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# EFFECTS OF DEFUSION AND DEICTIC FRAMES INTERACTIONS ON THE DEVELOPMENT OF SELF-AS-CONTEXT IN INDIVIDUALS WITH DISABILITIES

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EFFECTS OF DEFUSION AND DEICTIC FRAMES INTERACTIONS ON THE  
DEVELOPMENT OF SELF-AS-CONTEXT IN INDIVIDUALS WITH DISABILITIES

by

Sebastián García- Zambrano

B.S., Konrad Lorenz Fundación Universitaria, 2011

A Thesis

Submitted in Partial Fulfillment of the Requirements for the  
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THESIS APPROVAL

EFFECTS OF DEFUSION AND DEICTIC FRAMES INTERACTIONS ON THE  
DEVELOPMENT OF SELF-AS-CONTEXT IN INDIVIDUALS WITH AUTISM

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Master of Science

in the field of Behavior Analysis and Therapy.

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## AN ABSTRACT OF THE THESIS OF

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TITLE: EFFECTS OF DEFUSION AND DEICTIC FRAMES INTERACTIONS ON THE DEVELOPMENT OF SELF-AS-CONTEXT IN INDIVIDUALS WITH DISABILITIES

MAJOR PROFESSOR: Dr. Ruth Anne Rehfeldt

The aim of this study was to evaluate the effects of a defusion exercise in combination with perspective-taking interactions as a brief protocol based on the Relational Frame Theory (RFT). The protocol was designed to alter verbal statements about the self through the implementation of training on deictic frames (I-YOU, HERE-THERE, AND NOW-THEN) in conjunction with an exercise of defusion. A pre-post design with a control group was implemented to evaluate the effects of the protocol on the frequency rate of self-as-context and self-as-content statements. Adolescents with disabilities were selected and assigned to each group based on the frequency rate of self-as-content statements. After the assignment of the participants to each group, each participant was interviewed individually through a structured interview aimed at identifying deictic frames and negative statements. Then, participants in the treatment group received the protocol of defusion and deictic frames individually, and participants in the control group received a social skills session on an individual basis. Finally, participants were interviewed individually through an interview based on the identification of deictic relationships and negative statements about the self. Results showed a significant effect in reducing the number of self-as-content statements and increasing the number of self-as-context statements for participants in the treatment group; however, changes did not reach the statistical significance when comparing the post-tests scores between the treatment and control group. Limitations of this study are discussed, and future research is recommended.

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The first part of this acknowledgements will be in Spanish.

Antes que nada, quiero expresar mis infinitos agradecimientos a Laurent, quien noche tras noche me brindo su inconmensurable apoyo para sortear las dificultades que surgieron en este proceso.

Este escrito es fruto de un trabajo mancomunado entre los dos.

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Now, the second part!

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## CHAPTER 1

### INTRODUCTION

The development of the self is one of the most studied topics in Behavioral Science in the last decades. The origins of the study of the self from a behavioral perspective go back to 1974, where Skinner identified the difference between the behavior in context, the behavior of reporting that the person is behaving, and the behavior of identifying the causes of the behavior in progress. For example, the verbal community teaches the child the difference between making a tantrum to get a candy (behavior 1), identifying what is being thrown into a tantrum (behavior 2) and recognizing that a tantrum is being made to get the candy (behavior 3).

From a Radical Behaviorism perspective, it is assumed that "self-awareness" arises from the interaction with members of the verbal community, because the verbal community teaches the individual to discriminate their own behavior and it promotes the development of verbal behavior to describe their own behavior (Dymond & Barnes, 1997). In other words, this position assumes that self-knowledge is based on the discrimination of our own behavior.

Multiple studies with non-human animals have been implemented to demonstrate that individuals learn to respond based on their own behavior, showing evidence in favor of the definition of self-awareness provided by Skinner (Pérez-Acosta, Benjumea- Rodríguez, & Navarro- Guzman, 2001). Overall, the studies oriented to identify the ontogenetic contingencies involved in the development of self-awareness are centered on the use of reinforcement programs and conditional discrimination tasks (Dymond & Barnes, 1997). For instance, Lattal (1975) used two contingencies of reinforcement (Differential Reinforcement Of-Low-Rate Behaviors and Differential-Reinforcement of Other Behaviors) to teach pigeons to discriminate the relationship between their own behavior and its consequences. In another study, Killeen

(1978) demonstrated that pigeons are able to discriminate conditionally whether or not their behavior generates effects in the context. He found that pigeons learn to discriminate with high precision if their pecking on a key modified the environmental conditions (turn off a light).

Despite the findings supporting the self-awareness definition provided by Skinner, contemporary behaviorists identified the need to study the verbal behavior involved in the development of the self. Unfortunately, Skinner formulated the verbal operants based on the behavioral history of other organisms and it is not based on the functional relations between the language and the environmental conditions (Gross & Fox, 2009). In addition, later studies found that Derived Relational Responding is involved in the development of complex verbal behavior (Green, Stromer, & Mackay, 1993; Hayes et al., 2002; Lipkens, Hayes, & Hayes, 1993; O'Hora et al., 2008).

#### Contextual Behavioral Science's philosophical assumptions

Contemporary behavioral psychologists have developed an empirical model of human language and cognition that has been called Relational Frame Theory (RFT). RFT is a theory oriented to explain the generativeness, flexibility and symbolic properties of the human language (Hughes & Barnes-Holmes, 2015b), by analyzing data from forty years on rule-governed behavior, stimulus equivalence, Derived Relational Responding, and operant conditioning (De Houwer, 2013).

RFT is built upon functional contextualism, a pragmatic philosophical perspective that assumes the act-in-context as the ontological root metaphor and the successful working as the truth criteria (Hayes, Barnes-Holmes, & Wilson, 2012). The act-in-context is the ontological assumption that considers the behavior of the whole organism and its historical and situational context as the matter of study of the behavioral science (Hayes, Barnes-Holmes, & Roche,

2001); consequently, the unit of study in behavioral science is the three-term contingency, a functional and probabilistic relationship between the environmental antecedents, the behavior of the organism and its consequences (Domjan, 2014). The truth criterion, the successful working, assumes that an analysis is true when the experimenter is able to control the environmental variables that covary with the target behavior to show an accurate prediction of the target behavior and demonstrate how the manipulation of the independent variables influence the target behavior (Levin, Twohig, & Smith, 2015).

According to RFT, relational responding is the root of human language (Hayes et al., 2001; Hughes & Barnes-Holmes, 2015a; Torneke, 2010). RFT approaches verbal events as activities, not concepts, while focusing on the impact that learned behavior has on our future behaviors (Hayes et al., 2001). Humans learn to establish relations between stimuli not only based on non-arbitrary (formally similar) properties but through arbitrary (formally dissimilar) properties (Zettle, Hayes, Barnes-Holmes, & Biglan, 2016). As an example of non-arbitrary relation, a child responds in the same way to the letter “a” in one book as to the letter “a” in another book. In addition, children learn non-arbitrary relations such as that a table is larger than a chair, or a cup is smaller than a plate; however, when it comes to social conventions humans can use multiple contexts to refer to stimulus relations. For instance, a child who speaks Spanish learns that the word “snake” in English means “serpiente” in Spanish, then without any kind of training she will be able to respond and point to the word “snake” when she sees a sign or a real snake on TV (De Houwer, Dymond, & Roche, 2013).

