

RELIABILITY INTER-EXAMINERS OF THE NORDOFF ROBBINS MUSICAL COMMUNICATIVENESS SCALE BRAZILIAN VERSION

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ABSTRACT

The Musical Communicativeness Scale is used to evaluate behaviors from sound and musical stimuli since the decade of 1960 in the USA. To be used also in Brazil, a validation process is required where Cultural and linguistic issues can be evaluated in the Brazilian context. For this validation process the model by Herdman, Fox-Rushby and Badia (1998) has been chosen. This model provides 6 equivalence types: conceptual, item, semantic, operational, measurement and functional. In this study the equivalence measurements has been chosen for testing reliability inter-examiners of the Musical Communicativeness Scale. The analysis of 24 music therapy methodological videos was adopted for boardline cases' people with neurodevelopmental disorders through Musical Communicativeness Scale. 1 researcher and 4 invited examiners have participated in this study stage. The inter-examiner scores have presented moderate and strong correlations (Spearman), indicating evidences of reliability for the Musical Communicativeness Scale translated and adapted to the Brazilian context.

1. INTRODUCTION

In Brazil as well as worldwide, there is a necessity for tests in order to evaluate behaviors resulting from sound and musical stimuli. Nordoff, Robbins, and Marcus (2007) state that three Scales were developed from research conducted at the University of Pennsylvania in the 1960s to analyze behaviors from musical stimuli in music therapy sessions. Among these three scales, also called Nordoff Robbins Scales, there is the Musical Communicativeness Scale. The Musical Communicativeness Scale evaluates in seven observable stages the levels of musical communicability through three variable strains: vocalizations, manipulation of musical instruments and movements with the body.

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According to Nordoff, Robbins and Marcus (2007), essentially this scale is interrelated with the possibility of involving any individual in a process of awakening to musical awareness, to their perception and their pleasures, and to the experiences of communication, personal freedom, and accomplishment that the process can ensue. The musical scale also convey the stimulating impact of music, the interest musical co-activity that can be held, the releasing and uplifting enthusiasm that can be generated, and the communicative motivation that can be released. The Musical Communicativeness Scale is accomplished through three different activities: Instrumental, Vocal and Body Movement. The response of a child can arise in all three activities or in a single or two, as well as the emphasis of the reaction can be transferred to the following activity. In order to research the general means of communication associated to therapeutic activity, the scale define the successive communicativeness levels of behaviorism of each arrangement likewise they are shown in a evaluative form in such way that the developed communication activity similarly the manners remain at the same level. Yet, according to Nordoff, Robbins and Marcus (2007), the levels (1) to (4) describe the stages of activation and the differentiations of consciousness that lead to the beginning of musically intentional response — the gradual drawing out of a non-communicating child from evoked responses toward the achievement of limited communicative activity. The levels (1) to (4) can be seen as “stepping in and stepping down”, which delineate the stages in a developmental process of awakening awareness as well the response to the therapists' music and their own emerging capability. Children responding on level (4) will already have, or be developing in therapy, the beginnings of a functional basis for musical participation. Levels (4) to (7) describe the stages of widening communication and personal-musical maturation that result from progressive musical engagement. These levels rate intensification of activity and advances in flexibility, quality, and breadth and strength of receptiveness and expression. These activities are manifested as a child's musical intelligence unfolds developmentally and they are progressively liberated from an emotional and/or organic dysfunction to become freely communicative and communicable.

The levels (1) to (4) examine the gradually deepening entry into a process of awakening musical awareness, and into finding and developing the receptive and expressive skills that stimulate and serve the realization of musical communicativeness. On Level (4) the beginning of an integrative grounding is taking place from which more capable and outwardly directed levels of interpersonal musical communicativeness become possible. As the response moves into Level (5) children are attaining some independence of selfhood in music as they become communicative. Level (6) co-activity and interactivity consolidates and enlivens these experiences and capabilities. Level (7) accommodates the activities of musically released, enthusiastic, and often creative of the individual. Consequently, Levels (4) to (7) can be thought of as "stepping up and stepping out."

