VOL I

Ciências Humanas:

Estudos Para Uma Visão Holística Da Sociedade

Silvia Inés Del Valle Navarro
Gustavo Adolfo Juarez
(Organizadores)

2021

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APRESENTAÇÃO

ESTUDIOS CULTURALES Y DESARROLLO HUMANO

“Só quem pode surgir com o povo é o novo.
E o novo são as crianças.
Com elas, poderão vir as respostas que não encontramos” ...

“...Poxa, até que essa geração mais velha tem algo a oferecer”

Ubiratan D´Ambrosio
São Paulo, 8 de Diciembre de 1932 - 12 de Mayo de 2021

Este libro, titulado **Ciências Humanas: Estudos para uma Visão Holística da Sociedade**, surge mientras transitamos un momento muy particular para nuestra especie humana, en donde se ve amenazada su existencia en forma global. Es por ello, que debe valorarse el esfuerzo de numerosos autores e investigadores que todavía sienten la necesidad y el deseo de entregar sus esfuerzos en la causa de la difusión de resultados de sus trabajos científicos.

Mientras esperamos soluciones, que resguarden al bienestar en la Salud y con ello en la recomposición de la Economía y Educación, por el retraso que esta situación pandémica produce, queda la esperanza de que el replanteo social en las estructuras de las sociedades nos lleven a valorar los resultados que hasta ahora nos ha permitido sobrevivir. Por lo tanto, en esta obra, donde el conjunto de capítulos reflejan la inherente participación en la diversidad de temáticas planteadas, están agrupados trabajos considerados desde el perfil profesional de cada temática asumida por autores de diversos lugares del planeta.

En el Primer Volumen, que tiene como eje temático ***ESTUDIOS CULTURALES Y DESARROLLO HUMANO***, se detallan éstos aspectos que se reflejan en las disímiles comunidades que son estudiadas e investigadas por algunos autores en las problemáticas locales mostrando sus inquietudes, tanto a nivel etario, como de sus actividades, o profesiones.

Esperando que estos trabajos sean de gran aporte a los lectores, les deseamos una buena lectura.

SILVIA INÉS DEL VALLE NAVARRO
GUSTAVO ADOLFO JUAREZ

APRESENTAÇÃO

ESTUDOS CULTURAIS E DESENVOLVIMENTO HUMANO

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Enquanto esperamos por soluções que protejam o bem-estar na Saúde e com ela na recomposição da Economia e da Educação, pelo atraso que esta situação pandêmica produz, espera-se que o repensar social nas estruturas das sociedades nos leve valorizar os resultados que até agora nos permitiram sobreviver. Portanto, nesta coletânea, onde o conjunto de capítulos refletem a participação inerente à diversidade das questões levantadas, se agrupam obras consideradas a partir do perfil profissional de cada disciplina assumida por autores de diversas localidades do o planeta.

No Primeiro Volume, que tem como eixo temático ESTUDOS CULTURAIS E DESENVOLVIMENTO HUMANO, detalham-se esses aspectos que se refletem nas comunidades díspares que são estudadas e investigadas por alguns autores em problemas locais mostrando suas preocupações, tanto em nível de idade, quanto em suas atividades, ou profissões.

Esperando que esses trabalhos sejam de grande contribuição para os leitores, desejamos uma boa leitura.

SILVIA INÉS DEL VALLE NAVARRO
GUSTAVO ADOLFO JUAREZ

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MEASURING THE STRUCTURAL VALIDITY OF TWO NORDOFF-ROBBINS SCALES FOR A PATIENT WITH AUTISM

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Aline Moreira Brandão André
Universidade Federal de Minas Gerais
Belo Horizonte - Minas Gerais, Brazil
http://lattes.cnpq.br/2506551167425234
https://orcid.org/0000-0003-3115-7679

Cristiano Mauro Assis Gomes
Universidade Federal de Minas Gerais
Belo Horizonte - Minas Gerais, Brazil
http://lattes.cnpq.br/2458326202205195
https://orcid.org/0000-0003-3939-5807

Cybelle Maria Veiga Loureiro
Universidade Federal de Minas Gerais
Belo Horizonte - Minas Gerais, Brazil
http://lattes.cnpq.br/5470805433951697
https://orcid.org/0000-0003-2578-2400