According to RFT, relating is a type of behavior in which the individual responds to one event in terms of another (Hayes et al., 2002). The ability to derive relations is associated with the development of the symbolic properties of the language; therefore, it is considered as the core

of the development of language and cognition. There are two types of derived relational responding: Non-arbitrarily Applicable Relational Responding (NAARR) and Arbitrarily Applicable Relational Responding (AARR).

NAARR is a relational response rooted in the history of direct experience and defined by the physical features of the stimulus presented (Stewart, Barrett, McHugh, Barnes- Holmes, & O'Hora, 2013). Relational responding to stimuli based on properties such as color, size, shape, and quantity is considered as an instance of NAARR because the organism is responding to the stimuli based on the physical properties (Hughes & Barnes-Holmes, 2015a).

Conversely, AARR is a behavior based on the ability to derive relations between stimuli and events independently of the formal properties (Zettle et al., 2016). AARR is considered a generalized operant behavior that is developed through ontogenetic contingencies that includes bidirectional training with multiple exemplars (Hughes & Barnes-Holmes, 2015b).

There are different types of relational frames. The most common type is sameness (or coordination, e.g., "A = B"); for instance, children respond similarly to seeing a picture of their favorite car or playing with it. Other types of relational frames are comparison (e.g., "C is taller than D"), opposition ("fast is the opposite of slow"), distinction ("this is not the same as that"); hierarchy ("a cat is a type of feline"), analogy ("A is to B as C is to D"), deixis ("I am here and you are there"), and temporality ("school comes before college"), amongst others (De Houwer, 2013).

RFT proposes three properties for considering the existence of a relational frame: a) mutual entailment, b) combinatorial entailment, and c) transformation of functions. Mutual entailment involves the bidirectionality of stimuli relations in a way that if a person learns that stimulus A is related in some way to stimulus B, then they will derive that B is related in some

way to A. For example, considering a relational frame of distinction, if a child is told that Carlos is faster than Pedro, they will derive that Pedro is slower than Carlos. Combinatorial entailment involves that two or more stimuli that have acquired the property of mutual entailment can be combined. For example, if a child learned that A and B were related in some way and that B and C were related in some way, this child will be able to derive a relation between A and C without direct training. In this example, if the child is told now that Carlos is faster than Sara, it will be derived that Sara is slower than Carlos, and, therefore, Carlos is faster than Sara. The implication of mutual and combinatorial entailment is that a myriad of stimuli relations can be learned without direct training (De Houwer et al., 2013).

The third defining feature of RFT is the transformation of functions. This term involves that the functions of one of the members of a relational frame can change the functions of the other members of the frame. If, for example, an individual is told that B is the opposite of A, and a conditioned reinforcing function is attached to A, the functions of B may be transformed such that it becomes a conditioned punisher because of its participation in a relation of opposition with A. Continuing with the same example, if the child is told that in order to participate in a school race, being faster is better, and we ask them to choose between Carlos, Pedro, and Sara, then the child would choose Carlos. This means that Carlos acquires reinforcing properties, while Sara will acquire punishing properties. The opposite would be true as well (Hayes et al., 2001).

### The Self from RFT

The derived relational responses associated with the concept of the self are a fundamental part of psychological flexibility. According to RFT, human self-awareness is based upon responding to one's own behavior and behaving verbally in relation to one's own actions (Hayes

& Wilson, 1993). This account is focused on the ontogenetic contingencies that involve a history of multiple exemplars of Arbitrary Applicable Relational Responding (AARR), facilitating the identification of the variables involved in the discrimination between their own behavior and the behavior of others (Barnes-Holmes, Barnes-Holmes, Roche, & Smeets, 2001).

The development of the self is built upon multiple exemplars of deictic frames that describe the relationship between the stimulus and the perspective of the speaker (Barnes-Holmes, McHugh, & Barnes-Holmes, 2004). The frames involved in the development of perspective-taking skills are I-YOU, HERE-THERE, and NOW-THEN (Hayes et al., 2001). In relation to the processes that underlie the acquisition of relational frames, deictic frameworks are not different from the frameworks of coordination, opposition, and hierarchy, among others; however, the acquisition of deictic frameworks requires that the individual has previously developed the frameworks of coordination, opposition, distinction, and hierarchy (Barnes-Holmes, Foody, Barnes-Holmes, & McHugh, 2013). The acquisition of temporal and spatial relational frames as precursors to the development of deictic frames can be understood through a familiar example. If a teacher identifies that one of their students is distracted in class, they can approach and ask, "what are you doing?" Depending on the student's response, the teacher may say "see you in my office after class." In this simple example, the student is exposed to questions that involve the I-YOU, HERE-THERE, and NOW-THEN discrimination.

Verbal self-knowledge is defined as verbal descriptions of one's own behaviors and the contingencies that control their own behaviors, altering relevant behavioral functions (Stewart, Villatte, & McHugh, 2012). For example, in the typical task of self-control in children where they are exposed to a situation where they choose between having immediate access to a small candy or accessing a larger amount of candy after a while. In the typical situation, the child is

asked what choice they made and why; the response generally shows that children with advanced verbal development developed a coordination relational frame between the delay and "more candy" while "immediate" is related to "less candy."

Several studies were implemented to evaluate the development of deictic frames from a behavioral perspective. McHugh, Barnes-Holmes, and Barnes-Holmes (2004) designed and used a brief protocol to develop deictic frames in order to evaluate the correlation between the results of the protocol and the age of the participants. They found that the early childhood group make more mistakes than older groups and reverse relations were associated with more errors because those relations require more complex derivations between relations. Subsequently, Heagle and Rehfeldt (2006) used a deictic frame protocol to evaluate the development of perspective taking and generalization in natural contexts; their study showed that the I-YOU, HERE-THERE, and NOW-THEN relational frames can be established through a history of reinforced relational responding. In addition, the response generalization in social situations evidenced in the study is consistent with RFT, in the sense that perspective-taking is a generalized, overarching response class. In another study, Weil, Hayes, and Capurro (2011) implemented a protocol to develop the I-YOU, HERE-THERE, and NOW-THEN relational frames as operant behaviors through three levels of complexity in children with neurotypical development. The protocol used for them provided a curriculum framework recommended for individuals with weak or non-existent perspective taking skills. In the same year, Davlin, Anne Rehfeldt, and Lovett (2011) used a more naturalistic protocol for the development of perspective taking in individuals without disabilities. Their results showed that a history of Multiple Exemplar Training is sufficient to remedy deficits in perspective-taking skills.

## Self and Acceptance and Commitment Therapy (ACT)

The Acceptance and Commitment Therapy (ACT) is based on the principles of behavioral science, with an overarching goal of increasing psychological flexibility. ACT evolved from a functional contextualist perspective incorporating the philosophical foundations of RFT (Zettle et al., 2016). ACT is the only clinical behavioral approach to psychotherapy that is consciously derived from RFT (Hayes, Barnes-Holmes, & Roche 2001). Overall, ACT promotes positive thinking and behaviors through a focus on contacting the present moment and experiencing all that it has to offer (Hayes, Strosahl, & Wilson, 1993).

The use of Acceptance and Commitment Therapy (ACT) has risen in popularity over the past 20 years. ACT has a growing empirical base demonstrating its positive effects on an array of problems, including the treatment of anxiety and depression (Hayes, Luoma, Bond, Masuda, & Lillis, 2006), rehospitalization in individuals with psychosis (Bach & Hayes, 2002), and chronic pain (Dahl, Wilson, & Nilsson, 2004; Vowles et al., 2007).