In order for the Musical Communicativeness Scale to be used in the Brazilian context, a validation process is necessary. This process is extremely necessary for health tests in order to observe the best assurance to express each original construct and so cultural differences that can be evaluated for the new context of using. In order to carry out this process, the Universalist Validation Model developed by Herdman and colleagues (1998) was chosen to validate health tests. This model is divided into 6 (six) steps: conceptual equivalence, item equivalence, semantic equivalence, operational equivalence, measurement equivalence and functional equivalence. It is noteworthy that André, Gomes and Loureiro (2016) applied the model of Herdman et al. (1998) in order to investigate the conceptual equivalence of the Musical Communicativeness Scale. It was verified that the publications concerning to the use of the Scale increased over the years and that was used to evaluate the following populations in their original context: Autism Spectrum Disorder (ASD), described by the authors Bergmann (2015), Bell et al. (2014), Bergmann et al. (2006), which is a study of the development of neurodevelopmental disorders (Aigen et al., 1995) and the use of neurotransmitters and Mahoney (2010), healthy people, as described by the authors Australia (2008), Bunt (2003), Rahman (2008) and Wood (2006) and people with anorexia nervosa, described in Roberts's study (2000).

Subsequently, André et al. (2016) conducted a study of item equivalence, semantic equivalence and operational equivalence of the Musical Communicativeness Scale. In this process, the Musical Communicability Scale and its manual explaining English to Portuguese were translated. After the translation, the re-translation was performed for English and analysis of the translations. Specifically, four translators were invited to elaborate the Brazilian Portuguese version of the explanatory manual and the Musical Communicativeness Scale. In addition, 10 judges were invited to analyze the translated version of the explanatory manual and the Musical Communicability Scale by means of a questionnaire. All these steps presented favorable evidences to the equivalences of items, semantics and operational of the Brazilian version of the Scale of Musical Communicativeness.

The explanatory manual of the Musical Communicativeness Scale defines how the levels and domains of the Scale should be punctuated in the evaluation of the behaviors observed in a music therapy session. After verifying the explanatory manual of the Musical Communica-

tiveness Scale presented by André et al. (2016), some adaptations through a summary of the translated manual were made. This summary did not interfere in the general sense of the Scale, but aimed to systematize its instructions. In the short version of the Handbook of Musical Communicativeness Scale, descriptions of Scale domains, items and grades were maintained, secondary information was written more objectively, and only one type of score was chosen for the Musical Communicativeness Scale. The original manual allows different types of scores. Only one of the punctuation options described in the Handbook of Musical Communicativeness Scale for the summarized manual has been used. This score is called "score by checklist," where only one item from each domain is punctuated at a time. Additional information on the summary process of the Scale manual will be described later.

In this study, the measurement equivalence of the Musical Communicativeness Scale was verified, translated and adapted to the Brazilian context as well as investigated the inter-rater reliability of this equivalence. The objective of the study was to verify the inter-rater reliability of the Musical Communicativeness Scale for the evaluation of music therapy interventions in children and adolescents with neurodevelopmental disorders.

2. METHODOLOGY

2.1. Participants

In this study, five examiners participated, among them, four were invited and one examiner was the researcher of this study. All four invited examiners are female, aged 20-25 and undergraduate students in music therapy.

In addition, two patients participated in the videos. One of them was five-year-old individual in the recording period of the videos who was diagnosed with Autism Spectrum Disorder while the other patient was 14-year-old individual during the video recording period who was diagnosed with tuberous sclerosis.

2.2. Instruments

After analyzing the translated manual of the Scale of Musical Communicability without any adaptation presented by André et al. (2016), a summary of this manual was made in order to allow greater understanding and a better targeting of data collection in this study.

All the explanations referring to all degrees, items and domains of the Scale of Musical Communicativeness were kept in the manual. Any observation considered as secondary information was discharged. This secondary information was descriptions of clinical examples from audio analysis, descriptions of modes of activities present in a music therapy session, and descriptions of different forms of Scale scores. Subsequently, the modes of activities present in the music therapy session in a more succinct way, and presented as examples of analysis and punctuation from videos of music therapy sessions were written. After excluding the other punctuation modes present in the translated manual of the Musical Communicativeness Scale, only a single way of punctuating the

Scale called “punctuation by checklist” was kept, where it allows that each domain be punctuated in a single time per analysis.

