Integrating music therapy into diagnosing context of autism spectrum disorders

Candidate nr. 101

Thesis submitted in fulfilment

of the requirements for the Master's degree

University of Bergen

May, 2019

Acknowledgements

Abstract

The purpose of this study is to explore how music therapy approaches can complement the existing diagnostic context of autism spectrum disorder (ASD). Using the integrative literature review as methodology, the data from both medical and music therapy contexts on the subject of assessment of ASD was gathered and synthesized. The new knowledge that was generated in this way indicates that the existing diagnostic context of ASD assessment, even though psychometrically-tested for evaluating impairments of ASD, could potentially benefit from including music therapy assessment in its current structure. The properties of music therapy as a humanistic discipline can provide unique insights into the assessment and overall interpretation of ASD.

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Without science, therapy can degenerate to the practice of superstitious ritual, in which each practitioner owes allegiance only to his or her personal myth of existence. Without art, it can lose the very humanity it seeks to examine

(Feder & Feder, 1998, p. ix).

1 INTRODUCTION

The purpose of this study is to explore if music therapy assessment can complement existing diagnostic evaluation for Autism Spectrum Disorders (ASD). Music therapy is successfully used as a complementary treatment for ASD (Boster, McCarthy, & Benigno, 2017), but it is not commonly included in the diagnostic process of ASD (Wigram, 2000). For the further development of music therapy as a discipline I think that it is essential to search for ways to include music therapy as a complementary method in the diagnostic context of ASD. Music therapy as a discipline includes both natural-science and humanistic orientations (Bruscia, 2014; Waldon & Gattino, 2018). Inclusion of music therapy approaches that successfully combine medical and humanistic values could potentially enrich the final diagnostic picture by providing the medical information about the child's level of functioning (presence of impairments) from medical professionals, and also the information about other facets of the child's potential through music therapy assessments.

Evolution of autism

Autism spectrum disorder (ASD) is defined as "a neurodevelopmental disability characterized by impairment in social-communication skills and the presence of restricted or repetitive behaviors" (American Psychiatric Association [APA], 2013). Even though this current definition had undergone a long historical evolution, defining autism spectrum disorder is still an ongoing process. If we look at autism through the historical lens, we can see that the first written case that reported the unusual behavior of one boy (behavior that is described resembles impairments often found in autism) dates all the way to 18th century, where it was described as a form of madness (Haslam, 1809). Haslam (1809) described the boy as seven years old when he first met him. The boy's mother reported that the child was developing very slowly both physically and mentally. He developed language around his fourth year but was not using it efficiently. Haslam (1809) observed that the boy had the ability to imitate, a need for social isolation, as well as a need for self-stimulation through repetitive stretching.

The term "autism" appears in the medical literature in 1911. It was introduced by the Swiss psychiatrist, Eugen Bleuler, who used this term to describe the withdrawal behavior of children he considered to be schizophrenic (Irwin, MacSween & Kerns, 2011). "The origin of the term autistic is from Greek autos (self) and ismos (a suffix of state of action)" (Irwin et al, 2011, p. 3). This term appears again in 1943, this time in the form of the noun "autism" in an article by Austrian psychiatrist Leo Kanner (1943). In his article, Kanner (1943) presented cases of 11 children that he described as autistic, thereby dismissing the hypothesis of

schizophrenia. Instead, he emphasized autism as a developmental disorder, since it is present from the beginning of life. He wrote:

While the schizophrenic tries to solve his problem by stepping out of a world of which he has been a part and with which he has been in touch, our children gradually compromise by extending causing feelers into a world in which they have been total strangers from the beginning. (Kanner, 1943, p.249)

Refrigerator mother theory and other theories of ASD

At the beginning when the word "autism" got its place in medical books, the understanding of what causes autism was influenced by psychodynamic trends in psychiatry (Irwin et al., 2011). Kanner believed that autism was caused by mothers who failed to show love and affection towards their children (Irwin et al., 2011). He presented this idea carefully in the beginning, by only mentioning the presence of a genuine lack of affection from family members, especially mothers (Kanner, 1943). Two decades later he stated his opinion on the causation of autism more clearly in one interview, where he described that parents of children with autism were so cold and that they managed to "defrost enough to produce a child" (as cited in Irwin et al., 2011, p. 4). His claim was the reason why autism was considered to be caused by "refrigerated mothers" for many decades to come (Irwin et al., 2011).

Psychoanalytic approaches to defining autism continued in 1960's through the work of Austrian child psychologist Bruno Bettelheim. Bettelheim not only agreed with Kanner's hypothesis about mothers, in his book *The empty fortress: Infantile autism and the birth of the self* (1967), he went further to compare mothers of autistic children with Nazi prison guards. Bettelheim himself had spent the Second World War as a prisoner in concentration camps. He explained that the empty gaze often seen in children with autism is a reaction to the negligence of parents (mothers primarily) and compared it with the look of prisoners in the camps. He suggested that autism is a condition that a child develops as a response to extreme situations such as hostilities from mothers (Bettelheim, 1967).

Medical evaluation and diagnosis

The psychoanalytic approach lost its popularity with the development of technology and the expansion of research in the field of ASD. Findings from the field of genetics indicate that the cause of ASD is multifactorial and includes both genetic and biological factors (Irwin et al., 2011). Siblings of children with ASD have a 20 - 60% higher risk of developing autism themselves (Sokol & Lahiri, 2011). The X chromosome abnormalities are found to be directly

responsible for a 1:4 gender ratio found in ASD, meaning that the statistical disproportion of ASD that affects boys is four times more than girls (Sokol & Lahiri, 2011). The female DNA that consists of two copies of X chromosomes, while male has only one copy and therefore four times higher risk of developing ASD (Sokol & Lahiri, 2011).

The roots of modern perspectives on the evaluation of behavior in ASD began in 1958, with the work of psychologist Hans Eysenck and his colleagues who opposed the psychoanalytic interpretation, and advocated for empirical-based approaches (Adams & Matson, 2016). Their collaboration led to the development of the first assessment and diagnostic tools that could be applied by all psychiatrists (Adams & Matson, 2016). The criteria were based on the direct observation of behaviors that is known nowadays as "triad of impairment" (impairments of reciprocal social interaction, verbal and non-verbal communication, and imagination) (Luteijn, Luteijn, Jackson, Volkmar & Minderaa, 2000, p. 317). However, the classification and understanding of autism is still an ongoing process. From the 1990's, diagnostic categorization of Pervasive Developmental Disorders (PDD) by the American Psychiatric Association (APA, 2013) and the World Health Organisation (WHO, 2017) spoke of the "autistic continuum" and included Autistic Disorder, Asperger Disorder, Rett Disorder, and Childhood Disintegrative Disorder (Luteijn et al., 2000, p. 317). These disorders display common behaviors that were categorized as the triad of impairments (Luteijn et al., 2000).

According to the Centers for Disease Control and Prevention (CDC, n.d.), the process of evaluation of ASD occurs in two phases:

1) Developmental screening
2) Comprehensive Diagnostic Evaluation

Developmental screening is a part of standard pediatric developmental evaluation, with the purpose of targeting the children that are at risk of developing ASD.

The comprehensive diagnostic evaluation is the next step in the process after the initial warning signs were detected (CDC, n.d.). Comprehensive diagnostic evaluation is a procedure that can include a variety of medical professions, including developmental pediatrics, child psychology, neurology, and child psychiatry (CDC, n.d.). This means that ASD is evaluated by an interdisciplinary approach within the field of medicine.

1.1 Music therapy and ASD retrospective

Music therapy as a profession started developing at the same time when the word "autism" was first mentioned in medical books in the 1940's (Reschke-Hernandez, 2011). Beneficial

aspects that music therapy has on children with autism were noticed from the beginning of music therapy interventions with this particular client group (Reschke-Hernandez, 2011). In the 1940's it was common practice for children with autism to be placed in medical institutions, where the first music therapy treatments were organized for them (Rechke-Hernandez, 2011). The first music therapy activities that were used had a more structured form, using dance rhythms and singing exercises (Geretsegger et al., 2015). The interest in music therapy assessments for ASD grew alongside with the continual development of music therapy as a discipline since the 1940s.

Nordoff and Robbins (1968) wrote about the beneficial potential that improvised music has on children with autism. A decade later they published a book called *Creative music therapy, individualized treatment for the handicapped child* (Nordoff & Robbins, 1977) which illustrates the necessity to use creative, improvisational approaches to assess the behavior of children with developmental disorders. The authors included a description of the procedures they used in their assessments. Improvisational music therapy (IMT) is still a common approach in the assessment of behavior in music therapy treatment for this population (Geretsegger et al., 2015; Mössler et al., 2017).

Apart from observing the outward manifestation of ASD such as stereotypical behavior, difficulties in behavior regulation and socialization, music therapy also offers a window into the child's inner world. The work of psychologist Daniel Stern describing the world of infants (1985) was very influential in the field of music therapy. Stern (1985, p.142) introduces the term "affective attunement" as a way in which the infant reacts to the mother's voice and facial expressions in the infant's early interactions with the mother. This term is adapted and used in music therapy as a technique in which music therapist is using "musical attunement" (Schumacher, Calvet & Reimer, 2018, p. 213) when working with a child to re-create mother-infant form of early communication (Schumacher, Calvet & Reimer, 2018). The Assessment of the Quality of Relationship (AQR scale) was developed based on these theoretical grounds to measure the quality of interaction between the child and music therapist for the population with ASD (Schumacher et al., 2018).

In the past seven decades, the body of knowledge regarding the positive effects of music therapy for ASD has increased. The data from an extensive systematic review and meta-analysis conducted in 2017 supports the idea that music therapy is beneficial in addressing impairments commonly found in children with autism (Boster, McCarthy & Benigno, 2017). The positive effect was measured in the treatment setting, as well as outside the intervention

setting and in the parent-child relationship (Boster et al., 2017). The conclusion based on the data that was collected was that this form of therapy is beneficial for children (Boster et al., 2017). However, it is essential to mention that music therapy is generally used in care-related context, and besides a few exceptions, the use of music therapy evaluation is not part of the standardized diagnostic process (Wigram, 2000).

1.2 Research question

In this master thesis I will try to answer the following research question:

How might music therapy approaches/methods complement existing standardized diagnostic tools in the medical context of evaluating children with ASD?

1.3 Background for the research question

Early detection and intervention are key elements for ASD treatment (Steiner, Goldsmith, Snow & Chawarska, 2012). This is supported from both the biological and environmental perspective. The young infants' brains during the early phase of intensive development are more easily susceptible to interventional measures, and that some of the social codexes can be taught more successfully early on in their lives (Steiner et al., 2012). Diagnosing the child at an early age seems to be a common meeting point of both the medical professionals and the parents. From the medical perspective, early diagnosis is essential, because it opens the door for early interventions that will evidently be crucial for positive outcomes later in life (Corsello, Akshoomoff, & Stahmer, 2012).

The process of diagnosis affects not only the child but the other family members as well. Parents report that dealing with a suspicion about their child having ASD could cause severe problems related to stress (Osborne & Reed, 2008). The factor of stress can reflect itself in a number of different dysfunctional problems such as depression, dysphoria and general dysfunction of family dynamics (Osborne & Reed, 2008). Parents agree that early diagnosis can help with stress reduction, meaning that the tension built upon the feeling of uncertainty whether the child has ASD or not is much lower in parents who received the diagnosis within a short waiting time period, compared to the group of parents who had to wait longer (Brogan & Knussen, 2003; Holliday, Stanley, Fodstad, & Minshawi, 2016). In consideration for the parents, having a timely closure about the child's condition is therefore one of the main reasons for adjusting evaluation tools for early diagnosis.

The stress level can also be increased by the negative experience of communication with healthcare professionals that are involved in the diagnosis process (Brogan & Knussen, 2003),

and it could potentially lead to the lack of parental involvement in early intervention programs (Osborne, Mchugh, Saunders, & Reed, 2008). The role of the parent as an educator is something that should be encouraged, since the learning process and support of a child's development is an everyday routine for families with children diagnosed with ASD (Osborne et al., 2008).

In 2008, a study was done in the United Kingdom, in order to determine how parents perceived communication with the healthcare professionals during the diagnosing process. The results showed that half of the parents of the preschool children participating in the study felt that the diagnosis procedure was done in a cold manner. They were left feeling poorly informed and cut off from the important information about ASD in general. They also worried that their children were not seen as unique individuals with unique potential, but that the healthcare professionals' only focus was to find out whether or not the child has ASD (Osborne & Reed, 2008).

A similar study involving interviews with the parents to explore their perspective of their experience of the diagnostic process was completed in Sweden (Carlsson, Miniscalso, Kadesjö, & Laakso, 2016). The findings were similar to the study done in the United Kingdom, meaning that once again, parents reported feeling alone, both during and after the process (Carlson et al., 2016). Some of the parents from the study in Sweden reported that they felt "the experts did not have a chance to see the child's full potential since the assessment was done in the environment unfamiliar to the child" (Carlsson et al., 2016, p. 333).

Parental studies indicate that there is a need for a more thorough and child-oriented approach to complement the existing diagnostic structure in order to provide a richer and more precise evaluation about the child's overall level of functioning. This comprehensive approach should also include an assessment of the child's potentials and strengths. Music therapy approaches can fulfil this complementary role. Music therapy approaches to children with ASD can be described as child-led (Wigram & Lindahl Jacobsen, 2018) and autism-friendly (Begrmann, 2018). The purpose of this study is, therefore, to explore the possibility of including such approaches into existing standardized tools, so as to provide a complementary approach for a more thorough evaluation.