ACT was built with a set of coherent processes that are applied with precision, scope, and depth to a variety of clinically relevant problems (Steven C Hayes et al., 1993). There are six processes that are the basis of psychological inflexibility: experiential avoidance, cognitive fusion, attachment to the conceptualized self, inaction or avoidance persistence, disruption of values, and inflexible attention (See Figure 1).

According to Hayes et al. (2006), ACT incorporates sessions oriented towards the six components of psychological flexibility: acceptance, cognitive defusion, being present, self as context, values, and committed action (See Figure 2).



Acceptance refers to the recognition of thoughts, sensations, and emotions without emitting responses to modify them (Szabo & Dixon, 2015). Acceptance of private events involves the awareness of private events, recognizing and identifying thoughts, memories, and sensations that have previously been avoided or that the person has tried to modify through the implementation of experiential exercises that promotes flexible interactions with previously avoided private events (Luoma, Hayes, & Walser, 2007).

Present-moment awareness refers to the individual responding to events that occur at the present time, allowing the behavior to be modified and maintained by direct contingencies (Szabo & Dixon, 2015). In other words, this component helps the client to respond to undesired private events in a different way and facilitates the acquisition and maintenance of adaptive behaviors. Overall, ACT promotes the ongoing and non-judgmental contact with private events and environmental events as they occur (Luoma et al., 2007).

Values refers to the act of identifying patterns of action that are reinforcing and that lead to valuable consequences (Szabo & Dixon, 2015). In other words, values are considered as verbally constructed consequences of ongoing, dynamic, evolving patterns of activity that are related with contingencies of reinforcement (Hayes, Strosahl, & Wilson, 1999). Value exercises help the clients to take distance from everyday problems and choose values-consistent life directions (Luoma et al., 2007).

Commitment refers to the establishment of goals and the emission of behaviors that guide the person towards the valued elements (Szabo & Dixon, 2015). According to Hayes et al. (1999), a committed action is a values-based behavior that is related with a pattern of action oriented to the individual's values. In other words, a committed action is emitted when the client engages in behaviors that are consistent with their values.

Defusion refers to the process of creating non-literal verbal contexts in which thoughts are active and ongoing events that are related with the history of learning of individuals (Hayes et al., 1999). Thus, defusion involves the deliteralization of psychological content (Szabo & Dixon, 2015), through the use of exercises that expand relational frames and modify the function of private events, altering the impact of private events without a modification of their topographies (Hayes et al., 1999).

In relation to the development of perspective taking, Hayes (1995) stated that individuals can develop three functionally different types of self: self-as-content, knowing-self, and self-as-context. Below are the definitions and descriptions of each of the types of self from the RFT.

Self-as-content is defined as the descriptive and evaluative relational framework built upon the history of the individual and their repertoire (Stewart et al., 2012). The history of the individual with their environment is organized by the individual through a coherent relational frame made HERE and NOW about their behavior that occurs THERE and THEN. In other words, the descriptions and evaluations are in a frame of coordination with the self.

Some difficulties may arise when individuals respond to self-as-content statements as objectively true statements. When the psychological contents of the self-as-content are static and not experiential, they are functionally rigid and evaluative, and since they are in a framework of coordination with the self, the self becomes rigid and conceptualized (Foody, Barnes-Holmes, & Barnes-Holmes, 2012). When the behavior is controlled by the self-as-content, the repertoire become rigid and static because the behavior is in accordance with literal thoughts and self-rules (Foody, Barnes-Holmes, Barnes-Holmes, Rai, & Luciano, 2015). Overall, the cognitive fusion produced by the frame of coordination increases the likelihood that covert behavior controls overt behavior.

The knowing-self, or the self-as-process, is a continuous verbal discrimination of psychological events (Stewart et al., 2012). The self-as-process involves verbal discriminations of covert and overt behaviors that facilitate the awareness of private events when they occur (Luciano, Valdivia-Salas, & Hernandez, 2009). The psychological contents of the self-as-process are continuously and functionally not fused with the self, which produces greater psychological flexibility in individuals (Foody et al., 2012). Although the psychological contents are in a framework of HERE-NOW, the process is fluid and does not remain static, so the content is not fused functionally with the self. In other words, the individual learns the difference between themselves and their psychological content; therefore, the distance between the person and their private events decreases the psychological inflexibility (Foody et al., 2015)

On the other hand, the self-as-context is a product of the verbal responses that are part of the behavioral repertoire, including both verbal and non-verbal self-statements. According to Luciano et al. (2009), self-as-context modifies the self-as-content and self-as-process statements due to the constant "I" as separate from the person's experiences, promoting coherence with other private and public events. Behaving under the self-as-context involves a deliteralization of the psychological contents while the content goes from a relational framework of HERE-NOW to one of THERE-THEN (Foody et al., 2012). Overall, the individual learns the discrimination between "I" (located HERE and NOW) and the private events (located THERE and THEN).

#### Measurement of self

Contextual Behavioral Scientists have developed multiple indirect methods of evaluation with the objective of evaluating the experiential avoidance behaviors associated with psychological discomfort. Multiple scales have been developed from ACT to assess

psychological distress, acceptance, perspective taking, the present moment, defusion and the emission of committed actions (Batink, Jansen, & Peeters, 2015).

Lately, psychologists have focused on the direct measurement of verbal behavior emitted by patients during psychological consultation. For instance, Sancho (2011) implemented the “Taxonomical subsystem of classification of client’s verbal behavior” to measure the verbal behavior of clients during the sessions. She used the following categories:

- 1- Information: Any verbalization in which the client provides descriptive information for assessment and treatment.
- 2- Ask for information: Any verbalization in which the client asks for information to the therapist
- 3- Agreement: Any verbalization in which the client shows agreement to the therapist’s verbal behavior.
- 4- Disagreement: Any verbalization in which the client shows disagreement to the therapist’s verbal behavior.
- 5- Wellness: Any verbalization in which the client describes satisfaction, happiness or wellness.
- 6- Discomfort: Any verbalization in which the client talks about suffering due to the problem behaviors.
- 7- Achievement: Any verbalization in which the client describes the achievement of personal goals.
- 8- Failure: Any verbalization in which the client describes the lack of achievement of personal goals.

9- Following instructions: Any verbalization in which the client describes that he/she follows instructions.

10- Emotional reaction: Any sentence that describes an emotional reaction to a specific event.

Sancho (2011) hypothesized that the distribution of the verbal behavior categories could be modified as a function of the clinical activities. The results showed that Wellness, Achievement, and Following instructions had a low average in the assessment sessions and a high average during the treatment sessions. However, the Failure category follows an ascending trend with a low average during the assessment sessions and a high average on the treatment sessions. In general, the most common verbalizations were Information and Agreement. In addition, the Discomfort category maintains a stable trend across the sessions. However, during the treatment, the most common verbalizations were Following Instructions and Agreement. The author suggested to continuing the depuration of the verbal behavior's categories.

Later, Atkins and Styles (2016) used a contextual-behavioral account of self to explore whether long-term wellbeing is predicted by the way a person talks about themselves and what they care about. Participants were doctors, nurses, administrative managers and practicing lawyers. The authors conducted interviews in which the participants describe recent situations related to a) delight, b) anxiety or stressed c) anger, d) conflict about something, e) strong stand or conviction; and f) important things in life. The verbal behavior was coded at a sentence level, following these operational definitions:

1- Self-as-story: the sentence is referred to the speaker through the use of I- YOU, describing a conceptualized aspect of self and /or evaluations of those qualities, those qualities appear to be relatively insensitive to changes in the context, and they were held as literally true

as opposed to been seen as one possible conceptualization of the self. For example, “In social situations, I always get anxious”.