ABSTRACT: Psychological studies aimed at validating tests have been taking place for several years and have influenced various professions, such as music therapy. Music therapy emerged as a profession after the Second World War and since then it has proved to be effective for the treatment of various health conditions. In recent decades, studies on the validity of music therapy instruments have increased. This current article aimed to verify the structural validity of two instruments for music therapy assessment called "Child-Therapist Relationship in Coactive Musical Experience Scale" and the "Musical Communicativeness Scale". As a methodology, the scales were used to evaluate 120 excerpts from music therapy sessions performed to a patient diagnosed with Autistic Spectrum Disorder (ASD). Different models were tested through item confirmatory factor analysis. The use of these two scales for measuring with confidence only general latent variable, the interaction, for the assessed patient was shown, considering the 120 excerpts of videos.
KEYWORDS: Music therapy. Structural Validity. Nordoff-Robbins Scales. ASD.

1 THE MEASUREMENT OF THE INDIVIDUAL NEEDS TO BE ESTIMATED

The current knowledge about the internal and external validity of the psychological constructs, as well as, the prediction of outcomes are – in essence – based on information from the population or groups of individuals. Important predictors can be cited which their evidence based on population, such as (i) self-regulatory and mediated processes (Cardoso, Seabra, Gomes, & Fonseca, 2019; Dias et al., 2015; Golino, Gomes, Commons & Miller, 2014; Gomes, 2007, 2010a; Gomes &

Borges, 2009a; Gomes, Golino, Santos, & Ferreira, 2014; Pereira, Golino, M. T. S., & Gomes, 2019; Pires & Gomes, 2018; Reppold et al., 2015), (ii) personality (Gomes, 2012a; Gomes & Gjikuria, 2017; Gomes & Golino, 2012a), (iii) socioeconomics variables (Gomes & Almeida, 2017; Gomes, Amantes & Jelihovschi, 2020; Gomes & Jelihovschi, 2019; Gomes, Lemos, & Jelihovschi, 2020; Pazeto, Dias, Gomes & Seabra, 2019), (iv) intelligence (Alves, Gomes, Martins, & Almeida, 2016, 2017, 2018; Golino & Gomes, 2019; Gomes, 2010b, 2011b, 2012b; Gomes & Borges, 2007, 2008b, 2009b, 2009c; Gomes, de Araújo, Ferreira & Golino, 2014; Gomes & Golino, 2012b, 2015; Muniz, Gomes, & Pasian, 2016; Valentini et al., 2015), and (v) metacognition (Golino & Gomes, 2014a; Golino, Gomes, & Andrade, 2014; Gomes & Golino, 2014; Gomes, Golino, & Menezes, 2014). The predictors with secondary importance follows the same rationality and their evidence are based on population, such as (vi) approaches to learning (Gomes, 2010c, 2011a, 2013; Gomes & Golino, 2012c; Gomes, Golino, Pinheiro, Miranda, & Soares, 2011), (vii) students' beliefs on teaching-learning processes (Alves, Flores, Gomes & Golino, 2012; Gomes & Borges, 2008a), (viii) learning styles (Gomes, Marques, & Golino, 2014; Gomes & Marques, 2016), (ix) motivation for learning (Gomes & Gjikuria, 2018), and (x) academic self-reference (Costa, Gomes, & Fleith, 2017).

Psychologists are trained by an old practice of more than 100 years that the validity of the psychological constructs and their respective measurements based on information of the population or groups of individual can be estimated and this estimation can be transfered directly to the individual. This direct transposition is technically wrong, according the ergodic theorems, what produces inadequate conclusions about the individual in all clinics' fields. There is an extensive body of arguments sustaining the postulate that the current clinic practice is not adequate. The interested reader can read more details in the works of Jelihovschi and Gomes (2019), Gomes, Araujo, Nascimento and Jelihovschi (2018), Ferreira and Gomes (2017), Gomes and Golino (2015), as Gomes, Araujo, Ferreira, and Golino (2014). To sum up, the measurement of the individual needs to be estimated if the clinician wants to produce proper inference about this person.