1.4 Glossary of terms

Music therapy - "Music therapy is a reflexive process wherein the therapist helps the client to optimize the client's health, using various facets of music experience and the relationships formed through them as the impetus for change." (Bruscia, 2014, p. 36). I will use this definition in my understanding of music therapy assessment as a reflexive process, experience and relationship that has the purpose to understand the potential in child's condition as a way of optimizing resources that are needed for change and improvement of functioning.

Music - Bruscia (2014, p. 45) defined the use of music as "music in therapy, or music as therapy". Based on Bruscia's (2014) definition and my personal understanding, I interpret music in music therapy assessment as a threefold dimension that can be used as a tool to help the therapist in the assessment, as a process that occurs between the child and a therapist, and as a general music experience of the assessment.

Health - My understanding of health is in alliance with the definition of World Health Organization that defines health as "a state of complete physical, mental and social well-being and not merely the absence of disease, or infirmity" (WHO, n.d.). In the context of the assessment of ASD, I understand health as a twofold concept: a child can be assessed for condition described as ASD, but the child's wellbeing can also be assessed within this condition.

ASD - stands for Autism Spectrum Disorder. When defining autism, two perspectives appear to dominate: medical and social. The first and more dominant is the medical one that defines ASD as "a neurodevelopmental disability characterized by impairment in social-communication skills and the presence of restricted or repetitive behaviors" (American Psychiatric Association, 2013).

Autism is also defined as neurodiversity in the autistic community and by the individuals who live with this condition (Krcek, 2012). The term neurodiversity is their attempt is to advocate for the understanding of ASD as a state of being and functioning, rather than abnormality, or disability. They perceive disability to be a social construct rather than the personal experience of living with ASD (Krcek, 2012).

1.5 Disposition

In chapter 1, I present the background of my choice, the research question and explaining my current position regarding the research question. In this chapter, the most important terms from the thesis are defined. In chapter 2, I present the research methodology and explain why

I have chosen the integrative literature review as a methodology for this study and how I have chosen to position myself as an interpretivist in this study. In this chapter, the inclusion and exclusion criteria for gathering data is presented. In chapter 3, the data that was selected will be presented accordingly to the methods described in chapter 2. In chapter 4, the data are integrated and discussed. Chapter 5 addresses the research question as well as the conclusion for this study.

2 METHOD AND METHODOLOGY

In this chapter, I will describe my approach to answering the research question and the exact scientific steps in the process of this study.

2.1 Methodology. Integrative literature review

"Reviews can attempt to integrate what others have done and said, to criticize and/ or to identify the central issues in a field" (Cooper, 1989, p.13).

This design can enable an overview of different studies from the field of ASD that as a result provide a selection of the instruments that relate to the same topic (assessment and diagnosing of ASD) and music therapy perspectives on the same topic. The thorough summarization can provide enough information about some aspects that are lacking and need further improvement (Cooper, 1989). In this paper, the topic of assessing ASD will be analysed by integrating the body of knowledge about this process from the clinical and music therapy perspectives.

In order to answer the research question, two sets of data will be collected to present two models of assessment. Torraco (2005) points out that the integrative literature review is used for integrating knowledge from two models that can be described as competitive. The models that will be analysed present two contexts of evaluation for ASD: the medical and music therapy contexts. While my pre-understanding of these contexts is that they are complementary rather than opposing, they can also be interpreted as competitive in a sense that the medical definition of ASD presented in chapter 1 defines the behavior of individual with ASD as an impairment (APA, 2013), whereas the individuals that are living with ASD do not see themselves as impaired, but just different from the majority (Krcek, 2012). Since music therapy assessment for ASD is client-based and child-led (Wigram & Lindahl Jacobsen, 2018), and is also medicaly informed about what kind of impairments it needs to measure in ASD (Bergmann, 2018), this indicates that the understanding of client's behavior

is observed from various perspectives, that include more than one orientation. Therefore, these two contexts can be both complementary and competitive.

The integrative review is a broad design that allows simultaneous inclusion of empirical and theoretical knowledge (Whittemore & Knafl, 2005). In this study, I will integrate the knowledge from music therapy and medicine, two different disciplines, one of which is, in essence, empirically based and the other one is from the field of humanistic disciplines. In the introduction chapter, it was mentioned that existing evaluation and assessment for ASD is based on the empirical model. In music therapy assessment, other approaches, such as IMT, are used, and the assessment is based on other standards that do not include rigorous empirical testing (Chase, 2004). This is the reason why I think that integrative literature review is the design that can provide the best presentation of knowledge from these two disciplines by including data from both experimental and non-experimental research.

In order to accurately explore the idea of the potential need for integration of music therapy assessment (that will be addressed in the discussion chapter), data will be presented in form of analysis of the evaluation and selectively gathered diagnostic instruments. I will follow five research phases that are suggested by Cooper (1989):

1) Problem formulation;
2) Data collection;
3) Evaluation of data points;
4) Analysis and interpretation;
5) Presentation of results.

2.2 Method. Content analysis

1) The aim of the study is to explore how music therapy assessment can complement existing standardized diagnostic tools.

2) Selective sampling of the instruments most commonly used in diagnosing ASD will ensure that the data accurately represents the body of instruments that are currently used in the medical context. The procedure of collecting and selecting relevant data will be presented in this chapter.

3) Once they are selected, the instruments will be grouped by their common features and presented in the table. If some instruments are found to be extraordinary comparing to others in the manner they evaluate/diagnose ASD, they will also be presented. Since this study is not experimental in its design, this research phase will not include the data points. Instead, the

content analysis of the data will be done. The content of the literature that fits the inclusion criteria is the subject of analysis in the process of this study. "Content analysis entails a systematic reading of a body of texts, images, and symbolic matter, not necessary from an author's or user's perspective" (Krippendorff, 2004, p. 3). Based on this definition, the content of instruments for comprehensive diagnostic evaluation for ASD will be analysed through the perspective of music therapy approaches. In order to gather and describe the selected data, it will be grouped by specific and common characteristics which in this study will be referred to as "features". The content of the data will be further analysed through the music therapy perspectives on assessment for ASD. "Once content analyses have chosen the context within which they intend to make sense of a given text, the diversity of interpretations may well be reduced to a manageable number (Krippendorff, 2004, p.24). For the purpose of this study, it is not important to collect all the assessment and diagnostic instruments, but only those that are most commonly used. This will limit the content analysis to a manageable number of instruments whose content will be analysed.

4) The analysis and interpretation chapter will be presented through discussion. The chosen approach belongs to the qualitative discipline research that addresses the music therapy involvement in the areas of assessment, treatment, and evaluation (Brusica & Wheeler, 2016). My position in this study can be described as the one from an interpretivist view of the current approach to ASD assessment, which is observed as a construction based on both benefits and limitations of this particular medical context.

5) The conclusion chapter will provide the insights to respond to the research question.

2.3 Hermeneutics

The philosophical theory in the study is necessary because it provides us with a lens through which we will be looking for information (Wheeler & Bruscia, 2016). It also helps to understand what the study aims to find out regarding a particular topic it is exploring. Modern hermeneutics roots come from Ancient Greek philosophy and the idea that language serves a purpose of interpreting "non-linguistic impressions made by the things of mind" (Bowie, 2015, p. 2). Whittemore & Knafl (2005) pointed towards importance of theoretical, or philosophical perspective in the integrative reviews. I understand autism as a mind-made concept that is evolving with the increase of our knowledge on the topic. However, I think that in the very core of autism one feature is constant: it is a condition within a human being. Hermeneutics is a system of thinking that tries to understand how "each is only posited with and by the other, just as whole cannot be thought without the single part as a member of it and

the single part cannot be thought without the whole, the sphere in which it lives " (as cited in Bowie, 2015, p, 3). For me, the spirit of the whole is a human being that is in the center of the diagnostic structure. From my pre-understanding, based on the parental reports, the human and individualistic nature of the child as an individual is missing from the current diagnostic model. Therefore, my study could be described as hermeneutically and humanistically oriented.

2.4 Procedures

Collection of data occurred in two phases. First, I collected data for assessing and diagnosing instruments from the medical context, and in the second phase, I collected data for assessing ASD in music therapy context.

2.4.1 Collecting data about existing standardized tools for ASD evaluation (medical context)

I chose to search in the ORIA database because ORIA enables access to a variety of different databases that are relevant for terms used in the research question. They regard the fields of medicine, art, and therapy. I used "instruments for assessing and diagnosing ASD" as the key phrase for the search. Initial findings present 1658 different titles. From this vast pool of data, I have decided to do purposeful selection to ensure that the selected data can provide maximum variation (Palinkas et al., 2015), and to ensure that the findings will represent a variety of different instruments.

In this case, I wanted to find out what are the protocols of assessing and diagnosing for ASD, meaning what specific instruments are used for this purpose. I have decided to choose literature that can provide overall knowledge on the topic of assessment and diagnosing and that includes a pool of different instruments that are used for this purpose. Three books rich with information on assessing and diagnosing ASD were selected:

1) Volkmar, F. R., Paul, R., Rogers, S. J., Pelphrey, K. A. (Eds.) (2013), *Handbook of autism and pervasive developmental disorders* (3rd ed.). Hoboken, Canada: John Wiley & Sons.
2) J. L. Matson (Ed.) (2016), *Handbook of assessment and diagnosis of autism spectrum disorders*. Cham, Switzerland: Springer International
3) J. L. Matson & P. Sturmey (Eds.) (2011), *International handbook of autism and pervasive developmental disorders*. New York, NY: Springer International.

From these books, the research was narrowed down to identify instruments that are most commonly used in assessing and diagnosing ASD. It is important to mention that majority of instruments are described in a form of protocols, or manuals, because the original instruments with the scoring system and exact questions are not in domain of information that is shared with the general public. Some of the instruments are also the property of different institutions (hospitals, universities). However, during the research, the additional data was gathered in the form of literature written by original instrument designers that contained a rich and thorough explanation of how their instruments evaluate ASD. They were coded and presented in table 1, whereas books, in general, were used for assembling theoretical knowledge that was necessary for understanding the terminology and features of selected instruments.

When sampling instruments, the following criteria were used:

1) Instruments are used as part of the standard international screening and diagnosing of ASD
2) Instruments are a part of established medical literature on ASD
3) Selection included only those instruments that address ASD impairments, rather than instruments that screen general developmental impairments
4) Only the instruments that are used for evaluation/diagnosing of children are included
5) Only the revised version of the instruments will be presented

Some exclusion criteria have also been formulated:

1) Instruments that are in experimental phase
2) Instruments that are used in biological, neurological, and genetic research, because they are not part of the standard diagnostic procedure
3) In the year 2013, the new revision of psychiatry´s Diagnostic and Statistical Manual of Mental Disorders (DSM-5) classification is combining Autistic Disorder, Asperger Disorder, Childhood Disintegrative Disorder, and Pervasive Developmental Disorder (not otherwise specified) into a single diagnosis of ASD (APA, 2013). Therefore, all the instruments that measure Asperger Disorder are excluded.
4) Older versions of revised instruments are excluded

2.4.2 Collecting data from the music therapy assessment for ASD

In the second phase of the search for data that I started in the ORIA database, I used "music therapy tools for assessing and diagnosing ASD" as the key phrase for the search. I have changed the search word "instruments" that was used in the first search phrase, because the

interest of this study is not to find out what music instruments are used, but rather what tools (scales, assessment instruments) are used in music therapy. In the majority of music therapy literature I came across during the search, the word "assessment" was used as a term that is measuring the effects of music therapy on children that are already diagnosed. I have then tried to search by using the terms "evaluating" and "screening" instead, since these terms are also used in medicine when addressing assessment for ASD. The findings were again not usable, because of the same reason. Therefore, I decided to do a selective sampling following the recommendation of Torraco (2005) about selecting the data through relationship, and similar patterns. In order to find the relationship and similar patterns between these two contexts, the first portion of selected data from the standard diagnostics needed to be analysed.

The method that I used to analyse data is content analysis. Based on this method (that will be presented in depth in chapter 3), the instruments that were selected in the first search were analysed by their common features, coded and presented in table 2. Data for music therapy diagnosing and assessment were collected based on the common features of medical instruments that were detected in the content analysis.

Since all instruments from the medical context were collected from Handbooks of ASD, I have decided to include the book by E. G. Waldon & G. Gatino (Eds.) (2018), *Music therapy assessment: Theory, research, and applications,* London, UK: Jessica Kingsley. Following the same procedure, I have decided to use some chapters from the book as a theoretical frame for instruments that were selected, as well as to sample individual instruments that assess ASD, so that they can be analysed in chapter 3. Seven chapters from this book were selected because they contain information about protocols and different assessment tools for ASD. The tools that will be analysed are based on the description presented in the book chapters because original instruments were not found for the same reason the originals instruments from medical literature were not found. However, the selected book chapters were written by the original designers of music therapy tools and contain a thorough description of how these tools operate. The exception is the "Evidence-Based Analysis" (Wigram & Lindahl Jacobsen, 2018) chapter that was written and published after its designer (Tony Wigram) died. The second author wrote the chapter based on Wigram's notes, reflections and original publications on the subject.

Two international survey studies were also included, because additional information on music therapy assessment tool for ASD were extracted from them. The results from literature search will be presented in the next chapter.