2- Self-as-context: the sentence is referred to the speaker using I- YOU, describing an experience of the self (I-HERE-NOW) in a relation of distinction from private experiences (THERE-THEN). For example: “I noticed I was both angry and sad at the same time”, “There’s an awareness that comes when I step back to see what’s going on”.

3- Self-rules: the sentence is referred to the speaker using I- YOU, describing a response that should be emitted under specific circumstances to achieve an outcome. This verbal behavior includes sentences in which one of the components (response – antecedent event-consequent event) is not explicit.

4- Control-Oriented rules: The sentence suggested how the individual should or should not behave in a given situation in order to avoid/ escape from aversive experiences. For instance, “You shouldn’t make a decision if it’s going to come back to bite you”.

5- Value-oriented self-rules: The sentence suggested how the individual should or should not behave in a given situation in order to contact desired experiences. For example, “I need to be using at least some of my skills to feel I’m making a valuable and specific non-generic contribution”.

In addition, the measurement system included: a) The PANAS, b) The DASS-21, c) The 18-item Psychological Well-Being scale and, d) The Five-item satisfaction with life scale. Results showed that it is possible to code verbal behavior using ACT contexts to measure wellbeing. Statistical analysis suggested that self-discrimination statements may causally affect well-being. Besides, a high frequency of self-as-story was associated with low well-being, especially if the conceptualizations were negative. When a person is unable to test the

functionality of self-rules, the outcome is a greater rigidity due to the lack of discomforting evidence (Atkins & Styles, 2016). The main limitation of their study was the size of the sample (n=29), and further research should be focused on exploring how the therapist's behavior affects the elicitation of client's verbal behavior, evaluate the relationship between this type of coding verbal behavior and traditional scales for measure psychological flexibility, and expand the coding to include the characterization of others.

#### Empirical Evidence using defusion and perspective-taking exercises

Multiple ACT-based exercises have been carried out to modify perspective-taking and self-statements. Generally, exercises include defusion and perspective taking activities. For example, Luciano et al. (2011) compared two defusion protocols with 15 adolescents with high scores of emotional symptoms, the inclusion criteria for this study included high scores on the Behavior Assessment System for Children. The authors implemented a quasi-experimental design with repeated measures. The independent variables were two types of defusion exercises: Type I involved interactions based on deictic frames and Type II involved hierarchical framing examples and examples for promoting the regulation of behaviors. The instruments used in the study were Behavior Assessment System for Children, Spanish Avoidance and Fusion Questionnaire (AFQ-S), Accepting without Judgment Scale of the Kentucky Inventory of Mindfulness Skills (KIMS), Impulsive Behavior Inventory (IBI) and Emotional Behavior Inventory (EBI). Results showed that Defusion II had a higher effect than Defusion I. In addition, a non-experiential values-oriented protocol was implemented before the interventions in order to promote a motivational context for the behavioral intervention.

In another study, Foody, Barnes-Holmes, Barnes-Holmes, and Luciano (2013) implemented a study oriented to evaluate the effects of deictic (distinction intervention) versus

hierarchical deictic relations (hierarchical intervention) in a self as context exercise with a non-clinical sample of undergraduate students. Thirty-six participants were allocated randomly across the two conditions. Although this study was considered as a replication of Luciano et al. (2011), the intervention was considered as a self-as-context (instead of defusion) because it appears to be more precise with RFT than the term defusion. This study supports the notion that in the self-as-content the psychological content is in a frame of coordination with the self in the HERE-NOW, in the self-as-process the psychological content is in a frame of coordination with the self in the HERE-NOW but the private events are ongoing, and in the self-as-context the self is located HERE-NOW and the psychological content is located THERE-THEN. Results showed that the self-criticism task was effective to increase discomfort, stress, and anxiety in all participants. In relation to the difference between groups, the distinction intervention did not reduce discomfort and increase stress in participants; the hierarchical intervention did not produce a significant decrease in discomfort, but it was effective to reduce stress in participants.

Later, Foody et al. (2015) evaluated the utility of distinction versus hierarchical interventions with a focus on the self. Forty-eight participants were allocated in one of the following conditions: self-distinction, self-hierarchy, object distinction, and object hierarchy. In the self-distinction group, experimenters used the Leaves on the stream metaphor and participants were asked to notice the distinction between having private events HERE and placing them THERE. In the self-hierarchy group, experimenters used the Leaves on the stream metaphor and participants were asked to notice that the person (HERE) is the context in which the private events occur, and they can be placed THERE. Authors found little or no significant differences between self-distinction and self-hierarchy interventions on anxiety and discomfort measures. However, self-hierarchy intervention produced higher effects on stress. Those



findings, concord with the outcome reported by Luciano et al. (2011). According to Foody et al. (2015), these results suggest that hierarchical interventions produce positive outcomes in the reduction of stress; however, the clinical benefits of this type of interventions should be assessed.

In addition, Duff, Larsson, and McHugh (2016) studied the relations between ACT-factors and evaluations of self-statements. On this study, 79 undergraduate students answered the Action and Acceptance Questionnaire-II (AAQ-II), the Cognitive Fusion Questionnaire- 13 (CFQ-13), the General Health Questionnaire 12 (GHQ-12), the Mindful Attention Awareness Scale (MAAS). They found positive associations among psychological distress and psychological inflexibility and stronger believability evaluations of self-statements were associated with greater levels of psychological distress, cognitive fusion, and experiential avoidance. The authors suggest that individuals with higher levels of psychological inflexibility and extremely distress could be unwilling to engage with thoughts beyond assessing their believability.

### Purpose

Research on the effects of the use of defusion and perspective-taking protocols have been shown to be effective in modifying the literalization of unwanted thoughts and altering the relational frames associated with person, place, and time. In most cases, the measurement of the effects of the ACT protocols is based on the use of psychometric tests and statistical analysis. However, it is necessary to implement a measurement system to identify the changes in verbal behaviors during sessions in order to identify the relations derived by the patient.

Therefore, the purpose of this investigation is oriented towards two ways; First, to extend the studies on the codification of verbal behavior associated with the development of the self, and second, to evaluate the effects of a brief protocol of defusion and perspective on the

statements associated with self-as content, self-as-process, and self-as-context to diminish the psychological suffering derived from the literalization of the psychological content related to the self. This is relevant on a clinical setting because the psychological discomfort can be derived when our own descriptions and evaluations about ourselves become part of the conceptualized self, producing a struggle with the derived relationships between the self and the contents of the self (Hayes et al., 1999).

Based on the stated objectives, the alternative hypothesis established for this study was that the implementation of a short protocol of defusion and deictic frames increases the rate of verbalizations of self-as-context in individuals with disabilities. Likewise, the null hypothesis established for the study was that the implementation of a short protocol of defusion and deictic frames maintains the rate of verbalizations of self-as-context in individuals with disabilities.

## CHAPTER 2

### METHOD

#### **Participants**

A non-probabilistic sample was used by convenience. The participants were twenty individuals with disabilities enrolled in rehabilitation services provided by the Southern Illinois University's Rehabilitation Institute in 2017. The inclusion criteria were: 1- people with disabilities receiving rehabilitation services in one of the rehabilitation centers of Southern Illinois University (SIU), and 2- the potential participant emitted at least one self-evaluation during the initial interview.

Four women, corresponding to 30% of the participants, and sixteen men, corresponding to 70% of the participants, were selected for this study. Selection of participants was based on the occurrence of self-evaluations and judgments about themselves during the rehabilitation sessions that the participants usually receive in the SIU centers. If the person did not issue any self-evaluation during a daily rehabilitation session, the person was not included in the study because it was necessary to ensure that the person's behavioral repertoire included self-awareness behaviors (See Table 1). None of the selected participants withdrew from the study.

