Author's response to reviews

Title: Childhood psychiatric disorders as precursors of adult delinquency: A 30 years follow up study using official crime records.

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Author's response to reviews: see over
Dear Editor,

Thank you for the possibility to resubmit a revised version of the manuscript MS:1498013407475368 “Early identification of adult offenders in high risk child psychiatric in-patients: A 30 year follow up study using official crime records”.

We appreciate the reviewer’s comments, to which we respond in the following section. Two revised manuscript is attached, one with all alterations written in red and one with all alterations integrated.

Reviewer #2 (Comments to Author):

Comment 1 (Major compulsory revisions)

“Please provide more detailed information regarding the procedure for re-diagnosing based on hospital records, so readers are better able to assess its validity. This should include references to studies on the validity of file-based diagnosis in psychiatric research.”

Response 1

We agree that the information regarding the procedure for re-diagnosing based on hospital records was incomplete in the article. We certainly also agree that the article should include references to studies on the validity of file-based diagnosis in psychiatric research.

Revision 1

We have given a more comprehensive description of the diagnostic procedure in

1)“Measures” page 8, line 1-11:” Based on all the information in the hospital records, including weekly ward descriptions of the children, all the patients were re-diagnosed according to current criteria in ICD-10 [23]. The hospital records were comprehensive with extensive anamnestic information provided by parents, teachers and local health workers. All 541 patients were re-diagnosed by the first author and independently by at least one other experienced child psychiatrist. If the two raters disagreed, the case was discussed by a research group of four child psychiatrists, and a consensus diagnosis was established. It was found that 25% of the patients had more than one psychiatric ICD-10 diagnosis, with nonorganic enuresis or encopresis being the co-diagnosis most often encountered (59% of the cases). The diagnosis of greatest clinical importance (principal diagnosis) was pre-empted in this study. ”

2)”Measures”, page 8, line 15-16:” Hyperkinetic conduct disorder ((F90.1), the criteria for both hyperkinetic and conduct disorders must be met to achieve the diagnosis)”
3)”Measures”, page 8, line 17-18: Mixed disorder of conduct and emotions (F92), the criteria for both an emotional disorder and a conduct disorder must be met to achieve the diagnosis”

4)”Measures”, page 8, line 24 to page 9, line 2: “Z-group diagnoses, including diagnoses given for factors influencing health status and contact with health services. Investigations of problems within the family usually led to such a diagnosis. Descriptions of the child’s symptoms did not meet criteria for a psychiatric diagnosis.”

With regard to references about validity of file-based diagnoses, we did an extensive literature search, but we found only two articles of relevance. We have revised in “limitation”, page 19, line 1-2: “Inter-rater reliability was high, in line with previous research where validity of file-based diagnostic ratings has been found satisfactory (Grann et al., 1998, McKenzie K et al., 2011)”. These references are added in the reference list, number 41 and 42.

Comment 2 (Discretionary revisions)

“The authors might consider doing a statistical analysis looking for interactional effects between some of the major variables of interest (e.g. ADHD, CD, Family Disturbance).”

Response 2

We agree with the reviewer that statistical analyses for interactional effects between main variables of interest are relevant.

Revision 2

See revision 3, Reviewer # 1.

Comment 3 (Discretionary revisions)

“Although personality disorders and/or traits are not included in this study, it might be relevant to mention research on psychopathic (callous-unemotional) traits as another possible mediator between childhood CD and/or ADHD and later crime. Especially since Callous-Unemotional traits are considered as subtyping-candidates for CD in the upcoming DSM-V system (see e.g. McMahon, R. J., Witkiewitz, K., & Kotler, J. S. (2010). Predictive Validity of Callous–Unemotional Traits Measured in Early Adolescence With Respect to Multiple Antisocial Outcomes. Journal of Abnormal Psychology).”

Response 3

We agree that this is an interesting and important topic where recent research indicates that measuring CU traits could increase the predictive utility of later antisociality and criminality. However, in this study, diagnostic criteria according to ICD-10 were pre-empted, and CU traits were not measured. This topic was therefore not discussed in the article.

If the reviewer disagrees, we will, of course, reconsider our decision.

Reviewer #1(Comments to Author):

Comment 1 (Major essential revisions)

“Please provide substantial more data to give us an understanding of the process of giving a diagnosis based on the file review. For instance, what types of information was considered critical for each diagnosis? What kinds of information were used to exclude a diagnosis?”
Response 1

We agree that the description of the diagnostic process in the paper was incomplete. Over the period the patients were hospitalized, International Classification of Diseases (ICD) 7 to 9 where the official classification systems for psychiatric disorders in Norway. These classification systems were not always systematically used at NCCAP. Based on all the information given in the hospital records, all the patients therefore had to be re-diagnosed according to current inclusion and exclusion criteria in ICD-10. The hospital records were comprehensive with extensive anamnestic information provided by parents, teachers and local health workers, and the inter-rater reliability was high.