3 RESULTS

Instruments that were collected to represent the medical context for assessing and diagnosing ASD will be listed and presented in the table by their common features and relationship between their main characteristics. After presentation of the first set of data from the medical context, the other set based on common features of the instruments in the first table will be presented. The other set of data is the music therapy context of assessing ASD. The selected instruments were coded by the model of lower-higher level of abstraction from the manual for content analysis that suggests that text should be analysed by determining obvious features, and that will narrow down their content to more specific information (Erlingsson & Brysiewitcz, 2017). Findings will also be explained textually with additional theory section. This step was necessary for understanding and integrating theoretical knowledge as an important part of the integrative review (Cooper, 1989), because it provides an overall picture necessary for understanding of each context.

3.1 Data from the medical context

ABC- Autism Behavior Checklist (Krug, Arick, & Almond, 1980)

ADI-R Autism Diagnostic Interview-Revised (Lord, Rutter, & LeCouteur, 1994)

ADOS-G- Autism Diagnostic Observation Schedule-Generic (Lord et al., 2000)

ASD-DC- Autism Spectrum Disorders- Diagnosis for Child (Matson & Gonzalez, 2007)

ASEBA- The Achenbach System of Empirically Based Assessment, Preschool Forms and Profiles (Achenbach & Rescorla, 2000)

BISCUIT– Baby and Infant Screening for Children with Autism Traits- Part 1 (Matson, Boisjoli & Wilkins, 2007)

BFI- Behavior Function Inventory (Adrien et al., 2001)

BOS- Behavior Observation System (Freeman, Ritvo, Guthrie, Schroth & Ball, 1978)

BSE-R- The Revised Behavior Summarized Evaluation (Barthelemy et al., 1997)

CARS- Childhood Autism Rating Scale (Scholper, Reicher & Renner, 1988)

CBCQ- The Children´s Social Behavior Questionnaire (Luteijn, Jackson, Volkmar & Mindreaa, 2000)

3DI- Developmental and Diagnostic Interview (Skuse et al., 2004).

DISCO 9- Diagnostic Interview for Social and Communication Disorders- Ninth Edition (Wing, Leekam, Libby, Gould & Larcombe, 2002)

GARS- 2- Gilliam Autism Rating Scale- Second Edition (Gilliam, 2006)

M-CHAT- Modified Checklist for Autism in Toddlers (Robins, Fein, Barton & Green, 2001)

PDDRS- Pervasive Developmental Disorders Rating Scale (Eaves, 1993)

SRS- The Social Responsiveness Scale (Constantino & Gruber, 2005)

STAT-Screening Test for Autism in 2-yeat Olds (Stone & Ousley, 1997)

3.1.1 Graphical presentation of the content analysis of data from the medical context

Table 1. Content analysis of data collected from the medical context

TABLE	PURPOSE	PURPOSE	FORM	FORM	SOURCES	SOURCES	SOURCES	BEHAVIOR	BEHAVIOR	BEHAVIOR	BEHAVIOR	BEHAVIOR	PSYCHOMETRIC
	EVALUATION	DIAGNOSING	QUESIONAIRE/ RATING SCALE	DIRECT CLINICAL OBSERVATION	CAREGIVERS/ TEACHERS	MEDICAL EXPERTS	CHILD	SOCIAL	EMOTIONAL	COGNITIVE	SENSORY	COMMUNICATION	RELIABILITY
ABC	+		+		+	+		+		+	+	+	r=0.94
ADI-R		+	+	+	+	+	+	+		+	+	+	r=0.84-0.93
ADOS-G		+	+	+	+	+	+	+	+	+	+	+	MKw= .78
ACD-DC	+		+		+			+	+		+	+	Kw=0.77
ASEBA	+		+		+			+	+	+	+	+	r=0.85
BISCUIT	+		+		+	+		+	+		+	+	0.97
BFI		+	+	+		+	+	+	+	+	+	+	Kw>0.60
BOS	+		+	+		+	+	+	+	+	+	+	0.84
BSE-R	+	+	+		+	+	+	+	+	+	+	+	0.97
CARS	+	+	+		+			+	+	+	+	+	r=0.73-0.82
CSBQ	+		+		+			+	+	+	+	+	ICC= .83
3-Di	+		+		+	+		+	+	+	+	+	0.86
DISCO		+	+					+	+	+	+	+	0.75
GARS-2	+		+	+	+	+	+	+	+	+	+	+	0.64-0.83
M-CHAT	+		+		+			+	+	+	+	+	0.85
PDDRS	+		+		+			+	+	+	+	+	.75-.89
SRS	+		+		+			+	+	+	+	+	.93-.97
STAT	+		+	+	+	+	+	+	+	+	+	+	K=0.90

3.1.2 Textual presentation of the content analysis of data from the medical context

The table above represents data (the particular instruments) collected from the medical context of evaluating and diagnosing ASD. The structure and content of the table are based on the logic of identifying the main features of the instruments (coding), and then grouping the collected instruments by their common features. The main features of the instruments are derived both from the obvious structure and from the more sophisticated function of the instruments:

1. The starting point in coding/identifying the main features of each instrument was to understand the purpose of the collected instruments. The first column in the table (the first feature) is therefore coded as "purpose". My intention was to find out whether all of these instruments have both evaluative and diagnostic purpose. By analysing their content, it became obvious that this is the case for some instruments, whereas others belong to either evaluative or diagnostic category. According to what their purpose is, the instruments are therefore coded into two sub-categories: evaluative and diagnostic.

2. Furthermore, I intended to find out, in understandable and accurate terms, how these instruments work and which form of measuring approach of the behavior they use. I have found two forms of measuring to be the most dominant: the direct (clinically observing the child), and indirect (using rating scales and questionnaires). In the table above this common feature is coded as "form," with two sub-categories "indirect" and "direct."

3. I was further interested in distinguishing who are the sources of valuable information about the child that these different instruments are using. Therefore the next feature/the next column is coded as "source." Here I have identified three different sources, and these are then coded in the table as three sub-categories: child, caregivers/teachers, and medical experts.

4. I was then interested in finding out which aspects of the behavior are these instruments actually measuring. The next feature/column in the table is therefore coded as "behavior". I have identified five different aspects of behavior that the instruments are measuring: social, emotional, cognitive, sensory and communicative, and these are coded as 5 sub-categories in the table.

5. Finally, I wanted to find out about the psychometric value of the chosen instruments – their validity and reliability. The last feature/the last column in the table is therefore coded as "psychometric value."

3.1.3 Theoretical perspectives in the selected instruments (medical context)

The classification and understanding of autism is an ongoing process. In the 1990's, diagnostic categorization of Pervasive Developmental Disorders (PDD) by the American Psychiatric Association (APA) and World Health Organisation (WHO) of the "autistic continuum" included "Autistic Disorder, Asperger Disorder, Rett Disorder, and Childhood Disintegrative Disorder" (Luteijn et. al., 2000, p. 317). These disorders displayed common behaviors that were categorized as the triad of impairments (Luteijn et al., 2000).

A critical change in the conceptualization of the behavioral characteristics that will be measured in the future was found to be presented in theoretical frames of medical model, but since this change dates from the year 2014, it is yet unclear how this will change the future instruments, since none of the instruments that I have collected was made after this change. In 2014, in the new edition of the DSM-V, the autism is considered as a one-dimensional category and does not include subcategories presented above and the behavior that was measured as triad of impairments was reduced to only two impairments: social communication/interaction and restricted and repetitive interest (Adams & Matson, 2016, p. 7). The trait of imagination will be omitted from the diagnostic traits of future instruments for evaluation and diagnosing of ASD, and only the behavioral impairments will be measured (Adams & Matson, 2016). The effectiveness of these changes is still a topic of debate among experts from this field.

Even though other medical disciplines like neurology and genetics are trying to develop instruments that can accurately diagnose autism, the behavioristic approach is currently rooted within "developmental psychopathology perspective" (Klin, Saulinier, Tsatsanis, & Volkmar, 2013, p.772).

3.1.4 Purpose

The purpose column is showing whether a certain instrument is used for screening/evaluation for ASD, or for diagnostic purposes. From the total of 18 instruments that are presented in the table, six have the diagnostic purpose (ADI-R, ADOS-G, BFI, BSE-R, CARS, DISCO,); twelve instruments have the screening purpose (ABC, ACD-DC, ASEBA, BISQUIT, BOS, CSBQ, 3-D, GARS-2, M-CHAT, PDDRS, STAT).

Although the "golden standard" of diagnostic instruments for ASD consists of combining the multiple sources (parent, and/or teacher report) together with direct observation and diagnostic instruments, the reason for using screening instruments is of a practical nature (Constantino & Gruber, 2005). The purpose of general screening for developmental disorders

is to target the children at risk in general population, whereas targeted evaluation instruments, presented in the table above are used for children who showed warning signs in general assessing (Gardner, Campbell, Bradley, & Murphy, 2016). For the population of children that has been detected in general screening assessing, the thorough diagnostic evaluation is needed (Gardner et. al, 2016).

Even though assessment instruments cannot determine with certainty if a child has ASD, the psychometric values of instruments, such as reliability, are strong. This means that children that do score as potentially having ASD during the assessment process often get this diagnosis confirmed after the direct observation by the medical professionals (Gardner et al., 2016). The assessment instruments also have the purpose of delivering the preliminary results based only on the parents/teachers reports that strongly indicate the presence of ASD traits, without necessarily having to examine the child directly (Gardner et al., 2016). Instruments for diagnostic purpose measure behavioral traits for purely diagnostic purpose, in other words, they classify whether the behavior of the child is on the autistic spectrum (Gardner et al., 2016).

3.1.5 Form

The selected instruments can have a succinct (indirect), or comprehensive form (direct) (Constantino & Gruber, 2005). In the table above, instruments with the succinct/indirect form are: questionnaires (M-CHAT, SRS, SCBQ), checklists (ABC, CARS), rating scales (ACD-DC, ASEBA, BISQUIT, PDDRS), and interviews (3-DI, DISCO).

The common characteristics of these succinct instruments are that they do not take much time to fill out, and that the raters (persons who rate the child) are often persons who in fact are in most frequent contact with the child, for example, the child's parents and teachers. However, the instruments with the succinct/indirect form can also be used by medical workers (psychiatrists, psychologists) for the same purpose. When instruments for general screening are used, the raters are usually the child's family members, whereas the instruments that are developed for targeted evaluation, such as diagnostic interviews, require an educated investigator, since the answers are translated into a scaled coding system, which only trained professional can fill-out (Leekam, Libby, Wing, Gould, & Taylor, 2002).

The screening instruments are frequently included in the comprehensive diagnosing because they provide clinicians with the overall picture of a child's functioning during a longer time. The questionnaires and rating scales aim to measure the child's functioning over the longer period, and the reactions in a variety of different situations that are not possible to simulate

during diagnostic observation (Leekam et al., 2002). For example, it is not possible to determine during the observation how the child reacts on the changes in routines, like going from home to school, eating habits and other important indicators of behavioral dysfunction.

The instruments with comprehensive form also include direct observation of the child by the medical professionals combined with questionnaires, interviews, or rating scales. These instruments are ADI-R, ADOS-G, BFI, BOS, BSE-R, GARS-2, STAT.

The comprehensive/direct form of diagnostic instruments includes direct observation of the child in a variety of different situations that are simulated in a clinical setting, in order to determine whether the child's score will meet the diagnostic criteria (Klin et al., 2013). The possible simulated situations include activities like free play, directed play, cognitive tests, speech evaluation and the reaction of a child on the overall variety of situations and different people involved in the process (Klin et al., 2013).

3.1.6 Sources

The *source* column presents different sources (individuals) that the selected instruments include in the evaluation process. These sources may be defined as persons from child's ecological environment (parents/teachers), or the clinical environment (trained medical professionals). In other words, the source column shows whether the information about the child is gathered in the ecological, or clinical setting, or by combining these two. From eighteen instruments, five instruments use all of the sources presented in the table (parents/teachers/day-care workers, medical workers, and child). Instruments for comprehensive evaluation usually operate by collecting the data from either single or multiple sources, and from the environment that is either ecological (home, school) or clinical (different medical institutions where the evaluation occurs) (Powers, 2013, p. 820).

The variables from ecological environment can contribute to discovering strengths and needs of the child with ASD from and within his/her ecological environment, such as evaluation of family dynamics and interaction, evaluation of school system as well as including these sources to provide data on the functioning abilities of the child and the potentials that can rarely be observed in clinical conditions (Powers, 2013).

3.1.7 Behavior

Studying and understanding the etiology (the causality) behind ASD is very complex and includes a multidisciplinary approach (Allen, Robins & Decker, 2008). The cause of the atypical behavior often seen in ASD is considered to be connected to the variety of

neurological disorders (Allen et al., 2008; Williams & Eaves, 2005). These targeted behaviors can also be categorized as challenging behaviors (Leader & Mannion, 2016). There is an extensive domain of measurements that can determine whether a certain behavior can be described as challenging (Leader & Mannion, 2016). The behavior can be measured on molar and molecular levels (Powers, 2013). Molar level measures the predictability and duration of behavior, how long a certain behavior lasts, as well as the physical actions displayed during a certain behavior (Powers, 2013). The molecular assessment measures the ecological context of certain behaviors, such as how often and how intensively certain behaviors happen within different environments (Powers, 2013).

Evaluating the behavior by dividing it into different categories is not always a straightforward process, because these categories are mutually affected and connected, since there is no clear border between "cognitive, conative and affective domains of psychological functioning" (Hobson, 2014, p. 233). Therefore the sub-categories in the table above, under behavior column should also be interpreted in this way. Different aspects of behavior that are presented in the table are measured by every instrument. The behaviour can be evaluated with a simple (succinct) form (with yes or no answer, rating some behavior on the scale of intensity and frequency), or it can be measured by richer description in the comprehensive form of diagnostic evaluation (diagnostic interviews, direct observation).