For this study, the total sample was 20 individuals, with an age dispersion between 13 and 27 years. The average age was 19.6 years with a standard deviation of 2.9. The median was 19.5 years and the mode was 19 years. With these values, the distribution of age among the participants is symmetrical (See Table 2). All the participants were born in the United States and their natural language is English.

In relation to the disability of the participants, 9 participants have a diagnosis of autism (45% of the participants), 8 participants have a diagnosis of learning disability (corresponding to 40% of the sample), 2 participants report an intellectual disability (10 % of participants), and

only one participant has a diagnosis of Traumatic Brain Injury (corresponding to 5% of the participants). See Figure 3.

The use of self-evaluations by potential participants ensures that participants have developed the basic self-awareness skill: the discrimination of their own behavior and the description of it (Dymond & Barnes, 1997). In order to guarantee the equivalence of the groups regarding the number of self-evaluations and to control strange variables that could be affecting the participants' verbalizations, a randomized block design procedure was used. On this procedure, the experimenter divided the participants in blocks based on the self-evaluations statements during one regular session. The use of this procedure helps to increase the equivalence of the groups in relation to the dependent variable. Three participants emitted more than 10 self-evaluations (two participants were randomly assigned to the ACT group and one participant was randomly assigned to the control group), six participants emitted 6 to 10 self-evaluations (three participants were randomly assigned to the ACT group and three clients were randomly assigned to the control group), and eleven participants emitted 1 to 5 self-evaluations (five participants were randomly assigned to the ACT group and six participants were randomly assigned to the control group; See Table 3).

Ten participants were randomly selected to the control group (3 women and 7 men), representing 50% of the sample selected for this study. As mentioned above, the control group included 1 participant with highly frequent self-evaluations, 3 participants with moderately frequent self-evaluations, and 6 participants with infrequent self-evaluations (See Table 3).

Ten participants were randomly selected to the ACT group (3 women and 7 men), representing 50% of the sample selected for this study. As mentioned above, the control group

included 2 participants with highly frequent self-evaluations, 3 participants with moderately frequent self-evaluations, and 5 participants with infrequent self-evaluations.

On the other hand, the ethical guidelines followed by the experimenter during this research included assessment of possible risks derived from research for participants, implementation of informed consent, explanation of the consent to the participants, and procedures to keep privacy and confidentiality (Graham, Powell, Taylor, Anderson, & Fitzgerald, 2013). No compensations were provided to participants. All experimental procedures were approved by the Southern Illinois University Human Subjects Research Committee.

### **Setting and Materials**

This study was implemented during the first semester of 2018. Evaluation and intervention sessions were implemented over two months, with periods between sessions no longer than 3 days. For each participant, pre-test, intervention, and post-test sessions were implemented in the same week. Based on the schedule of the participants and their suggestions, the time of application was between 9:00 AM and 8:00 PM. In all conditions, one small room (7mts x 7mts) in one of the SIUs rehabilitation centers was used for the implementation of the procedure. Each room was equipped with at least three chairs for adults, one table, and an iPhone® 5S to record the sessions. The average temperature of the room was 20°C.

The average of the total duration of the interview used for the pretest and the posttest was 9 minutes (range between eight to eleven minutes). The intervention sessions (for both the intervention group and the control group) lasted approximately 25 minutes. On average, the implementation of the procedure (pretest, intervention, and post-test) lasted a total of forty-five minutes.

In addition, the ACT intervention sessions included a chessboard used to illustrate the chessboard metaphor and to facilitate the defusion strategy. No materials were used for the control group.

### **Variables, response measurement, and reliability**

The dependent variables were recorded during the pre-test and post-test interviews. Then, two independent transcribers and researcher transcribed all audios in a Word® document; 50% of audios (20 audios over 40 recordings) were transcribed by two independent transcribers. Subsequently, each of the Word® documents were analyzed and coded based on the definitions of the behaviors analyzed in this study. In order to reduce the bias in the people who made the transcripts, transcribers were not informed about whether the transcriptions were part of the pre-test or post-test, nor audios corresponded to the control and treatment groups.

All verbal behaviors analyzed in this study were measured by the response rate. The response rate is a measurement based on repeatability since it establishes the number of responses for a given unit of time (Cooper, Heron, & Heward, 2007). This type of measurement is appropriate when the measurement time is not constant and varies between individuals. As mentioned above, the interviews implemented had a different duration since the length depended on the questions asked and the time was not a variable to establish the interview period. All interviews were transcript, coded and measured based on the following categories:

Self-as-content: One sentence in which the client described himself through the use of I – YOU, using an evaluation of himself or a permanent attribute of himself in the frame HERE-NOW (Atkins & Styles, 2016). For example, "In social situations, I always get anxious", "I failed on the test because I am stupid" and, "I am a depressive person". This definition includes descriptions of past, present, and future events.

Self-as-context: One sentence in which the client described himself through the use of I – YOU, describing an experience of the self (I-HERE-NOW) in a relation of distinction from private experiences THERE-THEN (Atkins & Styles, 2016). For example: “I noticed I was both angry and sad at the same time”, and “There’s an awareness that comes when I step back to see what’s going on”.

Self-rules: the sentence is referred to the speaker using I- YOU, describing a response that should be emitted under specific circumstances to achieve an outcome (Atkins & Styles, 2016). This code includes sentences in which one of the components (response – antecedent event- consequent event) is not explicit. For example: “I must do something meaningful with my life”.

Control-Oriented rules: The sentence suggested how the individual should or should not behave in a given situation in order to avoid/ escape from aversive experiences. For instance, “You shouldn't make a decision if it’s going to come back to bite you”.

A graduate student and the experimenter coded the verbal behaviors established for this study. A one-hour training session was implemented to ensure that the coding was reliable. The graduate student read the definitions of the behaviors and the researcher gave multiple examples of each behavior. The graduate student requested more examples, and the experimenter provided the necessary examples for the student to make a reliable measurement. In order to control the biases, the graduate student did not know the group to which the participant belonged or the stage in which the audio was recorded.

To guarantee the reliability of the data obtained, the Interobserver Agreement (IOA) was calculated. IOA is the degree to which the two independent coders report the same values when coding the same sessions. The guidelines followed to guarantee a valid IOA were: 1- the

observers used the same measurement system, 2 - observers coded the same transcripts, and 3 - the coders measured the behaviors independently (Cooper et al., 2007).

Percentage of agreements was used to calculate the degree of agreement between the coders. An agreement was defined as both observers recording the same behaviors during interviews. This measurement is expressed as the agreement percentage between the total number of agreements between the coders and was calculated through the following formula:

$$\text{TOTAL COUNT IOA} = \frac{\text{Number of agreements}}{\text{Number of agreements} + \text{Number of disagreements}} \times 100$$

The IOA was calculated for 30% of the pre-test and post-test interviews (corresponding to 12 tests of the 40 coded interviews). The selection of the coded interviews to measure IOA was carried out randomly. Mean agreement was 96% (range, 86% to 100%). However, during the experiment, it was necessary to run an additional training to increase the reliability.

### **Design**

A nomothetic quasi-experimental design was implemented. A pretest- posttest control group design with matched groups was used to evaluate the effects of defusion and deictic frames on the development of the self-as-context.