2 THE MEASUREMENT IN MUSIC THERAPY NEEDS TO ASSESS AN INDIVIDUAL

Music therapy emerged as a profession after the Second World War, when the therapeutic effects of music in hospitals began to become evident (Davis & Gfeller,2008). Since then, music therapy has been used in diverse populations in different areas such as: didactic, medical, psychotherapy, ecological, recreational and curative (Benenzon, 1988; Bruscia, 2000; Edwards, 2016; Davis, W. B., Gfeller, K. E., & Thaut, M. H., 2008; Thaut & Hoemberg, 2014; Wheeler, 2015). For a long time, music therapy studies focused more

frequently on clinical practice with experience reports, but in recent decades, studies on the validation of specific assessment instruments have increased (Gattino, 2020; Waldon & Gattino, 2018; Zmitrowiczab & Moura, 2018). Psychological studies to estimate in order to build a validity have influenced other areas such as Music Therapy (Andre et al., 2018; Andre, Gomes & Loureiro, 2017; 2020a; 2020b; 2020c; Gattino, 2020; Waldon et al., 2018; Waldon & Gattino, 2018). However, considering that psychometrics and other fields of measurement usually infer about the individual directly transposing the estimative of population to the person, music therapy has been influenced to do the same mistake. Gattino (2020) and Waldon and Gattino (2018) describe the importance of conducting studies to verify evidence of validity in several aspects, including structural validity. However, in the current literature, there is only the studies by Bergman et al. (2015) and Sampaio (2015). Bergmann et al. (2015) analyzed the factorial structure of "Music-based Autism Diagnostics (MUSAD)" in a group of 76 adults with intellectual and developmental disabilities. Sampaio (2015) verified the structural validity to the Protocolo de Avaliação da Sincronia Rítmica em Musicoterapia (Psinc). Unlike Bergmann et al. (2015), Sampaio (2015) evaluates the factor structure of the scale for a specific patient, estimating the parameters based on the own patient, which is a proper analysis to construct inference about the individual. However, the existence of only one study of structural validity in the music therapy literature with a focus on the individual reinforces the necessity to conduct new studies in this context.

In this article, two instruments for music therapy assessment has been developed from studies started in the 1960s in a partnership between the University of Pennsylvania and music therapists will be presented (Nordoff & Robbins, 2007). These two assessment tools are called "The Child-Therapist Relationship in Coactive Musical Experience Scale" (Escala de Relação Criança-Terapeuta na Experiência Musical Coativa) and "Musical Communicativeness Scale" (Escala de Comunicabilidade Musical). These two scales were translated for use in the Brazilian music therapy context by André; Gomes and Loureiro (2017, 2018, 2020a, 2020b).

Regarding the "Child-Therapist Relationship in Coactive Musical Experience Scale" and the "Musical Communicativeness Scale", we found data in the literature of studies carried out to verify content validity, inter-examiner reliability (André Gomes & Loureiro, 2017; 2018; 2020a) and correlation with others assessment instruments (Andre et al., 2018). The authors Nordoff and Robbins (2007) when presenting that scales, did not describe details about psychometric validity studies. To date, studies on the structural validity of that scales have not yet been published.

3 OBJECTIVE OF THE ARTICLE

This article aims to measuring the structural validity of the "Child-Therapist Relationship in Coactive Musical Experience Scale" and the "Musical Communicativeness Scale" in the evaluation of music therapy sessions performed with a child diagnosed with Autism Spectrum Disorder (ASD). So, the study objective is to evaluate the structural validity of these two scales for this patient, regarding to estimate the parameters of this individual.

4 METHOD

4.1 PARTICIPANTS

Participated in this study 1 patient and 1 music therapist researcher in this study.

Patient A was diagnosed for ASD and was 5 years old in the period in which the attendance occurred. At the beginning of the interventions, patient A did not vocalize and did not remain in an activity for a few time, no more them a few seconds. The therapeutic objective was to stimulate communication, attention and social interaction. The Method used with this patient was Music Centered Music Therapy. All sessions lasted 30 minutes. The improvisational music therapy technique was used for this patient. This technique was based on the construction of clinical themes. In short, it is based on mirroring musical fragments until the construction of clinical themes presented by the patient (Aigen, 2014; Brandalise, 2001; Freire, Moreira & Kummer, 2015; Freire, 2019).