Social

Social behavior in ASD is characterized by the lack of need for socialization, as well as the difficulty to distinguish people from objects (Hobson, 2014). One of the ways to test the understanding of social situations in the comprehensive forms of evaluation is to test the concept of Theory of Mind (Lind & Williams, 2011).

Theory of Mind is the psychological concept that refers to one's ability to understand the mental state of others and to distinguish them from their own (Lind & Williams, 2011). In the mid-1980s, Baron-Cohen (1985) established that this inability to understand the mental state of others is evident in individuals with ASD. The test was simple: in clinical conditions, the reactions of children on a play of two dolls were observed. The doll Sally represented the positive character and her task was to put the marble into the box and to leave the stage. After that, the other doll, named Naughty Anne took the marble and placed it in another box. The task for children was to answer in which box will Sally search for the marble when she comes back. Unlike typically developing children who knew that being away and not knowing that the marble was replaced, Sally will search for it in the first box, children with ASD failed to

pass the test successfully (Baron-Cohen, 1985). The explanation for why children with ASD fail this test is that they fail to understand that the doll Sally has a mind that differ from their own. They think that the doll knows what they know, and fail to recognize this essential difference in all other social interactions (Lind & Williams, 2011).

In some instruments the overall behavior is measured in the succinct assessment of social behavior. The CSBQ (Luteijn et al., 2000) and the SRS instruments (Constantino, 2000) both use questionnaires/rating scales to evaluate social behavior exclusively as a strong indicator for ASD traits.

The CSBQ instrument measures social behavior through five categories of interaction, including general problems in socialization and understanding of the other person's perspectives. CSBQ also measures social behavior regardless of social interaction, such as acting out, or stereotypes (Luteijn et al., 2000). The SRS instrument measures the social behavior by collecting information from parents, and rating the results by grouping overall behavior into social behavior categories, as is described in CSQB instrument.

Emotional

Emotional detachment from siblings and parents, as well as general lack of empathy are characteristic signs of ASD and can be measured either in the direct observation or in the caregiver's report. (Hobson, 2014) Inappropriate facial emotional expressions and reactions towards not only people but also situations are also often tested (Klin et al., 2013). One such example that can explain the inappropriate facial and social expression could be if the child, in anger, is refusing to engage in play with the siblings, but will instead look at a wall and laugh.

Emotional evaluation such as traditional personality test is not applicable to the ASD population, because of their difficulties in the area of linguistic and narrative skills (Klin et al., 2013). Emotional assessment gathers data through the visual psychological tests or analysing drawings in providing information about the mental and emotional development of a child (Klin et al., 2013).

Free and structured play, both in ecological (environmental) and clinical conditions, is a reliable method for making an overall emotional evaluation (Klin et al., 2013). For example, free play is the way child is using toys, or interacting with family members in ecological, or with medical professionals in clinical environment. Directed play is a sort of play in which a particular tasks are involved (Klin et al., 2013), such as playing a doctor where child is

instructed to be the doctor, or the patient, or instructing a child to assist the medical professional to make a cake by playing in the toy kitchen. Different activities in play can indicate emotional skills, such as symbolic (pretend) play that is often lacking in children with ASD (Hobson, 2014; Lind and Williams, 2011). In the use of instruments with a comprehensive (direct) form like, for example, ADOS, the emotional evaluation of play consists of short series of different situations that involve both known (parents) and unknown (psychologists, or psychiatrists) persons (Klin et al., 2013). For example, it is common for children with ASD to have strong and negative emotional reactions when the environment around them changes (when they are instructed to go to another room, or if a new person approaches them). With this approach it is then possible to evaluate the adaptive behavior, such as emotional reaction of a child to different settings, toys, and persons (Klin et al., 2013).

Cognitive

"Children with severe pervasive developmental disorders display characteristics and appear to operate at the level of the arousal system, with little affective or cognitive processing" (Williams & Eaves, 2005, p. 247). This is displayed in difficulties in understanding abstract and symbolic concepts, meaning that the cognitive abilities of individuals with ASD and real-life skills are very often disproportional (Williams & Eaves). For example, the child can learn to recognize a cat in the picture, but when the same child sees a real cat, she/he will not understand that it is also a cat. To find out how the child operates between learned and real-life situations, psychologists evaluate adaptive behavior, or the child's ability to generalize their learning from the abstract to the concrete across different settings and contents (Klin et al., 2013).

Evaluation of cognitive functions is necessary to determine the level of cognitive functioning and learnt abilities, because mental deficiency is common in ASD (Klin et al., 2013). Unlike some other aspects of behavior (such as communication and social abilities) that can be evaluated easily by non-qualified raters, thorough cognitive tests "may require a highly structured, adult-directed approach within a very bare testing environment to yield the child's "best" performance" (Klin et al., 2013, p. 774). In practical terms, this means that instruments with the indirect form contain some questions that can address cognitive abilities, but the answers to these questions are grouped under the categories such as stereotyped behavior, communication, and social interaction. For example, the questions about object manipulation are connected to a stereotyped behavior and not to cognitive functioning, such as the case

with GARS 2 (Gilliam, 2006), whereas the PDDRS instrument is reducing behaviors to "three internal processes: arousal, affect, and cognition" (Williams & Eaves, 2005, p. 246)

Sensory

Sensory sensitivities are common in children with ASD (Baranek, Parham & Bodfish, 2013). While no individual is the same, and different sensitivities can be challenging, the auditory sensitivities are most common in ASD population (Baranek et al., 2013). Sensory impairments in children with ASD are related to numerous psychological dysfunctions such as depression, anxiety, empathy and social interactions (Hilton, 2011). They can also have a negative effect on learning abilities because repetitive stereotypical nature of ASD sensory defensiveness (involuntary motor movements) is preventing children from focusing on new learning experiences (Hilton, 2011).

Sensory sensitivities are not unique only for the ASD population. They are also common in other developmental disorders (Baranek et al., 2013). However, when evaluating ASD it is found that hyposensitivity (lack of reactions, or delayed reactions) to sensory stimuli is common in ASD, whereas hypersensitivities to the sensory stimuli are often present in other developmental disorders (Baranek et al., 2013, p. 832). The hyposensitivity to audio stimuli (not responding to name, or other loud sounds) is also typical for the population with ASD, and is one of the reasons why ASD is in the beginning often confused with hearing impairment (Baranek et al., 2013).

When observing children during play, children with ASD can display significant interest in investigation of toys in unusual ways, for example they might show greater interest in lining up the toys in specific order, or spinning the wheels of the toy car for an unusually long time, rather than playing. Sensory problems are linked to this kind of behavior in play (Hilton, 2011). Problems with sensory regulation can also cause unusual body sensations and reactions (hand flapping, jumping, screaming), tactile sensitivity, and affect motor functioning by producing involuntary movements (Hilton, 2011).

The distinction between voluntary and involuntary movements is important for the evaluation because it is possible to detect and measure how often involuntary movements appear and how long they last (Hilton, 2011). The frequency and duration of involuntary movements are an indicator of the severity of ASD in the child, because the children who score higher on the autism spectrum usually display a higher presence and longer duration of involuntary movements that are disruptive to the possibility of learning processes to occur (Hilton, 2011).

Communicative behavior/Communication

Speech delay or problems in communication are not present only in ASD. Generally, language delay occurs in 10-15 % of typically developing children and is also present in the population of children with developmental disorders other than ASD (Paul, 2013). What distinguishes ASD are certain aspects that are not always present in the other two previously mentioned groups of children. They include difficulties in verbal communication, pointing gestures, nonverbal communication, reduced responsiveness, atypical vocalizations, deficits in joint attention, lack of eye contact, pretend and imaginative play deficits (Paul, 2013, p. 799-800). Importance of encouraging non-verbal forms of expression is necessary, because it is estimated that only 23,8 % children with ASD aged 2-9 is verbally fluent, whereas 23,8 % uses short phrases that are not considered functional, 23,8% can pronounce single words, and the 28,6% do not use language at all (Anderson et al., 2007).

As it is clearly visible in table 1, communication is the common feature of every instrument. This clearly illustrates that the lack of communication is one of the first warning signs of ASD presence. Assessment of communication skills can be done with the simple questionnaire with yes/no answers that can be used by professionals as well as by the caregivers. The questions address not only the words and their use, because children with ASD sometimes use words that are not appropriate to the situation, or repeat the same word that they heard - echolalia, but they also contain questions about pointing gestures and other forms of non-verbal communication (Anderson et al., 2007). The M-chat that has the purpose of evaluating for ASD, is based primarily on speech and communication evaluation (Robins, Fein, Barton & Green, 2001). The advantage of M-chat is that it does not take long, and the questions are easy to understand and answer. System of rating the answers is 0-2-point scale. The questions in the M-Chat address overall communicative abilities including eye-gaze, pointing gestures, and words (Robins et al., 2001). The simplicity and high metrical value make this instrument very popular and one of the first indicators of early childhood ASD, since it evaluates children as young as 12 months old (Robins et al., 2001). Instruments that have comprehensive/direct form of observation often include presence of speech pathologist (Klin et al., 2013). A detailed evaluation of speech abilities is a reliable indicator for further development, quality of life and the potential cost of care for children with ASD (Anderson et al., 2007).

3.1.7 Psychometric value

ASD is a group of lifelong disorders that share a cluster of similar symptoms (Worley & Matson, 2011). Constant improvement in standardization and revision of evaluation tools has

contributed to their high psychometric value and the need for revised version of previously used instruments (Worley & Matson, 2011). Currently, autism is "one of the most reliably diagnosed disorders in child psychiatry" (Lord & Corsello, 2013, p. 730). In the table we see that all the instruments have high metrical value from 0.75 in DISCO to r=0.94 in ABC. However, the research shows there is a risk of false positives, meaning that there is a higher risk that a child who does not have ASD is diagnosed with it, than that the child who does have ASD goes undetected by diagnostic instruments (Lord & Corsello, 2013).

3.2 Data from music therapy context

After collecting the first set of data from the medical context, analysing their content and extracting the main and common features, I have searched for the instruments from music therapy context, with an idea to follow the same content classification. This was done in order to make sure that the same content and features are analysed from two different perspectives. Since music therapy is not commonly used to evaluate and diagnose ASD (Bergmann, 2018), and since the number of available screening/diagnosing instruments is small, I have found it necessary to search for the relevant data in both research studies and theory. One advantage of utilizing the integrative literature review is that its methodology allows both research-based as well as theoretical-based literature to be included for the analysis (Cooper, 1989). Since the collected instruments from the music therapy field are few and very specific, I have chosen to describe each of them before presenting the interpretation of their main features.

3.2.1 Presentation of data from music therapy context

The data that is presented consists of seven chapter from the book S. Lindahl Jacobsen, E. G. Waldon & G. Gattino (Eds.) (2018) *Music therapy assessment: Theory, research and application* and from two international survey studies on the assessment for ASD in music therapy.

Book chapters:
- Waldon & Gattino (2018). "Assessment in music therapy: Introductory considerations"
- Waldon, Lindahl Jacobsen & Gattino (2018). "Assessment in Music Therapy: Psychometric and Theoretical Considerations"
- Gattino, Lindahl Jacobsen & Storm, (2018). "Music therapy assessment without tolls: From the clinician's perspective"

Instruments for assessment for ASD extracted from the book chapters:

- Carpente (2018). "The Individual Music-Centered Assessment Profile for Neurodevelopmental Disorders"
- Schumacher, Calvet & Reimer (2018). "The AQR Tool: Assessment of the Quality of Relationship"
- Bergmann (2018). "The Music-Based Scale for Autism"
- Wigram & Lindahl Jacobsen (2018). "Event-Based Analysis"

International survey studies:

1) Wilson & Smith (2000) "Music Therapy Assessments in School Settings: A Preliminary Investigation"
2) Chase (2004) "Music Therapy Assessment for Children with Developmental Disabilities: A Survey Study"

Unlike the four designed tools that were extracted from the book chapters (in the table below they are coded as AQR, EBA, IMCAP-ND, MUSAD), tools that were extracted from the studies are not designed by individual therapists. They represent the population of music therapists that do assess children for ASD, but without using any of the designed music therapy tools. I decided to include these tools, because the literature indicates that a large percent of music therapists use self-created tools to assess for ASD (Carpente, Lindahl Jacobsen & Storm, 2018; Chase, 2004; Wilson & Smith, 2000). Even though they do not have the exact design, they were coded by their common features, as these tools are essential in understanding how and why the 50% of music therapists are using them, instead of already existing, designed music ASD therapy assessment tools (Wilson & Smith, 2000). In the table below, they are coded as MTACD (Music therapy for children with developmental disabilities) and MTASS (Music therapy in school settings).