Initially, the sample was selected for convenience, where the experimenter selected twenty individuals with disabilities who said self-evaluations during the typical sessions of intervention in the SIU rehabilitation centers. Then, a randomized block design procedure was used to guarantee the equivalence of the groups regarding the number of self-evaluations and to control strange variables that could be affecting the participants' verbalizations. The number of self-evaluations in the selection of participants ranged from one to fifteen self-evaluations;



therefore, three ranges of self-assessments were established to perform the matching procedure. The first range is between eleven and fifteen self-evaluations, the second range is between six and ten self-evaluations and the third range is between one and five self-evaluations (See Table 3).

Ten participants were randomly selected to the ACT group (3 women and 7 men), representing 50% of the sample selected for this study. As mentioned above, the control group included 2 participants with highly frequent self-evaluations, 3 participants with moderately frequent self-evaluations, and 5 participants with infrequent self-evaluations.

Ten participants were randomly selected to the control group (3 women and 7 men), representing 50% of the sample selected for this study. As mentioned above, the control group included 1 participant with highly frequent self-evaluations, 3 participants with moderately frequent self-evaluations, and 6 participants with infrequent self-evaluations (See Table 3).

On the other hand, the independent variable corresponded to the administration of the brief ACT protocol. For the treatment group, the administration of a brief protocol that combined defusion and deictic frames to modify self-as-context statements; for the control group, the independent variable corresponded to a social conversation about daily situations.

The integrity of the procedures was evaluated through the use of a checklist that allowed to evaluate if the procedure was implemented properly (See Appendix 1). The check list has 5 items to evaluate the integrity of the established procedures. Procedural integrity was calculated 10 times, corresponding to 25% of the sessions implemented. After calculating the integrity of the procedure, it is determined that the experimenter followed the steps defined in a proportion of 94% (range, 80% to 100%).

According to the type of data collected in this study, the distribution of the data is not normal because the size of the sample is nil. For this reason, the null hypothesis assumes that the median of the pre-test of the treatment group is equal to the median of the treatment group. Additionally, the alternative hypotheses is that the median of the pre-test for treatment group is different than the median of the post-test for the treatment group. In addition, the second null hypothesis is that there will be no difference between the brief ACT protocol and a social interview for individuals with disabilities with regard to the distribution of the self-as-context, self-as-content, self-rules, and control-oriented rules statements in the post-test. The secondary alternative hypothesis is that the distribution of the self-as-context, self-as-content, self-rules, and control-oriented rules statements for the individuals who received the brief ACT protocol will be lower than of the participants in the control group.

Because the distribution of the data for this study is not assumed as normal due to the size of the sample and the population distributions for the dependent variables shared a similar unspecified shape but with a possible difference in measures of central tendency, Wilcoxon test was carried out to evaluate the effects of the protocol in the treatment group (comparing the medians of the pre-test and post-test). In addition, a Mann Whitney U test allowed us to evaluate the difference between medians of the treatment and control groups, since the data are independent.

## **Procedure**

### *Pre-test and posttest.*

The pre-test and post-test measurements were carried out through an individual semi-structured interview. Each participant was interviewed in a one-on-one environment by the experimenter. At the beginning of the session, the participant was reminded that the interview

was going to be recorded with the iPhone and the recording was started. Then, the semi-structured interview began. The interviews addressed the following topics: the reasons for attending mental health services in the rehabilitation institutions of SIU, the unpleasant feelings triggered by difficult situations described by the participants, the thoughts that were elicited by those situations, the description that the participants they made themselves and the strategies they used to accept and/or avoid unpleasant private events (See Appendix B).

### *Treatment group*

Each intervention session was carried out in a one-to-one environment. The participant and the experimenter sat in front of a table on which there was a chess game. To facilitate the client's attention to the metaphor used, the pieces of the chess were only put on the table after the defusion exercise.

The session was divided in two parts: the first part involved the chessboard metaphor (Stoddard & Afari, 2014), and the second part involved a defusion exercise oriented to develop the self-as-context.

In the first part, the experimenter described the following metaphor: “Think of your thoughts and feelings as chess pieces on a chessboard. Think of the white pieces as the thoughts and feelings you want (e.g., "confidence", “happiness”, “self-esteem”), and the black pieces as the thoughts and feelings you don't want (e.g., “anxiety”, “fear”, “self-doubt”, “hopelessness”).

One thing humans do is try to defeat the black pieces. We want to get rid of our negative thoughts and feelings. So, we go to war. At difficult times in our lives, it looks like we’re losing—the black pieces knock most of the red pieces off the board. At other times it may look like we are winning. We knock many of the black pieces off the board.

But look closely at your experience. What happens when you knock those black pieces off the board? Do they stay off forever, or do they come back sooner or later? Or do you find sometimes that new black pieces take the place of some of the old ones? It's like a war that rages forever, with no end in sight.

The problem is, when we wage this war, we wage it against ourselves. When we battle the black pieces, we battle a part of our experience, a part of ourselves. We literally set up a situation where, in order to get on with life, large parts of our actual experience must disappear forever. This war carries a heavy cost. We can become absorbed with our internal struggles and disconnected from the outside world and the things in life that matter most to us. We can become so absorbed with the internal struggles that we don't "see" the outside world".

Then, participants placed the emotions and feelings as if they were part of the chess game, using the phrase "I have the thought that ..."

In the second part, the experimenter described the metaphor relating the self-as-content with the furniture and the self-as-context with the house. This is the description of the metaphor used: "Your thoughts and emotions are like the furniture you put in your house. Suppose you win the lottery and buy a mansion in the most elegant neighborhood of the city where you want to live. However, the seller of the house does not notify you that the house is fully furnished with old, damaged and dirty furniture. Can those pieces of furniture reduce the value of the house? If you bought a cardboard house full of mold, would it increase the value if you buy the finest furniture you can imagine? Do you think that fine furniture could modify the value of the house in some way? What would happen if you were the house and your thoughts and emotions were the pieces of furniture? You will like some furniture in the house and others not so much, but the furniture is not the house. likewise, you are not your thoughts and emotions, the house is simply

the place where the furniture is placed, and the furniture does not increase or decrease the value of the house”.

*Control group*

Participants in the control group had a conversation about the experience of receiving rehabilitation services. These sessions were implemented individually in a one-to-one setting. During these sessions, the experimenter facilitated a discussion related to the difficulties experienced in the last years and promotes the descriptions.

## CHAPTER 3

### RESULTS

Because the distribution of the data for this study is not assumed as normal due to the size of the sample and the population distributions for the dependent variables shared a similar unspecified shape but with a possible difference in measures of central tendency, Wilcoxon test was carried out to evaluate the effects of the protocol in the treatment group (comparing the medians of the pre-test and post-test). In addition, a Mann Whitney U test allowed us to evaluate the difference between medians of the treatment and control groups, since the data are independent.

In relation to the pre-test for the treatment group, it is evident that the self-as-content variable has an average of 2.7 statements per ten minutes under a standard deviation of 2.54 (range, 0 to 8 statements per ten minutes). The variable self-as-context has an average of 1.8 statements per ten minutes under a standard deviation of 1.68 (range, 0 to 4 statements per ten minutes). The variable self-rules has an average of 0.5 statements per ten minutes under a standard deviation of 0.84. Likewise, the variable oriented rules always had a frequency of 0 in the pre-test measures (See Table 2).