For this study, it was used videos from two music therapy sessions, the first and the last in the interval of 4 months. The videos were cut in 30-second temporal units, totaling 120 sections. In addition, one of the researches in this study evaluated each of the 120 service segments using the "Child-Therapist Relationship in Coactive Musical Experience Scale" and the "Musical Communicativeness Scale".

The person responsible for the patient signed the Free and Informed Consent Form, allowing the recording of sessions and the use of videos in research. This study was approved by the Ethics Committee of the UFMG (Universidade Federal de Minas Gerais) and is registered under the number 04167218.2.0000.5149.

4.2 MEASURES

The "Child-Therapist Relationship in Coactive Musical Experience Scale" and the "Musical Communicativeness Scale" were used as a measuring instrument.

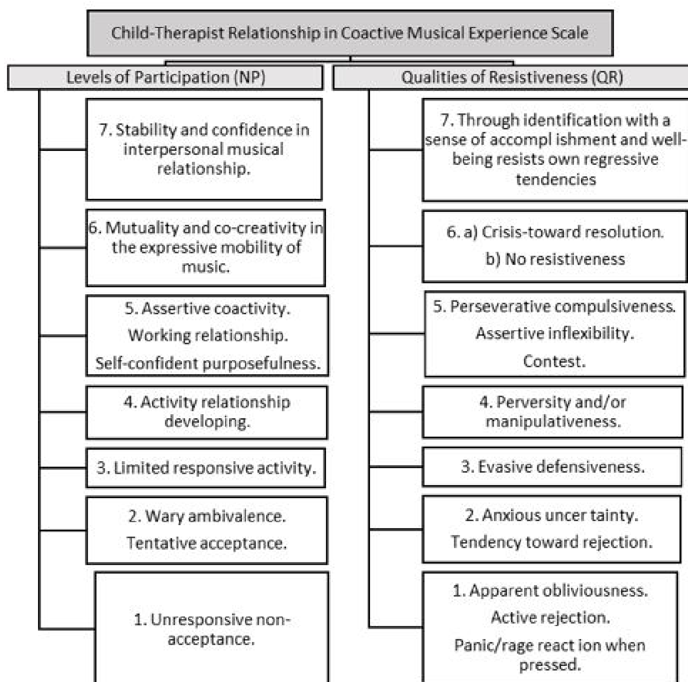
The first scale, "Child-Therapist Relationship in Coactive Musical Experience Scale", consists of 2 domains and seven degrees. The first domain allows to evaluate the levels of patient participation (NP – Níveis de participação) in seven degrees. The second domain

allows to evaluate in seven degrees if the patient presents resistivity during the service (QR – Qualidade de resistividade). On this scale, the higher the score, the more appropriate is the patient's behavior. For example: in the participation levels domain, the patient classified in grade 1 is the one who demonstrates no response to the therapist or does not accept the activity proposal while the patient classified in grade 7 is the one who demonstrates stability and trust in the interpersonal musical relationship. In the resistivity quality domain, the patient classified in grade 1 is the one who demonstrates active rejection or has reactions of panic or anger when pressed while the patient classified in grade 7 would be described as someone who, from the identification with a sense of accomplishment and well-being, resists its own regressive tendencies, being able to interact without resistivity.

The evaluation method of this scale used in the Brazilian context is the evaluation by checklist, where the music therapist marks the degree corresponding to each domain.

More details about the English version of this scale can be found in the studies by Nordoff and Robbins (2007). More details about the Portuguese version used in this article can be found in the studies by André, Gomes & Loureiro (2020a). An explanatory scheme of the items evaluated on the scale can be seen in figure 1.

Figure 1. Items of the "Child-Therapist Relationship in Coactive Musical Experience Scale".