3.3 Content analysis of the tools from the music therapy context

The data is coded, and its content is analysed following the same procedure that was used to analyse the data from the medical context:

1. Theory: What are the theoretical orientations that were found to be common
2. Purpose of the tools: whether the tool is used for assessing, or diagnosing ASD

3. Form: whether the tool is used for collecting the data from direct interaction, or indirectly through description of the child`s functioning from other sources

4. Sources: What sources (persons) are used to collect information on child´s functioning

5. Domains: What domains of behavior are measured

Coding of the instruments extracted from the selected literature presented above

AQR (Schumacher et al., 2018)

EBA (Wigram & Lindahl Jacobsen, 2018)

IMCAP-ND (Carpente, 2018)

MTACDD (Chase, 2004)

MTASS (Wilson & Smith, 2000)

MUSAD (Bergmann, 2018)

3.3.1 Graphical presentation of the content from the data from music therapy context of assessment for ASD

Table 2. The content analysis of the data collected from music therapy context

	PRUPOSE	PURPOSE	FORM	FROM	FORM	SOURCES	SORCES	BEHAVIOR	BEHAVIOR	BEHAVIOR	BEHAVIOR	BEHAVIOR	BEHAVIOR
	EVALUATION	DIAGNOSING	QESTIONNAIRE	DIRECT OBSERVATION	VIDEO ANALYSIS	CHILD	THERAPIST	SOCAIL	EMOTIONAL	COGNITIVE	SENSORY	COMMUCICATION	MUSIC
AQR	+			+	+	+	+	+	+	+	+	+	+
EBA	+			+	+	+	+	+	+	+	+	+	+
IMCAP-ND	+			+	+	+	+	+	+	+	+	+	+
MTACDD	+		+	+		+	+	+	+	+	+	+	+
MTASS	+		+	+		+	+	+	+	+	+	+	+
MUSAD	+	+		+	+	+	+	+	+	+	+	+	+

3.3.2 Theoretical perspectives of the instruments from the music therapy context

The findings from analysing the content from the music therapy assessment tools in two of the studies (MTACDD, MTASS) indicate that half of the music therapists used self-created, experimenter-designed approaches that are in many cases used differently in each assessment (Wilson & Smith, 2000). Therefore, it is not clear whether there is a presence of continuity in theoretical orientation between music therapists that are assessing children for ASD. However, by looking at individual music therapy instruments that are used for assessment and diagnostic purposes, the theoretical orientations are easier to detect. While the MUSAD theoretical orientation is based on the medical context criteria for diagnosing ASD

(Bergmann, 2018), other theoretical orientations and their continuity are more present in the EBA, IQR, IMCAP-ND. Two most dominant theoretical orientations are present in these tools: developmental psychology and music therapy.

From developmental psychology, the works of psychologists Daniel Stern (1985), Cowlyn Trevarthen and Stephen Malloch (2009), who researched the early interaction between infant and the mother, are the theoretical sources of understanding and interpretation of the behavior in ASD assessment (Carpente, 2018; Schumacher et al., 2018). The findings from developmental psychology research indicate that the first communication between the mother and the baby is based on musical elements and body reactions (Carpente, 2018; Schumacher, 2018). With typically developed infants a natural synchronization of face, voice and body movements occurs (Stern in Schumacher et al, 2018; Trevarthen in Carpente, 2018). However, this is not the case with the children with ASD, since the autism affects the newborn's abilities to learn and to form intra-subjectivity (the concept of the self), and to form a relationship with mother (inter-subjectivity) (Stern in Schumacher et al., 2018). For the successful implementation of the findings from developmental psychology, the approaches from music therapy discipline are used and combined as the other source for theoretical frameworks. The Improvisational Music Therapy (IMT) approach is used in a semi-structural form to assess ASD in children (Carpente, 2018; Schumacher et al., 2018; Wigram & Lindahl Jacobsen, 2018).

Having in mind that ASD is obstructing learning processes in early infancy, children that are assessed for ASD can typically present behavior that is the indicator that these learning processes did not develop in the first years of life (Schumacher et al., 2018). In the assessment, the music therapist is helping the child with ASD to form a relationship with oneself and the therapist (Schumacher et al., 2018). In practical terms, this means that the therapist is understanding the voice and body movements of a child as an attempt to communicate and is helping the child by IMT approach - communicating with the child in the form that the child is capable of in the particular moment (singing, playing drums, jumping) (Carpente, 2018; Wigram & Lindahl Jacobsen, 2018). Different musical elements such as pitch, rhythm, and dynamics can be successfully measured and used to score the level of interaction, creativity, and potential for positive change in the behavior, such as the higher presence of interaction and understanding (Schumacher et al., 2018; Wigram & Lidahl Jacobsen, 2018).

This contradiction in terms, that appears in assessment for ASD with therapeutic approach, is explained by twofold nature of the music therapy assessment: it is detecting pathology in the behavior, while also measuring the therapeutic process and change that occurs within the client's functioning (Schumacher et al., 2018; Wigram & Lindahl Jacobsen, 2018). However, the combination of two theoretical approaches that are used in the assessment of ASD, must combine the values they represent. One value is to have a medical purpose of determining the presence of impairments that indicate that the child needs the treatment (Carpente, 2018). The other value of the assessment is a humanistic one, and is referring to the use of assessment as a therapeutic session that is presenting the child with many different ways of expression and communication (Wigram & Lindahl Jacobsen, 2018). Because the IMT is a creative approach, music therapy assessment tools have a semi-structured form, meaning that the activities are structured, but can also be adjusted in terms of the order, duration and the interest of the individual that is assessed (Carpente, 2018). The IMT is also addressed as creative, client-based approach in the music therapy assessment of ASD (Bergmann, 2018; Carpente, 2018; Schumacher et al., 2018; Wigram & Lindahl Jacobsen, 2018).

Summarization of music therapy theoretical orientations for the context of assessment for ASD:

1) they are based on the field of developmental psychology
2) they are based on the humanistic values of music therapy

3.3.3 Purpose
Music therapy tools have a purpose to:

1) contribute to the more accurate diagnostics of ASD through music assessment of the behavior based on the existing medical diagnostic criteria (MUSAD)

2) help to differentiate between ASD and other developmental disorders by using music therapy assessment tools, when medical diagnostic criteria that were previously used on the child did not provide a precise clinical result (EBA)

3) assess the child for ASD traits by using music therapy tools to provide additional information from the ones in the medical context (AQR, IMCAP-ND, MTACDD, MTASS)

MUSAD

The specific purpose of this tool is to diagnose ASD in adults, but it can also be used for the children population (Bergmann, 2018). The challenge to diagnose ASD in adults with standard diagnostic instruments occurs because of the overlapping criteria between ASD and variety of other disorders and impairments, such as schizophrenia, or intellectual disability (Bergmann, 2018). MUSAD is constructed on the DSM-5 criteria for ASD (Bergmann, 2018). MUSAD consists of 12 semi-structured musical activities that measure communication, symbolic play, motoric abilities, joint attention, general cognitive abilities and other essential aspects of the behavior (Bergmann, 2018). Eighty-eight items of MUSAD instrument measure musical and non-musical behavior based on the ASD symptomatology, by scoring results on the 0 to 3 scale that indicates the severity of the symptoms (Bergmann, 2018). The interaction between the therapist and the client is video recorded, and the behavior is then analysed and coded following the same procedure that is used to diagnose ASD using the ADOS instrument (Bergmann, 2018). In testing of the metrical values, the MUSAD scored 10% higher than ADOS instrument that has 85% feasibility, which makes MUSAD useable in comprehensive diagnostic evaluation for ASD (Bergmann, 2018). However, it is essential to mention that even though MUSAD has the diagnostic purpose, it can only be used together with other diagnostic medical instruments, because MUSAD lacks the diagnostic sufficiency (Bergmann, 2018).

EBA

Apart from MUSAD, which is used in the assessment with diagnosing purpose, other music therapy instruments are used mostly for assessment for ASD in children. The EBA, for example, can be used for differentiation between ASD and other developmental disorders that share clusters of symptoms with ASD (Wigram & Lindahl Jacobsen, 2018). Unlike MUSAD, which is designed based on the medical criteria for diagnosing ASD, the EBA is using music therapy assessment criteria to measure ASD traits (Wigram & Lindahl Jacobsen, 2018). EBA combines assessing the child's musical behavior in the music therapy session and through video analysis (Wigram & Lindahl Jacobsen, 2018). The two behavioral traits that are assessed are child's flexibility and autonomy in the music therapy session (Wigram & Lindahl Jacobsen, 2018). These traits are extracted from Improvisational Assessment Profiles (IAP) (Bruscia, 1987). The reason that the IAP was not coded in the table as a separate music therapy assessment tool, is because only two of the six personality traits from original IAP

tool were integrated and combined with video analysis into the EBA tool that is currently widely used (Wigram & Lindahl Jacobsen, 2018).

In practical terms, when using the EBA tool for the assessment of children for ASD, it is recommended that the child meets with the music therapist for several music therapy sessions that are video recorded (Wigram & Lindahl Jacobsen, 2018). During what seems like a regular music therapy session, the traits of variability and autonomy are tested through music improvisation/interaction (Wigram & Lindahl Jacobsen, 2018). Variability is the trait that describes how creative the child is in the musical expression: can he/she express vocally, or through the use of various musical instruments, can he/she show nuances in terms of dynamics, or rhythm (Wigram & Lindahl Jacobsen, 2018). The variability trait is grouped into five categories: rigid, stable, variable, contrasting and random, and each of these categories can be measured on a 1-3 scale to describe how intensive each level of a particular trait category is (Wigram & Lindahl Jacobsen, 2018). Autonomy trait is the trait that describes the role the child is using to interact with the therapist, meaning that the child can express him/herself as a leader, or as a follower in the music therapy session (Wigram & Lindahl Jacobsen, 2018). Autonomy trait is also categorized into five levels: dependent, follower, partner, leader, resister, and each of the levels can also be rated on a 1-3 scale (Wigram & Lindahl Jacobsen, 2018).

In the video analysis, these traits are analysed through three stages of selective processes through which the music therapist is detecting the most dominant traits in the behavior of the child in order to create relevant information that could be used for external purposes, such as differentiating between ASD and other developmental disorders (Wigram & Lindahl Jacobsen, 2018). Findings indicate that in the cases where the child, otherwise considered to display the pathology of ASD, scores high in properties such as openness and creativeness in musical behavior, it can be an indicator that the child was incorrectly diagnosed with ASD, instead of some other developmental disorder (Wigram & Lindahl Jacobsen, 2018). These findings were based on the assessment of non-verbal musical communication that is not a part of existing medical diagnostics for ASD. Therefore, if the child is showing the ability to communicate through music, and lack of rigidity in the behavior that is typical for ASD, but is otherwise non-verbal, this child should be re-evaluated for some other developmental disorder (Wigram & Lindahl Jacobsen, 2018).

Apart from MUSAD which has the diagnostic purpose and the EBA which has the purpose to differentiate between ASD and other developmental disorders, the purpose of other assessment instruments can be described as twofold: for assessing/evaluating pathologies in the behavior (MTACDD, MTASS) and for measuring change during the therapeutic process (IMCAP-ND, AQR).

MTACDD

In a survey that was conducted to examine the commonalities in the population of music therapists who assess children with developmental disabilities, it was found that five areas of assessment focus are corresponding between these music therapists (Chase, 2004). The five most represented areas of assessment are:

1) Motoric skills: instrument manipulation, dance, body movements

2) Communication skills: musical communication (instrumental and vocal), receptive language

3) Social skills: joint attention, sharing instruments, eye contact

4) Cognitive skills: memory, auditory discrimination

5) Music skills: the ability to match rhythm and pitch, personal music preferences

AQR

The AQR instrument (Schumacher et al., 2018) measures the way the child interacts with him/herself, the music instruments and the therapist, using four scales (Schumacher et al., 2018). Three of the scales measure, on the 0-6 modules, the quality of these interactions/relationships that are grouped in three forms of child´s expression: physical-emotional expression scale (PEQR), vocal pre-speech expression (VQR) and instrumental expression (IQR) (Schumacher et al., 2018). All modules are measured through video analysis. Scale four measures the therapist and intervention (TQR), and has a twofold purpose: it is used to assess if the therapist was successfully reacting to child´s levels of expression and managed to match them in musical and therapeutic interaction and interpretation, and to observe the reactions of a child to the therapist´s approaches (Schumacher et al., 2018).

IMCAP-ND

The IMCAP-ND was created to measure social interaction and play when assessing children for ASD (Carpente, 2018). This tool combines properties of some of the most often used assessment tools in standard diagnostics of ASD, and some of the commonly used music therapy tools for assessing ASD (Carpente, 2018). The IMCAP-ND is assessing behavior through 3 rating scales that measure elements of emotional, cognitive and musical responses separately (Carpente, 2018). The Musical Cognitive Rating Scale (MCPS) measures the cognitive functioning, the Musical Responsiveness Scale (MRS) measures the overall behavior that includes child's personal musical preferences, the ability to successfully understand and perform a specific task and the ability for self-regulation (Carpente, 2018). Elements of play and emotions are measured with Musical Emotional Assessment Rating Scale (MEARS)

The music therapy assessment tools are primarily used in assessing the general level of functioning that can be categorized in properties of pathological behavior and properties of potential (Chase, 2004). This purpose, even though it can be interpreted as twofold, is in music therapy assessment understood as an overall assessment of the child's functioning including impairments, as well as potentials (Chase, 2004). The music therapy assessment for ASD is client-based and user-friendly approach (Carpente, 2018; Bergamann, 2018), meaning that even though it is assessing pathologies of ASD, assessment is often semi-structured, allowing the client a certain level of autonomy that can provide information including personal preferences and potentials (Chase, 2004). They also measure the quality of interaction and a level of engagement between the child and the therapist (Wigram & Lindahl Jacobsen, 2018; Schumacher, Calvet & Reimer, 2018). In this process, both personal musical preferences from the client and the assessment approach that therapist use are integrated to provide the assessment tool that can measure each client based on his/her preferences in a particular situation (Chase, 2004).

3.3.4 Form

Music therapy assessment for ASD often consists of several music therapy sessions, which are then assessed and rated by criteria of a particular instrument (Wigram & Lindahl Jacobsen, 2018; Schumacher et al., 2018).
Despite a large number of music therapy assessment tools, there is a lack of standardization among these tools worldwide (Chase, 2004; Carpente et al., 2018; Wilson & Smith, 2000).

