**Responses to the reviewers’ comments**

Dear Reviewer,

We are grateful for your comments and are hereby responding to each one of you individually:

**Reviewer #1:** Thank you for your suggestion to evaluate the usefulness of the proposed approach and its limitations based on a real-life implementation. This paper is just one of many papers that came out from our collaboration with MI practitioners. We agree that evaluation of the usefulness of the proposed approaches in a clinical setting is a very important topic, which deserves a separate publication. In fact, our collaborators will be working on this in later stages of our multi-year project and their findings will be distributed in a forthcoming journal publication.

**Reviewer #2:** Thank you for your suggestion. We added the following parts to the revised paper:

1. The first point in the “Discussion” section explains the advantages of RNN over probabilistic models.
2. We added a paragraph to the “Recurrent Neural Network” section to explain RNNs with target replication.
3. We made a thorough proof-reading pass over the entire paper and fixed all the spelling and grammatical errors.
4. We defined the “PPC” abbreviation in the introduction.

**Reviewer #3:** Thank you for your feedback. We have added more details about how embeddings were obtained (dense low-dimensional code embeddings were obtained as a by-product of training LSTM and GRU in Tensorflow, one-hot representations of behavior codes were used as input). Indeed, although the proposed model was applied to the analysis of motivational interviews, it can be used for multi-class classification of discreet observation sequences of any kind.

**Reviewer #4:** The MYSCOPE is an adaptation of an existing MI code scheme (codebook), the Sequential Code for Observing Process Exchanges (SCOPE) [1]. The original SCOPE was adapted to include culturally relevant examples of CHT and CML specific to black adolescents with obesity and caregivers; examples of CHT and CML for the pertinent target behaviors (weight loss, healthy nutritional changes, increased physical activity); and new codes for provider communication behaviors that had not been included in existing coding schemes (e.g., emphasizing autonomy, eliciting feedback). The result of this work was the Minority Youth Sequential Coding for Observing Process Exchanges (MY-SCOPE). Usually, word2vec embeddings are utilized for textual data, when each observation is a word. In this study, each observation is a behavior code. RNN architectures typically use one-hot vectors as input. In our case, code embeddings are obtained as part of training the proposed RNN architecture to address the target problem of sequence classification, while word2vec embeddings are trained to ensure that observations frequently co-occurring within a fixed-size contextual window have similar embeddings.

**Reviewer #5:** Thank you for introducing TRIPOD to us. We went through the guidelines of the TRIPOD statement and checked all points. We provided the exact definition of the outcome variables in the “data collection” section.

[1] Martin T, Moyers TB, Houck J, et al. Motivational Interviewing Sequential Code for Observing Process Exchanges (MI-SCOPE) Coder’s Manual. Albuquerque, NM: University of New Mexico, Center on Alcoholism, Substance Abuse, and Addictions (CASAA); 2005.