**Response to the reviewer’s comments**

Dear Reviewer,

We are grateful for your comments and are hereby responding to you:

**Reviewer Comments**(Please note that your submission was reviewed by at least three reviewers and an SPC member. Numbers 1, 2, 3., etc. below represent different reviewers):1: The paper presents a convoluted deep learning based approach for automated segmentation of e-Coaching MI sessions. The methods used are well-explained. However, the paper lacks organization and not coherent. The introduction could focus on the big picture of MI segmentation and how the proposed methods can address the current limitations. The paper does not mention why the genY eating dataset was chosen and how the data is structured. Given that annotation is laborious and time-consuming, information on how the data was annotated and a snippet of data would better explain the underlying dataset. For the same reason, an investigation of the number of instances of label data required for accurately predicting the new/same segment could improve the proposed method.

*Response: The abstract was re-written to eliminate the confusion about manual coding. All references to "manual coding" have been removed from the revised manuscript.*

F1-measure, precision and recall are good metrics for evaluating imbalanced datasets. However, AUC is agnostic to class imbalance and quite similar to accuracy. For these reasons, we see a very high AUC value (all over 0.9) for all classifiers and features combination. AUPR should be used instead (both as precision-recall curves as well as AUPR values) as it takes the class imbalance into account and helps to identify the power of the classifier in correctly labelling the minority class. The paper does not mention how many iterations for each fold and how many 5-fold sets for cross-validation were conducted.

*Response: This sentence was edited to more clearly explain that variation by “treatment context” was observed. An additional sentence was also added, as suggested: "The current study contributes to existing knowledge by examining African American adolescents in weight loss treatment."*

2: Good idea to use deep learning for text segmentation. You mentioned that a limitation of this study is that data is collected from a single medical institute but formatting, style and email segment can be different in other settings. It could be better to describe how different these data are.

*Response: T**he revised manuscript addressed this issue in the section 2.3.2 for Frequent Pattern Mining.*

3: Summary: Applying prior algorithms using NLP features to segment e-mail based behavioral interventions.

*Response: We observed 4,724 state transitions in the successful sequences, where 4,679 and 45 state transitions occurred between different and same states, respectively. In contrast, 1,106 state transitions occurred within the unsuccessful sequences, where 697 and 409 state transitions happened between different and same states, respectively. On an average, 5 state transitions occurred within a sequence for both successful and unsuccessful sequences. The revised manuscript included this information in the results section.*1) The classification problem of a new segment or not in the email is identifying a rare event (a new segment start), amongst many existing segment words. The authors classify on each individual word and punctuation. It appears that the algorithm could potentially be splitting up segments by sentences where it could classify many correctly and only a few wrong (multi-sentence segments). A further discussion on the number of multi-sentences and how easily those are detected would speak to this. Further, if it is the case that it tends to identify single sentence segments well, then maybe consider splitting the text into sentences and classify on each sentence instead of words. Also a minor detail, how does the algorithm start automatically: with a 0 at the first word?

*Response: In the discussion section, the statement containing the phrase “next phase” was revised to clearly explain our current work after considering the reviewer’s suggestion.*

2) In the comparison of algorithms (table 1 and 2), it appears that MLP has the best precision. A discussion on why this might be the case would provide more context for the algorithms chosen. Further, table 3 with the AUC values, for BRNN and CRNN, the POS tags lowered the AUC. A discussion on this would provide more context as well.

*Response: In addition to the above modifications, we also carefully revised our manuscript and fixed any issues related to spelling and grammatical mistakes.*3) In terms of evaluation, the standard method is to compare the IAA to the F1-Measure. A discussion on the IAA and how it compares would provide an idea of how hard the problem is. The F1-measure is already quite high as well.

*Response: In addition to the above modifications, we also carefully revised our manuscript and fixed any issues related to spelling and grammatical mistakes.*

4: This paper reports a comparison study to evaluate the empirical effectiveness of deep learning architectures in addressing the problem of discourse segmentation in the context of e-mail based behavioral interventions. The main contribution of this paper makes to the AMIA community is insights on discovering unstructured text data in the emails for communication and intervention, which can enrich the available data for further discoveries. This contribution is applicable in real-world as there exists huge amount of unstructure data besides EHR.

*Response: In addition to the above modifications, we also carefully revised our manuscript and fixed any issues related to spelling and grammatical mistakes.*

Suitability for AMIA: The paper is well written with key points made easy to find through clear pipeline illustration. The work is a good fit for the AMIA audience particularly for attendees interested in deep learning, NLP real-world application.Context for work: There are multiple points that the authors need to address, the data needs to be described more clearly, a summary table would be great. The font for the captions of figures need modification, Fig.3 pipeline is not clear enough.

*Response: In addition to the above modifications, we also carefully revised our manuscript and fixed any issues related to spelling and grammatical mistakes.*Suitability of methods: The methods are clear, thoroughly described, and well-matched to answer the stated research questions, especially it is robust to unbalanced data. The detailed implementation of the methodology is good for reproduce. Considering deep learning is mostly used as a black-box, the interpretation of it on the medical application is not that clear.

*Response: In addition to the above modifications, we also carefully revised our manuscript and fixed any issues related to spelling and grammatical mistakes.*Analysis and importance of results: Although the analysis involved complex steps, readers without a technical background should find this paper quite accessible because of the authors’ clarity. The author successfully convey that CRNN is the better one for the problem they are investigating, however, as the author mentioned, the generalization of the remains unclear and the fields which require the technique are narrow. In all, this can be a good work considering the clear pipeline and clear statement of the evaluation.

*Response: In addition to the above modifications, we also carefully revised our manuscript and fixed any issues related to spelling and grammatical mistakes.*