MTASS

The data from a survey that was conducted by Wilson and Smith in the USA (2000) among music therapists who are assessing children with developmental disabilities in school settings, revealed that 49 % of music therapist used "named", or "titled" music therapy assessments, whereas the 51% "used experimenter-designed, original assessment tools" (Wilson & Smith, 2000, p. 95).

Based on the data from this study, it is logical to define the form of music therapy assessment as:

    1) Named

    2) Experimenter-designed

The "named", or "titled" assessments represent the instruments that have been constructed with an intention to be used in a certain context, for example, to assess children for ASD (Wilson & Smith, 2000). These tools are often applied to a larger number of people and were in some form metrically tested and recommended for further use (Wilson & Smith, 2000). However, in practice the experimenter-designed instruments are also used for assessing the same population (Wilson & Smith, 2000).

3.3.5 Sources

None of the collected music therapy assessment instruments operate without the child itself being directly evaluated. The child is, therefore, the primary source of information in music therapy assessment instruments for ASD. Music instruments, even though they are objects, are also used as a source of information in the process of assessment. They are used to determine different traits in the behavior (Bergmann, 2018; Carpente, 2018). Properties of music as stimuli such as pitch, rhythm, dynamics, as well as various musical instruments are all used as the sources for gathering information about the child's behavior (Wilson & Smith, 2000). Percussion instruments are often used for the assessment of cognitive, motoric and sensory functioning, whereas voice and melodic instruments are commonly used for the assessment of the emotional and communicational behavior (Bergmann, 2018; Carpente, 2018; Schumacher et al., 2018). It is important to notice that this is just a generalization of their purpose, and that the IMT approach to assessing ASD allows the use of variations in which different music instruments can have different purposes, depending on a child's personal interest and the way he/she operates a certain instrument (Carpente, 2018; Wigram & Lindahl Jacobsen, 2018). The information about the child is always collected in direct contact, as well as from the combination of the questionnaires filled by caregivers, and checklists

(Chase, 2004). They are used to collect specific information that can provide a better understanding of the child before the first encounter with the therapist takes place (Chase, 2004). The source that is also commonly used is a recording of the visual and audio interaction, so that therapist can analyse the interaction and score it according to the assessment/evaluation instrument that has been used (Carpente, 2018; Scumacher et al., 2018; Wigram & Lindah Jacobsen, 2018). In this way both musical and non-musical behavior is measured (Carpente, 2018).

3.3.6 Domains of the behavior

The approach that is commonly used in measuring the behavior is Improvisational Music Therapy (IMT) (Bergmann, 2018; Carpente, 2018; Schumacher et al., 2018; Wigram & Lindahl Jacobsen, 2018). In practical terms, the child has freedom of expression within the semi-structured musical frame that contains elements of repetition and patterns of structure. This means, that for example, if the cognitive behavior is measured through activity in which the child should repeat a particular rhythmical pattern, but the child shows more interest in exploring other properties of musical interaction, the music therapy assessment tools provide the freedom of flexibility. In this way, through uninterrupted interaction, the activity can become music improvisation through which other properties, such as creativity can be measured (Schumacher et al., 2018; Wigram & Lindahl Jacobsen, 2018). That is one of the reasons why the behavior is assessed both directly through interaction, and through video analysis, so that interaction can continue uninterrupted by the static structure of the assessment tool, that only can for example measure cognitive ability through one particular activity. In the analysis part, the behavior can be categorized as social, cognitive, emotional, sensory, communicational and musical. In the analysis of the behavior, three characteristics are measured:

1) Overall, descriptive behavior

2) Frequency of the behavior

3) Duration of the behavior

(Bergmann, 2018; Carpente 2018; Chase, 2004; Gattino et al., 2018)

4) Quality of the relationship that is established between the therapist and the child (Schumacher et al., 2018; Wigram & Lindahl Jacobsen, 2018).

The assessment can, therefore, be understood both in terms of quantity, such as measuring how many times did the child press the piano key, or as describing the quality of the interaction such as involvement, joint moments, laughter (Carpente, 2018).

The following description illustrates the six categories and how the various tools are utilized under each one.

Social

Social behavior is measured through the child´s ability to form a relationship through music interaction with the therapist (Bergmann, 2018; Wigram & Lindahl Jacobsen, 2018). It is also measured through engagement and joint attention in music activity (Bergmann, 2018). Joint attention is measured as passive, or active (Bergmann, 2018) depending on whether the child is engaging in the activity (for example playing the piano together with the therapist in the case of active joint attention), or if the child is just receiving music stimuli without any engagement (passive). Activities like turn-taking through music can also provide information about the child's awareness of the social context, meaning whether the child is showing the understanding that the therapist is present or not (Bermann, 2018). The relationship assessment is perceived from both the intra-subjective and inter-subjective ability to form a relationship through music, meaning that the child is encouraged to form the connection with him/herself (intra-subjective), and connection with therapist (inter-subjective) (Schumacher et al., 2018). Findings from the use of AQR tool indicate that the change in the concept of understanding situation and engagement is possible even for the children that do not display any self-awareness (no intra-subjectivity, the understanding of the self) (Schumacher et al., 2018). In the population of children that score low on intra-subjectivity it is often the case that many stereotypical (sensory) and affective (screaming, aggression) behaviors are present (Schumacher et al., 2018). This is explained by the lack of understanding of the self and the surroundings (Scumacher et al., 2018). In the AQR tool, this is described in functioning on modus 0, 1, or 2 (Schumacher et al., 2018). If the therapist manages to regulate affect of the child by tuning in to the child's expression (music attunement), or by using music to contrast or to regulate affect, the child can suddenly start to engage in the joint activity with the therapist for a short period of time (Schumacher et al., 2018). In other words, the intra-subjectivity and inter-subjective manifestations are measured to be more of a dynamic process in which the child can show understanding of the self and the therapist if he/she is helped with the affect regulation through the music therapy interventions (Schumacher et al., 2018).

Emotional

In music therapy, challenges in the assessment of ASD can occur when assessing emotions, during measuring and coding of the emotions that are expressed with non-musical gestures (Caprente, 2018). In other words, non-musical, but still important parts of the interaction, such as a smile, or a hug also need to be integrated into the overall assessment (Carpente, 2018). The IMCAP-ND tool was created to measure social interaction and play when assessing children for ASD (Carpente, 2018). The IMCAP-ND is a semi-structured tool that provides guidance in terms of how to structure the musical activities that can provoke the emotional responses from the child, but apart from suggesting the A-B-A structure of music, all the other elements (instrument choice, tonality, song choice) are not structured (Carpente, 2018). The emotional reactions are stimulated musically by:

1)   Chords progressions and modulations to measure the child's awareness of different musical tensions, by for example analysing body tension, or facial expressions

2)   Musical, or facial reactions from the therapist as a response to the child's musical initiative (for example, does the child show the expectation that the therapist will react to his/her musical initiative)

3)   Child's personal musical preferences: Does the child continuously show the preference towards a particular (repeating) music stimuli (for example, does the child show a positive reaction to a particular melody, among some others) (Carpente, 2018). Elements of play and emotions are measured with the Musical Emotional Assessment Rating Scale (MEARS) and consist of five targeted areas: attention, affect, adaptation to musical play, engagement, interrelatedness (Carpente, 2018).

Cognitive

Properties of cognitive level of functioning are a standard part of all music therapy instruments for assessing ASD (Chase, 2004). They are included in both named and self-created tools (Chase, 2004). The assessment of cognitive abilities includes assessment of concepts (correctly identifying a particular song with the picture that is a visual representation of that song), memory (memorizing and reproducing the same rhythmic pattern), or auditory discrimination (discriminating one music stimulus from another) (Chase, 2004). Music therapy assessment also includes object manipulation, like repeating the same key on the piano, or understanding and operating drums, or other rhythmical instruments successfully (Chase, 2004). Cognition is also related to motor functioning, and therefore motor skills are

often assessed as a part of cognitive functioning (Chase, 2004). Fine motor skills are assessed by, for example, using a finger puppet, child's ability to turn the page of the book, or to play a glockenspiel; whereas the gross motoric skills are assessed through the ability to imitate the simple choreography from the children songs (pointing body parts, jumping, clapping) (Chase, 2004).

Sensory

Assessment of sensory functioning includes measuring the reaction to different types of musical stimuli like vibration, pitch, dynamics, as well as body manifestations like dancing, jumping, stereotypical behavior (Bergmann, 2018). Negative reactions to certain stimuli are however not perceived as something wrong but are instead interpreted as revealing information about communicational and personal preference of a child towards one particular stimulus, instead of another one (Wigram & Lindahl Jacobsen, 2018). This is also explained by the child-led approach in music therapy assessment (Carprente, 2018, Wigram & Lidahl Jacobsen, 2018), meaning that if, for example, the child shows that he/she does not like the sound of a piano, and prefers another instrument instead, the assessment will be continued with the instrument that creates the sensory environment that is pleasant for the child.

Body reactions such as particular tactile sensitivities and body restlessness, or mannerism are also possible to assess and regulate at the same time (Carpente, 2018; Schumacher et al., 2018). Tactile sensitivities and interests are measured by the frequency and duration of the time that the child spends with certain instruments, or an activity (Carpente, 2018). In the case where the child is restless due to the sensory overstimulation, the therapist can regulate the affective behavior with music and continue to engage with the child (Schumacher et al., 2018). This regulation is also analysed as an important element of change in sensory functioning (Carpente, 2018; Shumacher et al., 2018).

Dance is often used to assess sensory and levels of the motor function where the child´s ability to synchronize the body movement to the music, rhythm and the therapist is assessed (Chase, 2004; Bergmann, 2018).

Communicative

For the assessment of communication in developmental disorders, where communication deficits are common, the non-verbal, interactive method is used (Bergmann, 2018; Chase, 2004; Schumacher et al., 2018; Wigram & Lindahl Jacobsen, 2018). Theoretical frames for this approach are rooted in research from developmental psychology of infants and

attachment theory (Carpetnte, 2018; Schumacher et al., 2018). This means that the child's verbalization, vocalization, or instrument manipulation are interpreted and understood as communicational attempts, recreating the context of early mother-infant interactions (Carpente, 2018; Schumacher et al., 2018). Practically, the role of the therapist is to encourage these attempts and to respond to them. After the therapist's recognition of child's initial actions as communicational, the child's reactions are measured and rated (Schumacher et al., 2018). In other words, if the child is for example turned away from the therapist and is only expressing him/herself through unarticulated vocalisation (high pitch scream, or some similar vocalisation), the therapist will respond musically to this vocalisation by approaching and facing the child to meet this vocalisation as communication that is directed at the therapist. This interaction will be analysed in video analysis to find out if there is a change in the child's behavior after this interaction (whether the child has understood that the therapist is communicating to the child). The VQR scale is measuring vocal pre-speech expression in microanalysis to detect different types of vocalization that a particular child is using, as well as the intrapersonal and interpersonal relationships (Schumacher et al., 2018). Apart from vocal interactions, dialogue is also assessed with musical instruments. The example for this we can find in the MUSAD instrument that assesses musical dialogue by using two congas (Bermann, 2018).

3.3.7 Metrical values

Despite a large number of music therapy assessment tools, there is a lack of standardized music therapy assessment tools worldwide (Wilson & Smith, 2000; Chase, 2004). Metrical values of music therapy assessment instruments are not strong and often they are not even tested (Carpente et al., 2018; Waldon & Gattino, 2018; Wilson & Smith, 2000). The client-based approach to assessment in music therapy can offer unique information about the client (Caprente, 2018; Wigram & Lindahl Jacosen, 2018). The child-led approach can also be an obstacle regarding the standardization of music therapy assessment tools and a challenge for metrical values (Chase, 2004; Waldon & Gattino, 2018; Wilson & Smith, 2000). It is also the reason why music therapists are finding it challenging to use some of the existing instruments (Wilson & Smith, 2000). Reliability and validity of many existing instruments are not tested, and this is one of the most important reasons why the majority of music therapists decide to use self-created assessment instruments (Wilson & Smith, 2000). Since the metrical value cannot be described as a common feature of music therapy assessment instruments, it is only

mentioned for the purpose of continuity in presenting and comparing two contexts of the assessment for ASD (medical and music therapy).

3.3.8 Musical behavior

Musical behavior is one new feature that was detected and one new column that was added in table 2 because this feature was not found in the content of data from the medical context. This is the musical behavior feature/column that is added as the content that is found only in the second part of the data from the music therapy context.

Content of music in the selected assessment instruments (and approaches) is twofold:

1) it can measure behavior through music by scoring only behavioral features

2) it can assess musical behavior (Wilson & Smith, 2000; Chase, 2004; Bergmann, 2018; Carpente 2018; Schumacher et al., 2018; Wigram & Lindahl Jacobsen, 2018).

This twofold nature of music therapy assessment instruments can be explained by the context and the nature of music therapy as a discipline (Waldon & Gattino, 2018). In the case of ASD, the clinical perspectives of assessing pathologies of the behavior are common features of all the instruments that are presented. The other content that is measured derives from music therapy's humanistic nature that also detects and measures properties such as quality, relatedness, feelings, expressions and other properties of interaction (Waldon & Gattino, 2018).

In this chapter, the data from both medical and music therapy context of assessment for ASD was presented, evaluated and analysed following the research steps of integrative literature review (Cooper, 1989). In the next chapter, these two contexts will be integrated through discussion and comparison of the common features that were found in the content analysis. This integration will allow the overall understanding of the data, in order to generate new knowledge that is necessary for addressing the research question of this study.