Revision 1

See revision 1, reviewer #2.

Comment 2 (Major essential revisions)

“The single diagnosis that is best described, mental retardation, could benefit from having some examples given for types of tests, and whether other information was available, such as details of school performance.”

Response 2

Standardized IQ— instruments were not systematically used during the study period, and the assessment of each participant’s intellectual level was based on all the information available in the hospital records, including clinical findings, adaptive behaviour and psychometric test performance during hospitalization. All children of school age were admitted to the affiliated school were the teachers performed systematic pedagogical evaluations. The hospital records were of good quality, giving a detailed and thorough description of the patients’ pedagogic skills. An inter-rater reliability study for cognitive level was conducted, and is added to the inter-rater reliability study in the revised paper.

Revision 2

We have revised in
1) “Measures”, page 9, line 12-17: “An assessment of each participant’s cognitive level was based on all the information available in the hospital records, including clinical findings, psychometric test results (in some cases standardized intelligence tests, e.g. Wechsler Intelligence Scale for Children (WISC), Standford-Binet Intelligence Scales, Leiter International Performance Scale) and pedagogic tests (e.g. Illinois Test of Psycholinguistic Abilities (ITPA), Peabody Picture Vocabulary Test) during hospitalization. For children of school age, systematic pedagogical evaluations were performed by teachers at NCCAP’s affiliated school.”
2)”Inter-rater reliability study”, page 10, line 9-10: “and intraclass correlation coefficients (ICC) of 0.83 for CGAS, 0.86 for CFD and 0.85 for cognitive level.”

Comment 3 (Major essential revisions)

“The authors have chosen to give diagnoses as mutually exclusive categories. For conduct disorder and ADHD/hyperkinetic disorder, this may give face value because it relates to the question of an
interaction between the two. However, it does give some curious results, such as when the authors
analyze the impact of having mental retardation only, controlling for mental retardation. It would be
more informative if the authors made 7 different dummy-coded variables, one for each diagnosis
into the regression analysis. In a second step, interactions between variables of interest could be
included (e.g., ADHD and conduct disorder, which may or may not interact). The exploratory nature
of forward stepwise regression means that it should not be used for a study that is hypothesis
testing, such as this. Forward stepwise, as well as backwise, capitalizes heavily on chance, and
produces wrong coefficients, standard errors, and estimates of overall prediction (see
http://www.stata.com/support/faqs/stat/stepwise.html, for number of pertinent points, with
numerous references). In contrast with stepwise regression, forcing an interaction into the model
after first assessing the model without the interaction, does not have these associated problems. If
this second step was significant, it would indicate that the authors found that the evidence from
their study supported that it is the combination of CD and ADHD that sets individuals at risk for
crime. If not, they would reject it in their sample. This would add an important point to their
discussion.”

Response 3

This is an important comment made by the reviewer. We agree that direct Cox regression analyses,
where all relevant variables are entered into the analyses in one step, is the method of choice. We
had no specific hypothesis about the order or importance of the predictor variables which is the
explanatory nature of forward stepwise regression analyses.

Revision 3

We have redone the regression analyses as suggested by the reviewer. Main vulnerability factors
remained the same using the direct Cox regression analyses, but with minor absolute value changes:
“Conduct disorder (RR=2.00, 95%CI= 1.18-3.37), hyperkinetic conduct disorder (RR=2.66, 95%
CI=1.60-4.43), pervasive developmental disorder (RR=0.38, 95%CI=0.17-0.87), mental retardation
(RR= 0.44, 95%CI= 0.25-0.78), male gender (RR=3.61, 95%CI=2.14-6.07) and chronic family difficulties
(RR= 1.26, 95% CI= 1.07-1.47)” . These results were changed in “ Abstract” page 2, line 14-
19/ “Results” page 12, line 12-17/ “Table 2”, page 25-26. We have omitted “forward stepwise” in
“Abstract” page 2, line 12, and in “Statistical methods”, page 10, line 20.

Because the diagnoses in this study is mutually exclusive categories, diagnostic dummy variables
were made in the first place. We totally agree that the analysis of mental retardation only (MRO)
controlling for mental retardation (MR) make little sense, because of the overlapping construct. The
MRO variable is therefore not included in the final regression model and is revised in “Results”, page
12, line 9-11: “All but one of the eight associated factors were entered into a Cox regression.
Because the MRO variable represented overlapping constructs with the overall MR variable, it was
not included in the equation.”