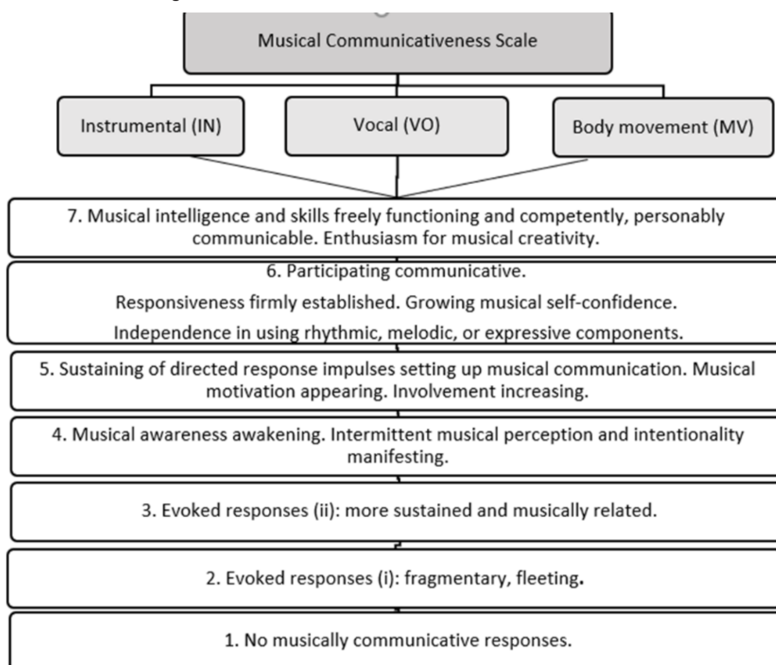
The second scale, "Musical Communicativeness Scale" is made up of 3 domains and 7 degrees. The domains allow the assessment of musical communicability in

instrumental (IN - instrumental), vocal (VO - vocal) and body movement (MV – movimento corporal). In this context, the lowest degree means the least expected communication (no communication) and the highest degree represents the best possible communication (musical intelligence and skills functioning freely, competently and apparently communicable, showing enthusiasm for musical creativity).

On this scale, the evaluating music therapist must mark the corresponding degree for each type of musical communication (vocal, instrumental and body movement). After marking the corresponding degrees, the scale allows that the sum of the values must be done in order to verify the total points referring to the musical communicability demonstrated by the patient. It is important to note that the scale was not designed for one patient to be compared to another, but for the patient to be compared with himself during the session. The authors Nordoff and Robbins (2007) point out that a patient going from grade 2 to grade 3 can be just as significant as a patient who scores in more advanced grades.

More details about the English version of this scale can be found in the studies by Nordoff and Robbins (2007). More details about the Portuguese version used in this article can be found in the studies by André, Gomes & Loureiro (2017). An explanatory scheme of the items evaluated on the scale can be seen in figure 2.

Figure 2. Items of the “Musical Communicativeness Scale”.



4.3 PROCEDURES AND DATA ANALYSIS

First two models were tested using item confirmatory factor analysis. The first model presupposed that the first two categories were explained by a latent variable corresponding to the measurement of the "Child-Therapist Relationship in Coactive Musical Experience Scale". On this scale, the latent variable consists essentially in the interaction between the patient and the music therapist. Although music is always present in interventions, the behaviors observed on this scale do not include specific analysis of musical production. Furthermore, this model presupposed that the last three categories were explained by a latent variable representing the measurement of the "Musical Communicativeness' Scale". On this scale, the latent variable consists of musical communication resulting from the levels at which the patient can communicate musically through instruments or vocalizations or even through body movements. In this context, the scale makes it possible to assess whether musical communication exists and the degree to which it occurs, whether in a fragmented or in a sustained manner throughout the entire music therapy session. The second model was an alternative model which had the same assumptions of the first model, but assuming that a general factor explained all the five categories and all the latent variables were orthogonal representing a bifactorial structure. In this context, the first scale is considered a representative of the general factor, interaction. Second, the model with the best data fit was selected to compose the third model. This model was the same of the best model but presupposed that the response of the patient was explained too his previous response. In other words, this model considered that there was a temporal dependence in the responses of the patient, so the behavior of the patient was influenced by the previous behavior (the code syntax are described in the supplementary material).