4 DISCUSSION

The presentation of results from medical and music therapy context of assessing for ASD will be summarized in a form of new knowledge that is synthesized through literature review. This will be in a form of discussion on findings from the results chapter. I will compare these two contexts based on the findings, by three categories:

1) Understanding of ASD: here the theoretical knowledge upon which the instruments are built will be synthesized. This will be discussed as an understanding of ASD in medical and music therapy contexts. The behavior column with its sub-columns will reflect on the differences in behavior evaluation/assessment approach

2) Evaluative domains: how behavior is assessed and interpreted in both of the contexts will be discussed

3) Overview of both contexts: finally, the product of measurement that is the overall picture of the child's functioning in these two contexts will be graphically and textually presented

4.1 Understanding of ASD

As mentioned in chapter three, for understanding the difference between how ASD is evaluated in the medical context and how it is assessed in music therapy, it is necessary to include their theoretical frames. In other words, do they differ in the ways they conceptualize the behavior they measure. Based on the data that was collected in the previous chapter, theoretical frames present understanding of ASD upon which instruments are found to be different.

Theoretical frames of medical and music therapy context are pointing towards different sources of knowledge and interpretation of human nature. My understanding of the medical context is that, since it is rooted in developmental psychopathology perspective (Klin et al., 2013), the pathology of the behavior is measured. When we look at table 1, we see that from 18 instruments that are presented, only six (ADI-R, ADOS-G, BFI, BOS, GARS 2, STAT) include direct observation of the child. From six instruments that are presented under the diagnostic purpose column, (ADI-R, ADOS-G, BSE-R, BFI, CARS, DISCO) only 3 include direct observation of a child (ADI-R, ADOS-G, BFI). The other three (BSE-R, CARS, DISCO) use interview, questionnaire, or rating scale collected from the child's parents or teachers to diagnose the child with ASD. In other words, the child does not even need to be present in the diagnostic process.

In the 2014 diagnostic manual (DSM-V) the creativity trait has been omitted from ASD (Adams & Matson, 2016). This only confirms the necessity in the medical context to narrow down ASD to the more obvious pathological traits. The reasons for this are not explained in the literature, but it might be that the growing number of children that are diagnosed with ASD is larger than the number of children diagnosed with other developmental disorders that were previously included under ASD (Asperger Disorder, Childhood Disintegrative Disorder, and Pervasive Developmental Disorder), and therefore, the necessity of focusing strictly on the pathology of autism demands the creativity trait to be omitted for faster and more precise diagnosing of autism (Adams & Matson, 2016).

Music therapy assessment context has grounds in developmental psychology (Carpente, 2018; Schumacher et al., 2018). The therapist is trying to understand the child, taking the role of a parent/mother recreating the early infancy interaction by creating a situation of understanding and interaction (Schumacher et al., 2018). However, the music therapy assessment is also evaluating the presence of ASD impairments (Bergmanm, 2018; Carprente, 2018; Wigram & Lindahl Jacobsen, 2018). Therefore, it is logical to assume that impairments in the behavior can be measured with other approaches apart from the medical, developmental and psychopathology approach.

The assessment conducted within music therapy context always involves the presence of the child. If we look at table 2, we can see that all the presented tools have a child as a primary source of information for music therapy assessments. Even in the case of different theoretical orientation of the individual therapists who use the experimenter-designed instrument for the assessment, there was a 100% consensus that a child is always present in the assessment (Chase, 2004).

My understanding of these two contexts is that they differ in terms of what they measure in the medical context, or who they measure in a music therapy context. More precisely, I understand the medical context as a model that evaluates the presence of autism, or pathology, whereas music therapy context assesses the presence of autism in a child. If we compare these contexts, we can see that to measure and diagnose autism successfully in medical terms, the presence of a child is not even necessary, as long as the design of rating scales, or questionnaires has passed the metrical testing and is proved to be an accurate source of measurement of autism. This is the main distinction between the medical and humanistic approach in these two contexts: medical one is observing the health as the absence of

pathology; therefore, the presence of the child is not necessary, as long as pathology can be successfully measured indirectly. Humanistic approach in music therapy is clear in observing the child, where his/her human nature is central, and in understanding health in a broader context of wellbeing and functioning within the particular condition. Therefore, the features such as quality of relationship (Schumacher et al., 2018), or leadership within the relationship (Wigram & Lindahl Jacobsen, 2018) are assessed as well.

In music therapy, the child is assessed primarily as an individual that can have traits of ASD impairments within certain aspects of behavior (Wigram & Lindahl Jacobsen, 2018). The reason for this we can find in humanistic properties of music therapy assessment, such as that it is child-led, music-centered, as well as a relationship-based (Caprente, 2018). In other words, the child is always present, because the child is the one that is being assessed for determining if it has traits of ASD behavior. Music therapy assessment is approach that can, therefore, be understood as holistic, assessing the child both within pathology and outside of pathology, as a unique individual (Wigram & Lindahl Jacobsen, 2018).

4.2 Evaluative domains

Based on the theoretical frames of these two contexts, the distinction was made between the behavior that is measured. My interpretation is that this distinction can be described as evaluating the behavior in the medical context and assessment of behavioral domains in music therapy context. I will now compare how behavior features differ in these two contexts.

4.2.1 Time

If we look at these two contexts through the ways in which their tools operate, we can see that they also differ in the way the behavior can be measured and rated. My understanding is that one of the main differences is the time that is invested and the richness in the interpretation of data that they collect. In the medical context, we can see that there is a strong presence of questionnaires, checklists and rating scales. This way of collecting information usually does not take a long time. The succinct form of instruments - questionnaires, rating scales - takes 5-20 minutes, depending on the tool (Worley & Matson, 2011). The tools with comprehensive form take 20-30 minutes of observation combined with the additional information from other sources (information from parents gathered through succinct form) (Worley & Matson, 2011).

The information gathered through succinct form of assessment often rates behaviors with yes/no answers or rates a particular type of behavior on the numeric scales. These instruments collect the information about how often a particular behavior appears, if it appears at all, and

how long it lasts, by grouping behavior into molar and molecular levels (Powers, 2013). However, based on the medical criteria, the questions are constructed to measure pathology in the behavior in a short time frame. This is the reason why they can only provide the answer if some behavior is considered to be a pathological manifestation of ASD, or not, on a simple scale, or through yes/no answers. Apart from that function (measuring the pathology in the current time frame), the behavior is no longer observed as the manifestation of anything else (possible resources that a particular child has).

If we look at the music therapy assessment tools, we can see that they have no specific time duration for completing the assessment tasks. In the description of EBA assessment (Wigram & Lindahl Jacobsen, 2018), it is mentioned that 2-3 sessions that are between 20-40 minutes long are necessary for the first part of the assessment. The other part of the assessment is done through the video analysis of the session (Wigram & Lindahl Jacobsen, 2018). The time duration of the video analysis part of the assessment is not presented, but it is logical to assume that it takes many hours to analyse material that is collected in the sessions. The time that is used for the operation of the other three instruments (AQR, MUSAD, IMCAP-ND) is not presented either. By analysing the content of AQR, MUSAD, IMACP-ND tools, it was found that they use various different music activities for the assessment: playing musical instruments, singing, dancing. We can conclude that they take a long time for assessment of the child. In the video analysis of AQR, MUSAD and IMCAP-ND tools, the various scales that measure different domains of behavior also indicate that the assessment through video analysis takes much longer time than the medical context in which video analysis was not mentioned as a part of the procedure in any tool. Music therapy assessment also offers a chance for a child to become familiar with the assessment situation through several sessions (Wigram & Lindahl Jacobsen, 2018). In that way, the child is given the opportunity to be assessed in a manner that is potentially less stressful, by becoming more familiar with the environment, therapist and the tasks. At the same time, several assessments sessions are providing a child with the opportunity to improve in his/her performance of the specific tasks. This is one more indicator of a humanistic approach in music therapy assessment that does not aim only to measure the current level of functioning, but also the ability to adjust and change.

4.2.2 Environment

The child's environment does not merely refer to the physical environment. I address the idea that even if a child is first evaluated in a certain room by the medical context, and after that

with the music therapy context, this room is not the same environment. With this, I do not mean that the presence of musical instruments in the room changes the physical environment, but rather that the music stimulation that occurs changes the sensory environment that the child receives. Based on the knowledge from findings of sensory impairments in ASD, the most common one is hyposensitivity (not reacting) to audio stimuli (Hilton, 2011). In that sense, I would describe the medical context as neutral, or potentially negative sensory environment, because the only audio stimulation approach is to use words when addressing the child. If the child does not respond to the words, the medical context does not offer any other way of stimulus to initiate the audio-reaction from the child. In a music therapy context, the variety of different sensory stimulating approaches is used in musical interaction, such as different frequencies, vibrations (Bergmann, 2018, Carpente, 2018; Chase, 2004; Schumacher et al., 2018). The variety of audio stimuli is used in order to activate a response from the child. Therefore, if hyposensitivity to a particular audio stimulus occurs, the music therapist will test some other audio-stimulating approach, in which the child can communicate (Schumacher et al., 2018). That is why I understand music therapy assessment as a potentially positive environment in which different auditory stimulations are used to address auditory preferences of each child individually.

The observable sensory deficits, such as involuntary movements (sensory impairments such as hand flapping, biting, tantrums) have a negative effect on learning abilities (Hilton, 2011). When assessing for ASD, these sensory impairments are often expected to be seen in the behavior (Bergmann, 2018). In the medical context, it was not mentioned that the behavior (in direct clinical observation) is regulated during the evaluation. In music therapy context the processes of assessment and regulation occur simultaneously (Schumacher et al., 2918; Wigram & Lindahl Jacobsen, 2018). The reason why the intervention does not happen in the medical context is based on the fact that the assessment tools do not include therapeutic interventions as a part of their assessment design. Based on this knowledge, we could also ask the question: is the knowledge that is collected in the environment of medical context same as the knowledge created in the environment of music therapy context? In other words, if we do not regulate the child's sensory impairments that we know are disturbing the learning processes, should we not also be concerned that the information about what child potentially really can, is an accurate presentation of whom he/she is? We can also ask if the sensory challenges can be regulated effectively by the person (medical professional, or music therapist) involved in the assessment process. We know that in assessing for ASD, it is

common to expect the warning signs for ASD that were the reason for the initial concern that led to the assessment situation. The child that has emotional difficulties commonly found as a warning sign for ASD can struggle with new situations, such as meeting new people and going to new places (Klin et al., 2013, p. 780). In that sense, both medical evaluation and music therapy assessment already have negative element for a child's performance, because they include both new persons and new environment. If we then do not regulate the affective behavior produced by this new situation, I would argue that the child's performance would be even weaker than in a normal situation. Even though one can argue that the assessment should determine only the present level of functioning, it is essential to understand that both medical and music therapy contexts include the assessment of learning abilities by presenting the child with variety of different new tasks that are dependent on the learning abilities (for example the child is expected to learn how to manipulate a music instrument). Even more, if we manage both to regulate and to stimulate the potential of sensory interests, we can create a positive learning environment in which child can perform his/her learning abilities in the variety of different tasks.

According to CDC (n.d.), the medical professionals that evaluate for ASD are not occupational therapist, because they work in a care-related context. Music therapists are primarily working in the care-related context (Gattino et al., 2018), so they do have the competence to both regulate and assess the behavior.

4.2.3 Social behavior

In chapter 3, on measuring social behavior in the medical context, we saw that the Theory of Mind (ToM) concept is used to assess and classify the deficits in social functioning (Hobson, 2014; Lind & Williams, 2011). If the child fails to differentiate people from the objects, is not engaging socially and does not understand the situation from another person's perspective, the medical context can only determine that the child is unable to conceptualize in the right manner. This was described in the test with the Naughty Ann doll. The deficit is explained as one more pathological functioning that is commonly present in the ASD population (Hobson, 2014). On the other hand, the AQR instrument (Schumacher et al., 2018) measures the concept of self-awareness (intra-subjectivity) by the way the child engages with the environment and operates musical instruments. In other words, the AQR is measuring if the child is aware of his/her own presence, the presence of music therapist and music instruments in the room, and does the child show the understanding between him/herself, therapist and objects (Schumacher et al., 2018). Children with a lack of self-awareness often

display affective behavior; they have loud vocalization, intensive sensory deficits and are not aware of the instruments (Schumacher et al., 2018). However, if the therapist manages to regulate the affect, by synchronizing musically with the affect behavior (for example to respond musically to the screaming until the child get a sense of the therapist presence), it is reported that by using this technique, children can feel that something or someone else is also present (Schumacher et al., 2018). Children demonstrate this awareness by looking towards another source (therapist, instrument) and even engaging for a short time in a musical activity, showing awareness for the therapist by establishing eye contact (Schumacher et al., 2018).

I would also describe the music therapy assessment as measuring the social capacity of the child. We see that the EBA assessment uses the measure of autonomy and variability to describe two main characteristics through which different behavioral functions are analysed (Wigram & Lindah Jacobsen, 2018). Rather than just assessing, the music therapist is engaging with the child through several sessions of musical interaction to test how strong these traits are, as well to test if they have equally strong presence through all musical properties (Wigram & Lindahl Jacobsen, 2018). Findings from EBA indicate that social behavior in music therapy assessment cannot be described as one state of functioning, but rather through layers of functioning, since, for example, strong presence of autonomy trait in rhythmical interaction does not automatically mean that we will find the same trait in melodic interaction, where child can present more variability (Wigram & Lindahl Jacobsen, 2018).

