yelling; shouting, screaming and banging. Would a child have answered yes, if they heard a child yelling or did it have to be both angry and yelling?

From the focus group interviews we know that there were also positive sounds mentioned at the preschools such as sounds from birds. They also mentioned familiar sounds described from the home environment, and unfamiliar sounds such as sounds from the radiator. We chose only sound categories that they disliked for the protocol as we were interested to know whether there would be a change due to the intervention. It would have been of interest to include positive sounds if we anticipated that the intervention would have enhanced such sounds, however there were no indication from the focus group interview that the positive sounds mentioned would be enhanced after the intervention.

It is difficult to answer if they would answer yes only for yelling, but as the question was phrased when a child is angry and yelling I would think that they mostly related to any yelling that they perceived as unpleasant. From the focus group interviews it was very clear that the children described such yelling as physically and emotionally painful.

Are the descriptions of the different items exact translations of the translation of the original materials? As far as we have been able to. We adopted professional translation and then had two people checking the English and translating back again. This was followed up by a discussion with the translator. However it is very difficult to get the exact tone between languages.

There may be some overlap of interpretation of events, as well as more simple noise perception but it may simply be a language issue. (see above)

There is a typo – load instead of loud. Wrong version/fix

Results – there are some typos – 'instable' instead of 'unstable'. Also 'unwell-being', needs to be reworded – perhaps 'low well-being'. Thank you for the suggestions we have changed in the text.

As the study summary suggests – more work on larger samples will need to be done to further develop a standard instrument in larger samples. This point needs to be made throughout the paper, as otherwise the low number of items and the low cronbach's alphas may be misunderstood by the reader. It is quite difficult to evaluate the reliability and validity of the scales, as an intervention has taken place. There is a lot of variation in the factor loadings etc using the before and after data. This could also be a result of the fairly small sample, but this data is not very convincing. The scales have

few items each, and within scales items often have low Cronbach's alphas – the change in alphas before and after are also worrying. My worry is that people may pick up this paper and use the scales as they are – this is encouraged at the end of the paper. My thoughts are that additional items are probably needed to increase the reliability of the scales.

Has been explained in more detail, and in this version we have restricted the emphasis on the before condition.

No limitations or strengths are given. There are indeed and refer mainly to sample size (see discussion)

Is there a danger that the dots rating scales draw the child to make a stronger answer? When you look at the scale, the larger 4 and 5 dot versions overshadow the other options. It might be worth trying an alternative scale in another sub-study to see if there is a methodological issue of this type, or not.

It is a relevant point, however we have looked at the data and there are no indications that there is a great use of the larger 4, 5 dots.

Reviewer: Goran Belojevic, Professor
Faculty of Medicine, University of Belgrade Serbia

I have no conflict of interest in this review.

One sample should be used in two different conditions.
That is what has been done, the difference between the samples are two children only.

Bodily reactions to noise should be omitted from this study.
We do not agree on this point. The added value of the focus groups and this study is that there are clear indications that children tend to express their reaction to noise in a somatic way especially young children.

The authors should omit the investigation of bodily reactions to noise as a research question!
(see above)

The authors have not proved that "the location of bodily reactions is a good and reliable way to measure reactions in young children"
We have extended the argumentation for this.

Page 4, row 16, Citation: "This paper explores and describes the reliability and validity of the key questions of a standardized interview protocol- the Inventory of Noise and Children's Health (INCH) - developed on the base of focus group interviews among 4-6 year old".

For a questionnaire to become "standardized" it needs to be tested for sensitivity and specificity on a much larger sample and rechecked in several independent studies.
We agree with this opinion and have rephrased the objectives. We are also describing this aspect in the limitations (see discussion).

Page 4, Row 52, Citation: "In total, 63 children and 59 parents filled out the questionnaire before and after the intervention. A control group of twenty three parents from three preschools where no interventions were undertaken was also included in the study. Parental data will be reported

elsewhere. Due to external circumstances no children were selected for the control group from preschools where no intervention took place”.

I think it is not needed in a “subjects and method” section what was not done in a study. So, please omit mentioning parents and a control group of children!

We agree that this was only confusing and have dropped the control schools.

Page 5, Row 19, I would not say that “as much as possible” in diminishing inter-rater variance is done by having two raters. The best way to do so would be to have only one rater for just 63 children, isn't it?

We have omitted the “as much as possible” as we agree that one rater would have been even better. To interview 63 children at two occasions take a considerably amount of time. The raters were trained and worked together initially to calibrate and minimise the variance as much as possible.

Page 6, Row 8, No need to mention measurements in control schools because these data are not relevant for this study.

Agreed and dropped

Page 7. Row 6. It is questionable whether a child aged 4-5 years could make a difference on a five graded scale. I would rather use just three dotted pictures, with one, three and five dots! Try testing for internal consistency using three graded scales which are simpler and more clear!

A check of tendency has been performed and revealed that the children do not tend to use the 4, 5 dots option more often.