The item confirmatory factor analyzes as well the Mardia Test of multivariate normality were performed through the semTools R package (Jorgensen, Pornprasertmanit, Schoemann, & Rosseel, 2020). The data fit of the models was assessed by the Comparative Fit Index (CFI) and the Root Mean Square Error Approximation (RMSEA). CFI values equal or above .90 as RMSEA values smaller than .10 indicated that the model should not be refuted. The non-refuted models were compared through the chi-square and degree of freedom difference.

5 RESULTS AND DISCUSSION

Table 1 shows the descriptive statiscs of the five categories of the "Child-Therapist Relationship in Coactive Musical Experience Scale" and "Musical Communicativeness

Scale”. The first two categories come from the first scale while the last three categories pertain to the second scale. As can be seen, the response of the patient was more heterogeneous in certain categories, such as the category IN. This category had the lowest score for grade 1, which represents no musical communication and the grade 6 represents the highest score, which demonstrate stability of musical communication with independence in use rhythmic. The category MV was the more homogeneous, since the patient’s responses ranged from 1 to 4, which represents that initially there was no musical communication with body movements and later with the patient’s progress an intermittent musical body communication occurs intentionally. In the categories NP and QR of the “Child-Therapist Relationship in Coactive Musical Experience Scale”, it was observed variations between grade 2 and grade 6, which shows the patient’s improvement in the level of participation in the interventions and the quality of resistiveness.

Despite the skew and kurtosis of the univariate distribution suggest a normal distribution of the data, the Mardia Test showed that the multivariate distribution is non-normal (Mardia Kurtosis: $z = 6.58$, $p = 4.78$ e-11; Mardia Skew: χ^2 [35] = 328.54, $p = 2.13$ e-49). So, the maximum likelihood robust was the estimator of the item confirmatory factor analyzes.

Table 1. Descriptive Statistics of the Five Categories: NP (Levels of Participation), QR (Qualities of Resistiveness), IN (Instrumental), VO (Vocal) and MV (Body Movement).

categories	n	mean	sd	se	median	min	max	skew	kurtosis
NP	120	4.36	1.19	0.11	4.0	2	6	-0.26	-0.80
QR	120	4.48	1.02	0.09	4.0	2	6	0.02	-0.95
IN	120	3.63	1.61	0.15	3.0	1	6	0.23	-1.30
VO	120	2.48	1.72	0.16	1.0	1	5	0.49	-1.58
MV	120	2.19	1.19	0.11	2.0	1	4	0.34	-1.46

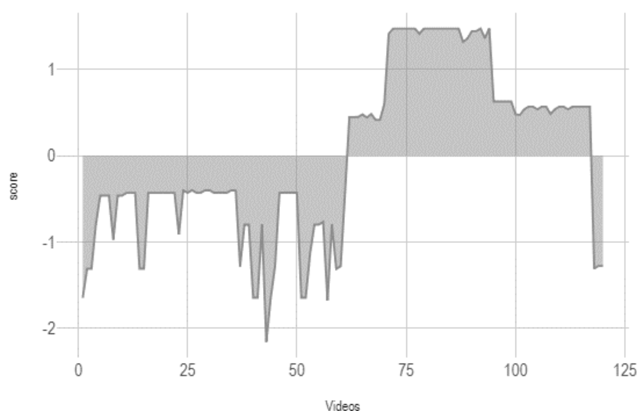
The data fit of the fist model indicated that this model needed to be refuted, since its RMSEA value was much higher than the cutoff value (χ^2 [4] = 27.47, CFI = .964; RMSEA = .221, RMSEA CI lower = .148, RMSEA CI upper = .303). The second model showed three problems. Its degree of freedom was zero, impeding the analysis. In addition, the category MV showed negative variance and the latent variable that explained the category NP and QR had two very small loadings of .041 and .135, indicating that this latent variable needed to be eliminated. So, the second model suffered a small change. The MV variance was constrained to be zero and the latent variable which explained the categories NP and QR was eliminated. The modified second model had a good data fit (χ^2 [3] = 2.98, CFI = 1.00; RMSEA = .000, RMSEA CI lower = .000, RMSEA CI upper = .153). The loadings

of the general latent variable on the five categories were high, ranging from .724 to .976 (mean = .855). The latent variable that explains the three categories of the second scale had a loading of .690 on MV, .154 on IN, and .372 on VO. The general latent variable had a Cronbach alpha reliability of .93 and a McDonnald omega of .88, presenting a good reliability. Despite the specific latent variable, which explains the three categories of the second scale, had a good reliability through the Cronbach alpha (.88), its McDonnald omega value was very inadequate (.17), indicating that its score is not reliable. In sum, both scales measure with reliable score a general latent variable, which is an innovative result. For this patient, considering the 120 videos, both the scales measure the same construct and not different constructs.