I understand that social behavior in the medical context is evaluated as a state of being that is in a way described as a static - a child can, or cannot conceptualize properly - whereas music therapy context measures social behavior as a more active state. If we think about the Naughty Ann doll experiment (Hobson, 2014), we can see that it is only through one example that the social capacity of the child is measured. In music therapy assessments, different social traits are assessed and, even more importantly, the change in the social conception is measured as an essential element that indicates that social conceptualization is a dynamic and changeable concept.

4.2.4 Emotional behavior

Emotional behavior is assessed similarly in both contexts with the play as a central activity for assessing emotions (Klin et al., 2013; Bergmann, 2018; Caprente, 2018). The structure is free, includes toys in both contexts, whereas in medical context the drawings are analysed, and in music therapy context it is musical play that is analysed in terms of child's

engagement, adaptive behavior as well as facial and body expressions, like a smile, or a hug (Carpente, 2018). The differences between these two contexts appear in emotional regulation during the assessment. In the medical context, the emotions are not regulated but just evaluated as they appear, whereas, in the music therapy context, the regulation of emotions is a standard process of the therapist-child interaction.

Here again, the nature of both therapy and assessment explores the child's emotional potential by regulating the emotions, and measuring emotional capacity and how it can be regulated (Schumacher et al., 2018). If the regulation process contributes to a better quality of the relationship, this is also measured, and the therapist continues to engage on the higher level (module) of functioning (in the PEQR scale) encouraging the child to engage even further (Schumacher et al., 2018). In these two approaches to the interaction, one with only interacting for the evaluation purpose (in a medical context), and the other with personally engaging and encouraging the child (in music therapy context), we can again see the difference in the theoretical approaches for these two contexts. Music therapy context is rooted in developmental psychology that is primarily exploring the relationship between the infant/child and mother/parent. We can see through AQR, or EBA instruments the traits of this kind of interaction. The therapist is taking the role of a figure that resembles a parent figure. The therapist is there to offer different ways of interaction, to find a way to calm the child down. The therapist is searching for the way to the child through emotional attunement (Schumacher et al., 2018).

4.2.5 Cognitive functioning

Cognitive functioning also differs in the ways it is assessed in these two contexts. In the medical context, thorough cognitive evaluation is a necessary element to determine if there is a presence of mental deficiency (Klin et al., 2013). Cognition is understood as real-life skills, meaning that only the knowledge that is applicable in practical life situations (like the ability to apply the abstract knowledge, like the image of the cat, to the practical purpose of recognising the cat on the street) is measured (William & Eaves, 2005). In practical terms, in diagnostic evaluation, the child's ability to solve problems that were pre-designed is measured. In music therapy assessment, the adjustments in the cognitive assessments approach can be made, depending on the interest of the child (Carpente, 2018). This means that the child can be assessed in the areas of different cognitive functioning that include rhythm patterns, melody structures, object manipulation and abstract play (Chase, 2004). The child's "best performance" can be measured only through one of the given cognitive

functions, or it can include an overall approach. Again, the difference between these contexts is in the flexibility of the assessment. The medical context has predetermined tasks that can measure cognition only within their domain, whereas music therapy assessment, being a semi-structured form, is flexible and adjustable to each child individually.

4.2.6 Sensory behavior

Sensory behavior is a very visible characteristic of ASD that is observable through involuntary body movements (Baranek et al., 2013). However, the audio sensitivity is reportedly one that is most common in this population (Baranek et al., 2013). In the medical context, sensory behavior is measured by the frequency and duration, and level of sensory impairment is evaluated accordingly. In a music therapy context, evaluation of sensory behavior is a more complex process that includes detection of pleasant and unpleasant audio stimuli (Wigram & Lindahl Jacobsen, 2018; Carpente, 2018). The difference is also in the interpretation of pathology of the sensory behavior. If for example a child is playing one piano key intensively and is refusing to engage in other activities, this type of behavior would certainly be categorized as pathological in the medical context. In music therapy, this engagement would be investigated further, by measuring in which way the child is engaging. For comparison, we can take the EBA assessment. Engagement in one music instrument would be investigated further, by measuring in which way the child is engaging: is he/she willing to play together with the therapist, or not (Wigram & Lindahl Jacobsen, 2018). If not, then the EBA assessment would measure a high level of autonomy trait that is an indicator for ASD. However, the EBA assessment can also analyse how the child is engaging not only with the therapist but with the musical instrument as well (Wigram & Lindahl Jacobsen, 2018). If there are strong and clear rhythmical patterns or melodic structure, this behavior could also be understood as more then purely pathological sensory impairment, but also as potential, based on the musical creativity that is displayed during the play (Wigram & Lindahl Jacobsen, 2018).

4.2.7 Communication

Communication deficits are a common feature of ASD (Paul, 2013). In the medical context, they are assessed with numerical or yes/no rating scales like the M-Chat instrument. Children with ASD are often non-verbal, with almost 40% of them using none, or a single word in communication (Paul, 2013). Medical context perceives communication as verbal and non-verbal, such as pointing gestures or eye contact which are also a deficit in ASD (Paul, 2013). Apart from these forms of communication, I did not find anything else in the medical context

that is referred to or understood as communication. Music therapy context does not assess language skills, nor does it refer to communication in the term of words (Bergmann, 2018). Music therapy context is measuring communication in music, and has a twofold purpose:

1)   the therapist and child can communicate with each other through music

2)   the child can communicate to the music without the attempt to communicate to the therapist (Schumacher et al., 2018).

Communication to the therapist occurs when the child is on a higher level of awareness and understands the presence of the therapist and wishes to engage in the joint activity (Schumacher et al., 2018). However, even without this awareness, the child can still communicate to the music itself, and still show some level of communication potential, by reacting for example vocally to a certain stimulus (Schumacher et al., 2018). In the MUSAD assessment, communication is measured more structurally by using congas to assess non-verbal, musical dialogue, and song singing for general speech evaluation that can include language skills assessment (Bergmann, 2018).

I think that the music therapy context offers a more thorough communication assessment because music and speech have the same properties of pitch, rhythm, dynamics. In the medical context, language is the focus of the assessment, because it relates to the practical life skills that are primarily assessed. Both speech and music can have a free and creative form. In music therapy context IMT is used to give the child the possibility of creative communicational expression, whereas the more structural form can always be achieved in songs that have words, chorus or other repeating patterns.

I will summarize the discussion chapter with some final thoughts about these two contexts. The summarization is based on my personal visual and textual understanding of the main differences between these two contexts. I will discuss the findings from the study interpreting how I think they relate to each other and in which ways I think they differ from each other. This is the next step in my study that can provide understanding upon which I will answer the research question in chapter 5.

4.3 Overview of both contexts

MEDICAL CONTEXT-SPIRAL OF COMPETANCE

HEALT-SOCIETY

Child

Parents

Pediatrician

Comprehensive evaluation

Product-static

MUSIC THERAPY CONTEXT-CIRCLES OF COMPETANCE

WELLBEING-INDIVIDUAL

Child

Child and therapist

Child and therapist in video analysis

Process-dynamic

4.3.1 Health and wellbeing

The difference between understanding of health as an absence of pathology in the medical context, or as wellbeing within any condition in music therapy context was already addressed in this chapter. I interpret these two contexts as similar in their attempt to bring something good to humanity. Based on the field of discipline they belong to (medicine and humanity), they are serving their purpose by evaluating ASD. I interpret that the medical model's contribution is in the precision and effectiveness to detect and diagnose ASD. The positive side of the short time period of evaluation in the medical model is that it is a cheap and efficient way to detect a person that needs treatment and care. Medical context is concerned with health and is, therefore, designed to evaluate the pathology of ASD as something that is unhealthy.

I interpret the music therapy context as the idea of assessing ASD through the wellbeing model that is rooted in music therapy discipline. In music therapy context the idea of health is a state of wellbeing. The child is therefore assessed on two levels:

1) for ASD traits

2) for a state of wellbeing within ASD traits (how these traits disturb the child and how they can be regulated)

I interpret music therapy's contribution in the ability to detect potentials already in the pre-diagnostic period as an important contribution to the overall portrait of a child. I also consider music therapy context as an autism-friendly way of assessing, because its design, structure and time period I see as a structure made by taking in consideration the usual challenges of ASD.

4.3.2 Spiral of competence and circles of competence

The two graphic pictures present my interpretation of the competence in these two contexts, in other words: who is considered competent, or the "expert", regarding comprehensive diagnostic evaluation and music therapy assessment. My understanding of the medical context is that it is a spiral in which the child is considered the least competent participant in collecting information for diagnostic purposes. We see that already in the phase where parents notice a problem in the behavior, in the case of the majority of all instruments presented in the table 1 in chapter 3, the child is not even involved in the diagnostic process. Further down the spiral, the parents are also getting excluded as soon as they present their concerns and

opinions about the child through rating scale. The next step of the comprehensive diagnostic evaluations is the highest level of experts for ASD. In this phase, we saw that out of six instruments that diagnose ASD the child is not included in three of them. In those instruments that do include the child, the pathology of the behavior is what is measured. Therefore, I consider this phase also as excluding towards the child, because if the child would, hypothetically speaking, show a high level of particular interest, or unusual abilities that also occur in ASD, this could not be measured, because instruments measure only the pathology.

In a music therapy context, the child is the expert on his/her abilities. Wigram & Lindahl Jacobsen (2018) named this the child-led approach. The child has the autonomy to choose if he/she will be the leader or the follower (Wigram & Lindahl Jacobsen, 2018), or whether he/she will be a passive or active participant (Bermann, 2018). The child is always in the center, and the other layers of competence, that can include therapist or even other members of the team for comprehensive diagnostic, could be added as Bergmann (2018) suggested in the video analysis. The child is always present as an active contributor to the final picture of who he/she is.

4.3.3 Static product and dynamic process

I would finally describe these two contexts as product-oriented and process-oriented. I interpret the medical context as product-oriented since the purpose of instruments from the medical context is to create a product, in other words, to create the document with the yes/no answer regarding the presence of ASD. In the medical context, the level of functioning is more of a snapshot based on the other people's interpretation of the child's behavior that is understood as the static level of pathology on the autism spectrum continuum.

Music therapy context I understand as process-oriented, meaning that its tools are more designed to measure a process rather than the exact presence of ASD. The process is creating a picture of the child from the way child interacts throughout a few sessions. The therapist is trying to meet the child, to understand who he/she is based on child's own expression, before reaching the final conclusion. This final picture is a presentation of the process that describes changes in the levels of engaging and functioning (Schumacher et al., 2018), and I understand it as the measurement of different possibilities.

I also want to add that the medical context offers a cross-sectional snapshot of the child at one given time point during the diagnostic testing session, whereas music therapy offers an ever-expanding view of the child with the child as the center of inquiry.

This chapter has provided the discussion on the findings from this study. The two different contexts of assessment for ASD were integrated in order to gain a new knowledge necessary for attempting to answer the research question of this study that will be addressed in the next chapter.

5 CONCLUSION

The purpose of this study was to answer the research question:

How might music therapy approaches/methods complement existing standardized diagnostic tools in the medical context of evaluating children with ASD?

The idea to do a study on this particular subject stems from both personal experience and the studies of parents' experiences with the negative aspects of the current diagnostic context of ASD. For answering the research question, I have chosen the design of integrative literature review, for selecting the information about how ASD is currently diagnosed in medical context and how it is assessed in music therapy context. Following the research design method, I have selected the literature on this subject. The method I have chosen for the interpretation of data is content analysis. Following this method, the data was grouped in two models, each representing different model for ASD evaluation/assessment. The data was coded and analysed. The interpretation of the data was presented in the form of discussion and comparison of two presented models, following the research design protocol.

The findings from this study indicate that these are two different models in terms of theoretical orientations, time they take for investigation, environment in which evaluation/ assessment occurs and the final interpretation of child's level of functioning. Based on the parents' reports, the accurate interpretation of child's overall behavior is missing from the current diagnostic context. The findings from the study indicate that the instruments that are currently used in medical context do not have the ability to measure any other aspects of behavior, except pathology. Findings from this study also indicate that music therapy model of assessing for ASD includes child's overall behavior by measuring both pathological traits of ASD, as well as individual potential of the child.

How might music therapy approaches/methods complement existing standardized diagnostic tools in the medical context of evaluating children with ASD?

The music therapy approaches to assessing of ASD could complement the existing standardized diagnostic context of evaluating children with ASD by:

1) Providing the process of diagnosing with additional music therapy assessment that could potentially be more pleasant for the child.

Parental reports indicate that the diagnostic process is stressful for the child. Since music therapy assessment for ASD is designed with the intention to provide the positive, child-friendly environment (Carpente, 2018), the inclusion of music therapy assessment into the

existing diagnostic context could potentially decrease the stress in children during the diagnostic process.

2) Providing the accurate picture of child's overall wellbeing that can be measured by music therapy assessment even with presence of pathology of ASD

Based on the parental reports, the current diagnostic context fails to recognise the individual potential in the child. The essential aim of music therapy assessment is to search for potentials in individual child during the assessment process (Schumacher et al., 2018; Wigram & Lindahl Jacobsen, 2018). By including music therapy assessment into the already existing diagnostic context, the parents could get a diagnosis that would provide the essential information about medical evaluation of their child, with additional opinion from the music therapist. Even though the music therapy assessment, if used isolated from medical context, cannot currently have the diagnostic credibility (Bergmann, 2018), it can still provide important information that parents find to be lacking in the medical context. Together, integrated into one overall assessment, these two contexts can provide a thorough diagnostic picture that reflects both medical and humanistic values of their synergy.

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