The Musical Communicativeness Scale is divided into 7 grades and 3 domains. The 7 grades assess the levels of musical communicability in 3 modes of activities: vocalizations, manipulation of musical instruments and movements with the body. The scale also allows punctuation for total patient inactivity and the sum of all modes of activity in order to verify the patient's musical communication more comprehensively.

In addition to the brief manual and the Musical Communicability Scale, 24 pre-recorded videos of Music Therapy consultations performed for people with neurodevelopmental disorders at the HC-UFGM Children's Psychiatry Outpatient Clinic and ABET (Brazilian Association of Tuberous Sclerosis) were used.

2.3. Data collected

Data from pre-filmed videos of music therapy sessions performed for people with neurodevelopmental disorders were selected and collected. Those responsible for the videos signed a Term of Free and Informed Consent authorizing the use of the same in this research. After being selected, the videos were edited in 240 time units of 30 seconds. From the 240 temporal units, a random draw of 24 stretches was carried out. After these steps, four examiners were duly trained by reading the summarized manual and were invited to hold a meeting with the researcher to clarify possible questions. Every participant has received a material for analysis and was instructed not to share information about their evaluation of the 24 videos from the Musical Communicativeness Scale. The examiners were then asked about their opinion on the understanding of the abridged version of the handbook on the Scale of Musical Communicability as part of the evaluation of the results.

This study was carried out for the Postgraduate Program in Music of the Federal University of Minas Gerais, in the area of Sonology. The same was approved and registered in the Ethics and Research Committee of UFGM, number 54578315.5.0000.5149

2.4. Data analysis

The pre-recorded videos of music therapy consultations accomplished with people suffering from neurodevelopmental disorders were analyzed from the Musical Communicability Scale. These videos were divided by 30 second units, which allowed an analysis of behaviors that occurred during each part of the music therapy sessions.

All data were stored in the Microsoft Excel 2016 spreadsheet. The Spearman correlation index was calculated to verify the inter-rater reliability of the Musical Communicability Scale. The correlation test was performed in SPSS 20.0 software, presented by Dancey and Reidy (2013).

3. RESULTS

In the field of the Musical Communicativeness Scale referring to instrumental musical communication, the mean value of the correlations was $\rho = 0.79$ and the standard deviation 0.08.

In the field of the Musical Communicativeness Scale referring to vocal musical communication, the mean value of the correlations was $\rho = 0.87$ and the standard deviation thereof was 0.06.

In the field of Musical Communicativeness Scale referring to musical communication through movements with the body, the mean value of the correlations was $\rho = 0.68$ and the standard deviation 0.19.

In addition to the individual domains of vocal, instrumental and body movement communication, the Musical Communicativeness Scale also predicts the sum of these domains in order to evaluate the patient's general musical communication. When performing the Spearman correlation test for the Total Musical Communicativeness score, it was observed that the mean value of these correlations was $\rho = 0.73$ and the standard deviation 0.06.

Moreover to the correlations among examiners, the correlation of examiner 1 (the researcher of this study) was carried out with the other examiners (collaborators). Altogether, the number of analyzes of the examiner 1 was replicated in order to compare with the 24 analyzes of each collaborating examiner. In this case, the Spearman correlation was performed with 96 analyzes (24x4).

After performing the Spearman correlation test between examiner 1 and other examiners, it was observed a moderate correlation in the body movement domain ($\rho = 0.69$) and strong correlations in the vocal domains ($\rho = 0.87$), body movement ($\rho = 0,81$) and in total ($\rho = 0.98$).

In a preliminary study by André et al. (2016), a questionnaire was prepared for judges to classify the semantics and degree of comprehension of the translated manual of the Musical Communicativeness Scale. In this preliminary study, 60% of the judges rated the handbook as fully comprehensible and 40% rated it as partially comprehensible. According to the judges who classified the translated manual as partially comprehensible, it could be more objective and organized in a way that yields more fluency to reading. In this study, the collaborating examiners were asked about the comprehension of the summary manual of the Musical Communicativeness Scale in relation to the video analysis and in relation to the translated manual of the Scale. The whole panel of examiners rated the summarized manual as fully comprehensible and objective.