The modified second model was used to generate the third model. This model added the temporal dependence through a structure of lag 1. The third model had an inadequate data fit, according the RMSEA index (χ^2 [37] = 161.40, CFI = .929; RMSEA = .168, RMSEA CI lower = .142, RMSEA CI upper = .195). So, the modified second model was the model that best represented the response of the patient. Therefore, the two scales do not represent what they propose to measure for the patient A.

Figure 3 shows the score of the patient in the general latent variable. It is remarkable that the score of the patient was negative in the first 60 videos, which represented the first session, while the following videos, which represented the last session, had, in majority, positive scores. This indicates that, very probably, the music therapy sessions were effective to improve the general latent variable of the patient.

Figure 3. Score of the Patient in the General Latent Variable.



The data represented on figure 3 actually describe what happened during the two assessments evaluated in relation to the relationship and a communication that

occurred in the musical experience between the patient and the music therapist. In the first session of patient A, the same topic was interested in musical instruments, but his musical communication and his relationship with a music therapist were fragmented and fleeting. The patient also did not vocalize at that time.

In the last session of the semester, A's behavior became better as he built a clinical musical theme together with a music therapist. This theme was composed of variations of tempo and vocalizations with variations of vowels, to demonstrate an improvement in the relationship with the music therapist, in musical practice and in non-musical aspects, such as vocalization.

When analyzing the results of patient A, it was found that the latent variable identified in conjunction with the two scales measuring together suggested that it can be the result of development of patient-therapist interaction. In fact, patient A arrived for the first session with difficulties in social interaction, which is common in ASD individual's that looking for music therapy treatment. However, in the last session, it was possible to observe improvement to this issue.

It is interesting to note that the analysis carried out in this study demonstrated that the "Child-Therapist Relationship in Coactive Musical Experience Scale" and the "Musical Communicativeness Scale" were considered valid for patient evaluation A. Gomes, Araujo, Nascimento and Jelihovschi (2018) describe how much the validation of a test for the evaluation of an individual can be complex. Hence, they clarify that only the application of tests several times with the same individual by capturing the variance that can enable the individual to be estimated.

Several studies have shown that the "Child-Therapist Relationship in Coactive Musical Experience Scale" and the "Musical Communicativeness Scale" have been used more frequently over the years both for assessing people with ASD, and for evaluating people with other conditions , with studies published in English (Cripps; Tsiris & Spiro, 2016; Nordoff & Robbins, 2007; Spiro; Tsiris & Cripps, 2017; Carpente & Aigen, 2019) and in Portuguese (André, 2017; André; Gomes & Loureiro, 2016 , 2017, 2019; 2020a; 2020b; André & Loureiro, 2019a, 2019b; Freire, 2014; Sampaio, 2015; Silva, 2017; Zmitrowiczab & Moura, 2018). These scales have shown positive results in several approaches to music therapy, as well as having good inter-examiner reliability and good correlations with other measurement instruments such as the "Childhood Autism Rating Scale", the "Autism Treatment Evaluation Checklist" and the "Improvisational Assessment Profiles" (Andre et al., 2018).

As stated by the authors Nordoff and Robbins (2007) a small improvement in the degree scored in the patient's evaluation can be as important as a larger difference in scores in another patient. This reinforces the necessity to always develop studies

taking into account the peculiarities of each individual, as well as what would be the best appropriate assessment tool for them.

6 CONCLUSION

In Music Therapy, most of the validation research on assessment instruments is recent, dating mostly from the last two decades (Waldon & Gattino, 2018). However, music therapy studies focused on analyzing the structural validity of assessment instruments based on the individualize is still scarce. In the literature we find only the study by Sampaio (2015) that analyzed the PSinc.