In relation to the pre-test for the control group, the self-as-content variable has an average of 1.3 statements per ten minutes under a standard deviation of 0.82 (range, 0 to 3 statements per ten minutes). The variable self-as-context has an average of 2.5 statements per ten minutes under a standard deviation of 1.7 (range, 1 to 6 statements per ten minutes). The variable self-rules has an average of 0.8 statements per ten minutes under a standard deviation of 1.31. Likewise, the variable oriented rules always had a frequency of 0 in the pre-test measures.

Prior to the intervention, a Mann-Whitney test indicated that the self-as-context was equal for treatment group ( $Mdn = 2$ ) and control group ( $Mdn = 2$ ),  $U = .39$ ,  $p = .43$  in the pre-test scores. In addition, a Mann-Whitney test indicated that the self-as-content was equal for treatment group ( $Mdn = 2$ ) and control group ( $Mdn = 1$ ),  $U = 37.5$ ,  $p = .35$  in the pre-test scores. Therefore, no significant differences were found between groups on the pre-tests scores. These results show that the groups were equivalent at the beginning of the study, despite the topographical differences when participants talk about themselves.

In relation to the post-test for the treatment group, it is evident that the self-as-content variable has an average of 1.9 statements per ten minutes under a standard deviation of 2.33 (range, 0 to 8 statements per ten minutes). The variable self-as-context has an average of 3.8 statements per ten minutes under a standard deviation of 2.39 (range, 1 to 7 statements per ten minutes). The variable self-rules has an average of 0.9 statements per ten minutes under a standard deviation of 1.1 (range, 0 to 3 statements per ten minutes). Likewise, the variable oriented rules was emitted once for only one participant (See Table 4).

In relation to the post-test for the control group, the self-as-content variable has an average of 1.3 statements per ten minutes under a standard deviation of 0.9 (range, 0 to 2 statements per ten minutes). The variable self-as-context has an average of 2 statements per ten minutes under a standard deviation of 1.7 (range, 0 to 5 statements per ten minutes). The variable self-rules has an average of 0.9 statements per ten minutes under a standard deviation of 0.73 (range, 0 to 2 statements per ten minutes). Likewise, the variable oriented rules was emitted six times for only one participant (See Table 5).

A Wilcoxon test indicated that the median post-test results were statistically significantly higher than the median pre-test results for the variable self-as-context in the ACT group  $Z = -2.0$ ,

$p = .042$ . In other words, the brief defusion plus deictic frames protocol did show a significant effect in increasing the number of self-as-context statements (Pre-intervention:  $Mdn = 1.8$ ,  $SD = 1.68$ ; Post-intervention:  $Mdn = 3.8$ ,  $SD = 2.39$ ). However, the results were not significant in reducing the number of self-as-content statements (Pre-intervention:  $Mdn = 2.7$ ,  $SD = 2.54$ ; Post-intervention:  $Mdn = 1.9$ ,  $SD = 2.33$   $Z = -.954$ ,  $p = .340$ ). Overall, after the implementation of the brief protocol, 7 participants increased the frequency rate of the self-as-context statements and only one showed a decrease in the frequency rate of this variable. In relation to the variable self-as-content, 4 participants decreased the frequency rate and 2 increased the frequency rate of this variable.

In the control group, it is evident that when comparing the pre- and post-test measurements, 2 participants increased the frequency rate of the self-as-context statements and 4 showed a decrease in the frequency rate of this variable. In relation to the self-as-content variable, one participant decreased the frequency rate and 4 participants increased the frequency rate of this variable.

However, a Mann-Whitney test indicated that the self-as-context results were equal for the treatment group ( $Mdn = 3.5$ ) and the control group ( $Mdn = 1.5$ ),  $U = .27$ ,  $p = .089$ . In other words, those changes did not reach the statistical significance when comparing the post-tests scores between the treatment and control group. In general, the data show significant changes in the treatment group in relation to the variables self-as-content and self-as-context; however, the changes were not significant enough to demonstrate a behavioral change when compared to a control group.



## CHAPTER 4

### DISCUSSION

This study achieves the two objectives; first, to extend the studies on the codification of verbal behavior associated with the development of the self, and second, to evaluate the effects of a brief protocol of defusion and perspective taking on the statements associated with self-as-content, self-as-process, and self-as-context, to diminish the psychological suffering derived from the literalization of the psychological content.

In relation to the codification of the verbal behavior, the sessions were recorded and then transcribed and coded by two independent observers. The process of transcribing each 10-minute interview took approximately one hour per session, since the fluency and clarity of the participants' verbal response was not high. In addition, the process of coding the interviews took more than 20 minutes per session. Taking into account that this study made a comparison between medians of statements related to the development of the self with a sample of 20 individuals, the work of transcription and coding was possible thanks to the work of three people over three months. It is recommended that, in future investigations, less than three types of verbalizations be made and the analysis focus on the statements related to self-as-content and self-as-context, since the variations and the frequency of self -rules and control-oriented rules is low. Likewise, the rules set forth by the participants may be implicit, explicit, precise and imprecise; therefore, it is recommended to continue with the process of strengthening the definition of complex verbal behaviors.

Although the definitions of self-as-content and self-as-context determined by Atkins and Styles (2016) were used, it was necessary to implement two training sessions for the coders since, the participants emitted verbal behaviors that partially complied with the definitions; for

example, if the interviewer asked how the participant describes himself, the participant could respond "stupid," "isolated", and "autistic"; and the definition of self-as-content required the participant to mention the pronoun "I" in a frame of coordination with the psychological evaluative content located HERE and NOW. Because the definition includes both, the pronoun and the self-evaluation, some instances of self-evaluations that did not include the subject were not measured as responses. However, the use of continuous training throughout the study is a factor that facilitates maintaining the reliability of the measurement and it is recommended that, in future studies, training be carried out before and during the study, so that the coders maintain a high level of reliability in the measures. In addition, based on the results of this study and the suggestions of Sancho (2011), it is recommended to continue with the purification of verbal behaviors encoded in clinical contexts.

The verbal reports of the participants of this study match the description of self-awareness provided by Dymond & Barnes (1997), since each description of themselves required a distinction between the emission of a behavior in a given context, and the verbal behavior of reporting that the individual emitted that behavior in the given context.

Regarding the second objective of this study, the null hypothesis established for the study was that the implementation of a short protocol of defusion and deictic frames maintains the rate of verbalizations of self-as-context in individuals with disabilities. Likewise, the alternative hypothesis established for this study was that the implementation of a brief protocol of defusion and deictic frames increases the rate of verbalizations of self-as-context in individuals with disabilities.

Overall, the covariation between the verbal behaviors analyzed and the implementation of the brief protocol of defusion and deictic frames demonstrates that the statements related to the

development of the self are susceptible to be modified through defusion exercises in combination with exercises of deictic frames. The implementation of the ACT protocol did produce an increase of self-as-context statements and a decrease in the self-as-content statements for the treatment group. The results of the Wilcoxon test comparing the pre-test and post-test scores for the treatment group reject the null hypothesis stated for this study. After the implementation of the brief ACT protocol, 7 participants increased the frequency rate of the self-as-context statements and only one showed a decrease in the frequency rate of this variable. In relation to the variable self-as-content, 4 participants decreased the frequency rate and 2 participants increased the frequency rate of this variable. In conclusion, this preliminary study shows that the ontogenetic contingencies established in the ACT session can modify the response rate of verbal behaviors related to the self.

However, those changes did not reach the statistical significance when comparing the post-test scores between the treatment and control group. In other words, the effects produced by the brief defusion and deictic frames protocol were not significant when they are compared with the results of the control group. When implementing the study, both groups were equivalent and showed similar frequency rates, which ensures that the comparison between nonparametric groups can be carried out. However, the power of the test used is limited by the size characteristics of the sample used. For this reason, it is recommended that future research use a group design with a larger sample or use a unique case design that allows the evaluation of the covariation between defusion exercises and perspective taking and verbal behaviors related to development of the self.