4. DISCUSSION

Hitherto, it can be acquired that Musical Communicativeness Scale has presented, in most analyzes, strong correlations, which indicates good inter-rater reliability. This information can be reinforced by the fact that there

is no weak correlation in this study. These results indicate that the summary manual was indeed understandable, as the examiners stated and that they were able to understand the explanations as expected. It is also observed that according to the examiners, the summary version of the explanatory handbook of the Musical Communicativeness Scale presented better understanding than the translated explanatory manual.

The correlations made in this study that the whole panel of examiners presented similar scores to the researcher were disrupted from examiner 3 who differ from all other examiners, including the researcher, in the analysis of the domain of musical communication of corporal movement. As this difference occurred with examiner 3 only, and in a single domain, it is possible to consider this as an acceptable result because, even with some differences, the correlations were still moderate. In the others domains, examiner 3 presented strong correlations with the other examiners, including the researcher's correlations.

The Musical Communicativeness Scale has been used in Brazil in research to evaluate the behavior of children with ASD in music therapy sessions, as stated by Freire (2014), Andre e Batista (2014) and Sampaio (2015). Andre and Batista (2014) even performed the inter-rater reliability of the Nordoff Robbins Scales in this population. Nevertheless, overall the evaluation of children with ASD, the Musical Communicativeness Scale can also be used in a broader scope, for evaluating children and adolescents with neurodevelopmental disorder. According to the Diagnostic and Statistical Manual of Mental Disorders (DSM - 5), neurodevelopmental disorder can be defined as:

"... It is a set of conditions which begins in the developmental period. Disorders typically manifest early in development. In general, before children start attending school, they are characterized by deficits in development that lead to impairments in personal, social, academic or professional functioning" (AMERICAN PSYCHIATRIC ASSOCIATION, 2014).

The validation of the Musical Communicativeness Scale for the Brazilian context may contribute to several researches and to the clinical context. By using the same evaluation for assessing people with neurodevelopmental disorders may help in several contexts, since several music therapy interventions have been carried out for the Brazilian population, according to Loureiro (2006) and André et al. (2015).

Furthermore, the Musical Communicativeness Scale could also be used to evaluate behaviors in other populations, such as healthy people, as described by Australia (2008), Bunt (2003), Rahman (2008) and Wood (2006). Alternatively, in order to have these techniques being applied in Brazil, more research needs to be done. According to the Universalist Validation Model presented by Herdman and colleagues (1998), it is necessary 6 steps for the Musical Communicativeness Scale to be validated in the Brazilian context. Out of these 6 steps, 4 steps have already been accomplished. They were: conceptual equivalence, carried out by André, Gomes and Loureiro,

(2016) through the study of bibliographic revision and the equivalences of items, semantic and operational carried out by André et al. (2016). In the present manuscript, the equivalence of measurement through inter-rater reliability of the Musical Communicativeness Scale was verified.

5. CONCLUSIONS

The validation of the Musical Communicativeness Scale for the Brazilian context may contribute in the future to the clinical and research context which has been used since the 1960s. For this validation process to occur, studies have already been carried out by André, Gomes and Loureiro (2016) and André et al. (2016) to verify the conceptual, item, semantic and operational equivalence of the Musical Communicativeness Scale.

In this study, the equivalence of measurement through inter-rater reliability of the Musical Communicativeness Scale was carried out. It was observed from the Spearman test, moderate and strong correlations. By same means, it was found a moderate correlation in the body movement domain ($\rho = 0.68$) and strong correlations in the instrumental ($\rho = 0.79$), vocal ($\rho = 0.87$) and total musical $\rho = 0.73$). According to collaborating examiners, the summary manual is fully understandable and the Musical Communicativeness Scale could contribute to the Brazilian context. Further studies can be carried out to validate the Musical Communicativeness Scale in the Brazilian context.

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