In this study by verifying the “Child-Therapist Relationship in Coactive Musical Experience Scale” and the “Musical Communicativeness Scale”, it was found good results in the general latent variable of the scales analyzed. This result demonstrates that the scales were considered valid for patient A. However, for patient A, the two scales individually do not measure what they propose to measure. In addition, it was found that he showed considerable improvement during the sessions, which shows that Music Therapy provided positive gains in his development.

Through the results obtained with patient A, it was found that may there be the two scales measured the interaction as a single latent variable. This result reinforces the proposal of the authors Nordoff and Robbins (2007) that the scales should be used together. According to the authors, the scales are complementary in the overall assessment of the patient. For future studies it is suggested the possibility to transform these two scales into one, considering their general latent variable.

These results are innovative, since no studies was found with this type of analysis for these scales in the literature. It is allowed to rethink the scales considering new possibilities of interpretations.

It is expected that this study will contribute to further research on structural validity with other assessment instruments, other individuals and other diagnostics.

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SOBRE OS ORGANIZADORES

SILVIA INÉS DEL VALLE NAVARRO: Profesora y Licenciada en Física, Doctora en Ciencias Física. Directora del Departamento de Física de la Facultad de Ciencias Exactas y Naturales de la Universidad Nacional de Catamarca, Argentina. Editora de la Revista Electrónica "Aportes Científicos en PHYMATH" – Facultad de Ciencias Exacta y Naturales. Profesora Titular Concursada, a cargo de las asignaturas Métodos Matemáticos perteneciente a las carreras de Física, y Física Biológica perteneciente a las carreras de Ciencias Biológicas. Docente Investigadora en Física Aplicada, Biofísica, Socioepistemología y Educación, dirigiendo Proyectos de Investigación de la Secretaria de Ciencia y Tecnología de la Universidad Nacional de Catamarca con publicaciones científicas dentro del área Multidisciplinaria relacionado a fenómenos físicos-biológicos cuyos resultados son analizados a través del desarrollo de Modelos Matemáticos con sus simulaciones dentro de la Dinámica de Sistemas. Participación en disímiles eventos científicos donde se presentan los resultados de las investigaciones. Autora del libro "Agrotóxicos y Aprendizaje: Análisis de los resultados del proceso de aprendizaje mediante un modelo matemático" (2012), España: Editorial Académica Española. Coautora del libro "Ecuaciones en Diferencias con aplicaciones a Modelos en Dinámica de Sistemas" (2005), Catamarca-Argentina: Editorial Sarquís. Miembro de la Comisión Directiva de la Asociación de Profesores de Física de la Argentina (A.P.F.A.) y Secretaria Provincial de dicha Asociación.

GUSTAVO ADOLFO JUAREZ: Profesor y Licenciado en Matemática, Candidato a Doctor en Ciencias Humanas. Profesor Titular Concursado, desempeñándome en las asignaturas Matemática Aplicada y Modelos Matemáticos perteneciente a las carreras de Matemática. Docente Investigador en Matemática Aplicada, Biomatemática, Modelado Matemático, Etnomatemática y Educación, dirigiendo Proyectos de Investigación de la Secretaria de Ciencia y Tecnología de la Universidad Nacional de Catamarca con publicaciones científicas dentro del área Multidisciplinaria relacionado a Educación Matemática desde la Socioepistemología cuyos resultados son analizados a través del desarrollo de Modelos Matemáticos con sus simulaciones dentro de la Dinámica de Sistemas y de la Matemática Discreta. Autor del libro "Ecuaciones en Diferencias con aplicaciones a Modelos en Dinámica de Sistemas" (2005), Catamarca-Argentina: Editorial Sarquís. Coautor del libro "Agrotóxicos y Aprendizaje: Análisis de los resultados del proceso de aprendizaje mediante un modelo matemático" (2012), España: Editorial Académica Española. Desarrollo de Software libre de Ecuaciones en Diferencias, que permite analizar y validar los distintos Modelos Matemáticos referentes a problemas planteados de índole multidisciplinarios. Ex Secretario Provincial de la Unión Matemática Argentina (U.M.A) y se participa en diversos eventos científicos exponiendo los resultados obtenidos en las investigaciones.

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EDITORA
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