Because of the small sample being convicted, and because of small cells, we chose to include only
those univariate variables significant at the 5 % level into the multivariate model. However, the
ADHD variable was exploratory forced into the model, because of the importance of this variable.
This did not change the final results. We revised in “Results”, page 12, line 22-23: “We also forced
the ADHD variable into the final model. The results of main vulnerability factors did not change (data
not shown). “

We have run exploratory analyses where interactions between variables of interest were extensively
investigated (eg. chronic family difficulties *diagnosis, gender*diagnosis, gender* chronic family
difficulties, cognitive level*diagnosis). We found no significant interactions of interest. When
potentially interactions were forced into the model one by one, the final results remained the same.
We have made following revision in “Results”, page 12, line 19-21: “We found no evidence for interactions. We specifically explored the possible interaction between cognitive level and ADHD, and between CD and chronic family difficulties. We found no evidence for this (data not shown).”

Considering the potential interaction of ADHD and conduct disorder, we found that both conduct disorder alone (OR 2.00, p=0.01) and combined with ADHD (OR 2.66, p≤0.001) represented independent high risks for later convictions in the final model (Table 2, page 25) (this was regardless of the ADHD variable being forced into the model). With regard to RR, it seems like having ADHD in addition to conduct disorder, added only little to the prediction of criminality, and we considered this difference being too small to make a point out of it in the discussion.

We also repeated sub-grouping analyses, and all the results remained similar. However, worth mentioning, when we repeated analyses where those with severe mental retardation were excluded, the strength of mental retardation turned out to remain protective. We therefore revised the text in 1) “Results”, page13, line 2-5: “We also ran analyses where sub-grouping of mental retardation was more fine-meshed, and where those with severe mental retardation (n=73) were excluded, without changing the results of main vulnerability factors. “ 2)“Discussion”, page 18 line 5-8: “ Worth mentioning, when those individuals with severe mental retardation were excluded from the material, mental retardation still remained protective, which means that having a mild mental retardation as a protective factor was also added in “Abstract, page2, line 16-17:“and mental retardation (RR= 0.44, 95%CI= 0.25-0.78) reduced the risk for a criminal act.”

Comment 4 (Discretionary revisions)

“Please give a reference to the ICD-10.”

Revision 4

A reference to ICD-10 is added in “Measures”, page 8, line 3, and added in the reference list, number 23.

Comment 5 (Discretionary revisions)

“Please provide one or more references to the validity of the use of file-based diagnoses (I could think of one: Journal of Personality Assessment, 70(3), 1998, 416-426, Grann and colleagues, but there must be more than that out there). “

Response 5

See Response 1, Reviewer #2.

Revision 5

See Revision 1, Reviewer #2.

Comment 6 (Discretionary revisions)

“Personally, I would also like to see if entering a CD*family disturbance interaction had anything interesting to say. Should the authors choose I suggest that each interaction is entered separately,
because if multiple interactions with the same variable are entered in several interactions, it is likely to cause spurious associations and cloud the overall impact of that variable taken alone.”

Response 6

We agree that each interaction should be entered separately.

Revision 6

Interactions of interest were forced into the model one by one, and the final results remained the same. We found no evidence for interaction between CD and chronic family difficulties. We revised in “Results”, page 12, line 19-21: “We found no evidence for interactions. We specifically explored the possible interaction between cognitive level and ADHD, and between CD and chronic family difficulties. We found no evidence for this (data not shown).” (See also revision 3.)

Because the discussion concerning chronic family difficulties and conduct disorder was unclear, we revised in “Discussion”, page 17, line 14-21: “Recently, D’Onofrio 2009 et al. [39] even claimed that there is a causal association between family income and childhood conduct problems, and emphasized the importance of identifying family income as a crucial risk factor for development of early CD. In our study, high CFD scores were highly prevalent among all the children with conduct disorders (Table 1), and about half of these children turned out to be delinquent. The present finding highlights the importance of early intervention among children with severe family difficulties to avoid development of early CD, which is highly associated with further criminality.”

As recommended, we have revised the title from” Early identification of adult offenders in high risk child psychiatric in- patients: A 30 year follow up study using official crime records” to “Childhood psychiatric disorders as precursors of adult delinquency: A 30 years follow up study using official crime records”.

We have copy edited the revised manuscript without correction marks.

Hopefully, these responses clarified your comments. If something still is unclear, we will be grateful to elaborate or revise further in the text.

Yours Sincerely,

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