Page 7. Row 12. Citation:“ The percentage of children who indicated that they never heard the sound was 17% and 19% for the yelling sounds...? "No yelling in a preschool!?"

These were the actual answers given by the children. Since it pertains to perception it is expected and desirable to see variation in responses. No action undertaken from our side.

Page 7, Row 21, If you asked a child about his/her feelings on noise why would you show his/her body on pictures. Face is relevant! Here again, the use of a five graded scale instead of a simple three graded one is questionable. I would say that for a child aged 4-5 years body reactions showed on pictures 1-3 would be all the same. It stands also for pictures 4-5. As for face reactions a child could hardly tell the difference in reactions between pictures 1-2 and 3-4. Try testing for internal consistency using three graded scales!

The reviewer raises an interesting question. Children from the age of 4-6 are in a transitional phase also referred to a “pre-schematic” when the body and more details start to be important in their own drawings. We asked the children during focus group discussions to draw themselves playing in the playroom and many paintings were more conventional (body, head, legs, arms) as opposed to focussing only on the head, legs and arm). In our analysis of the scale we see that they use the full scale, so at this stage we do not see the advantage of reducing it to a three grade scale.

Page 8, Row 5. Citation from the questionnaire: “Can you feel the sound inside you or in your body? And in what part of the body?” I would say that sounds are heard and not felt in some part of the body

As this is practically an unexplored area of research the protocol was developed based on the focus group interviews and the children's own wording. They described theirs sensations like this and we also see these types of sensations and descriptions among adults when it comes to low frequency noise and vibrations.

A 4-5 year-old child might have understood this question as: “If something hurts me now it is noise!”

See above, also a reference is given to the publication of the focus group interviews (Dellve L, Samuelsson L, Persson Waye K. Preschool children's experience and understanding of their soundscape. Qual Res Psychol 2013;10:1-13.

Page 8, First paragraph, Authors offer a small child to choose between his/her neck, arms, heart, belly, legs and feet where he/she "feels the sound inside". He/she may think: "Well, my feet ache me, it is because of children yelling!"

They indicate this on a picture and are not prompted to give an answer, this has been added to the text.

10. Page 10, Row 19. The number of interviewed children ranged from 4-15. A total of four children in an urban preschool?

Only children aged 4-6 yrs were asked to take part. The group of children mostly comprised range of ages from 1 to 6 years, meaning that some preschools had only 4 children aged 4-6 years.

Page 10. Table 1. If you compare the reactions to noise before and after an intervention you can do it only on the same sample of children in two different situations. Therefore, two dependent samples must not differ in the number of subjects, it is actually one sample with a total of 59 children with comparable data in two situations. The differences should be tested.

How can you explain that there was almost three times lower percentage of children with a highly angry reaction to noise after intervention, but more children who often cope and with at least one bodily reaction, compared to before intervention?

We have not drawn any conclusion about these low percentages, as we agree that the number of children having a score over 11 is low. There is no statistical inference included as the purpose of the paper is not to describe the outcome of the intervention.

What do ">11" and ">15" mean in Table 1?

See clarification below table 2. 201-202)

* percentage of percentage of children scoring in the highest two categories

** percentage of children scoring in the highest two categories per sum-score

Page 16, Row 41 Citation: "An important finding is that children compared to adults seem to have a tendency to describe reaction to noise in a somatic way: they literally feel the noise in their body, especially in the head, heart and tummy, with a prevalence varying between 15-20%". I would not say you proved this! I would rather say that children misunderstood the question? More precisely, this question would not be understood by adults either!

We have deleted the prevalence again as it takes away the focus from the paper. As stated above the origin of the questions are from the focus group interviews. We would argue that the way the children responded to the questions in the protocol supports this statement, however we also agree that further studies with a larger study sample is needed.

Conclusion: Omit "bodily reactions" from this study!

We do not feel that we can take away bodily reactions as they originate from how the children described their reactions.

Perform before and after analysis on one sample with comparable data for two different situations!

There does not seem to be a need for this, as the difference is only two children and as we are focussing on the before analyses

Typos

Page 2, Row 48, two full stops ok

Page 2, Row 55, "effect" replace with "affect" ok

Page 5, Row 45, "maths" replace with "mats" ok

Table 2. Last row. "f" replace with "g" ok

Page 16, Row 54, "where" replace with "while" ok

VERSION 2 – REVIEW

REVIEWER	Charlotte Clark Senior Lecturer Barts & the London, Queen Mary University of London United Kingdom
REVIEW RETURNED	11-Apr-2013

- The reviewer completed the checklist but made no further comments.

REVIEWER	Goran Belojevic, Professor Institute of Hygiene and Medical Ecology Faculty of Medicine, University of Belgrade Serbia I have no competing interests in this study.
REVIEW RETURNED	19-Mar-2013

THE STUDY	The sum of percentages by age in "after intervention" group (Table 1) is 89%?
GENERAL COMMENTS	I have changed my attitude toward children's bodily reactions to noise after reading your response. You have convinced me that this may be a promising research area,