In conjunction with the studies of Atkins & Styles (2016) and Foody, Barnes-Holmes, Barnes-Holmes, and Luciano (2013), this study is preliminary and corresponds to a relatively

new field within CBS. Given these conditions, multiple limitations must be taken into account. First, the size of the sample used is small and requires that the changes in the control group be large to obtain statistical significance. Because the implemented protocol is a brief combination of two defusion exercises and an exercise of deictic frames establishing distinction and hierarchy frames, the expected changes were not large enough to show statistically significant changes in independent samples. However, it is possible to show statistically significant changes between dependent samples (changes between the pretest and post-test measurements of the treatment group).

Second, the intervention session is too short to show a broader change in the verbal behavior of long-term participants. Although the use of these exercises was promoted in everyday situations, it is necessary to implement a protocol that has a greater effect on the verbal behavior of the participants. It is recommended to use different metaphors and defusion exercises in conjunction with the use of deictic frames in future research aimed at increasing the statements related to the self-as-context.

Third, an evaluation of social validation of the procedures used was not carried out. Therefore, there is no quantitative data on the perceived effectiveness and satisfaction of the participants. However, the anecdotal information provided by the participants focuses on the recommendation to continue using the chessboard and chess pieces to understand the metaphors used and to facilitate the distinction between private events and the self.

## EXHIBITS

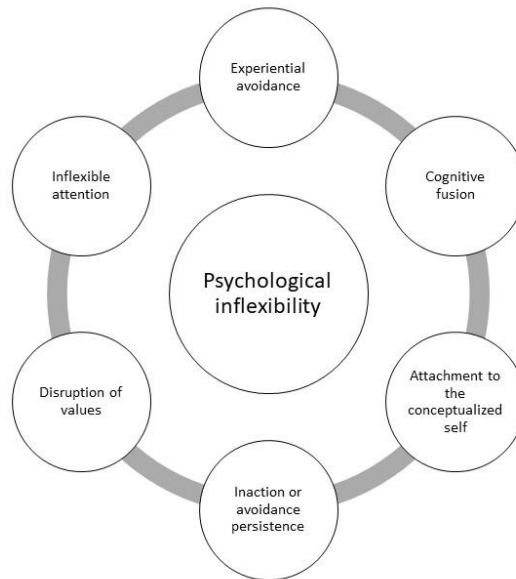


Figure 1. Psychological inflexibility model

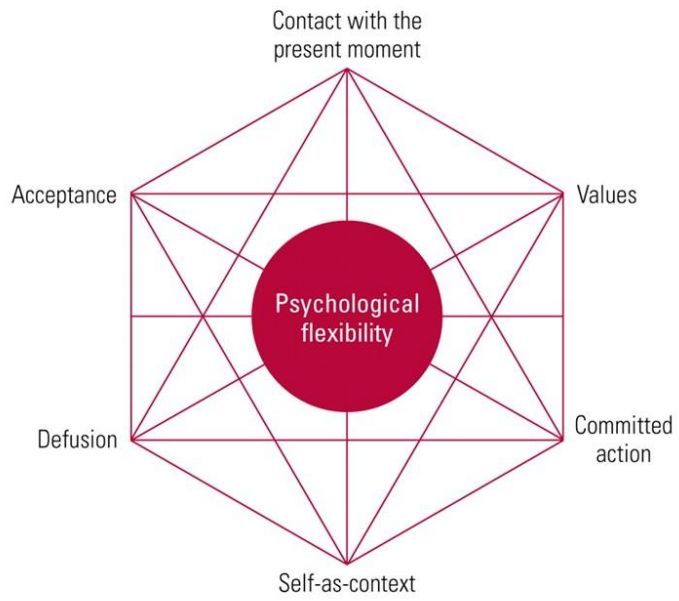


Figure 2. Psychological flexibility model

### Distribution of disabilities

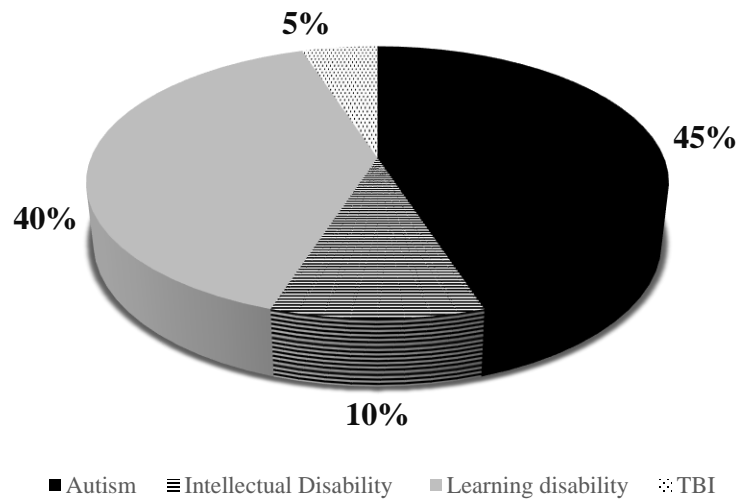


Figure 3. Distribution of disabilities

Table 1. Participants in the study

<b>Participant</b>	<b>Age</b>	<b>Gender</b>	<b>Diagnosis</b>
1	20	Male	Learning disability
2	19	Male	Intellectual Disability
3	21	Male	Autism
4	20	Female	Learning disability
5	19	Male	Learning disability
6	18	Male	Learning disability
7	22	Male	TBI
8	22	Female	Learning disability
9	18	Female	Intellectual Disability
10	18	Male	Learning disability
11	19	Female	Learning disability
12	14	Male	Autism
13	13	Male	Autism
14	20	Male	Autism
15	21	Female	Learning disability
16	21	Male	Autism
17	21	Male	Autism
18	19	Male	Autism
19	19	Male	Autism
20	27	Female	Autism



Table 2. Descriptive statistics for age

<i>Age -Descriptive statistics</i>	
Mean	19,6
Standard Error	0,6
Median	19,5
Mode	19,0
Standard Deviation	2,9
Sample Variance	8,4
Kurtosis	2,6
Skewness	0,0
Range	14,0
Minimum	13,0
Maximum	27,0
Sum	391,0
Count	20,0

Table 3. Frequency of self-statements

<i>Frequency of self- evaluations</i>	<i>Number of participants on each Treatment</i>	
	ACT	Control
More than 10	2	1
6 to 10	3	3
1 to 5	5	6

Table 4. Pre-test results for treatment group

PRE-TEST				
	SELF AS CONTEXT	SELF AS CONTENT	SELF RULES	CONTROL ORIENTED RULES
1	3	1	0	0
2	0	0	0	0
3	0	2	0	0
4	2	1	0	0
5	2	2	0	0
6	3	2	1	0
7	4	1	0	0
8	0	6	0	0
9	4	4	2	0
10	0	8	2	0

Table 5. Pre-test results for control group

PRE-TEST				
	SELF AS CONTEXT	SELF AS CONTENT	SELF RULES	CONTROL ORIENTED RULES
1	4	1	0	0
2	3	1	1	0
3	4	3	4	0
4	1	0	2	0
5	1	1	0	0
6	1	1	0	0
7	1	1	0	0
8	2	2	1	0
9	6	2	0	0
10	2	1	0	0

Table 6. Post-test results for treatment group

POST-TEST			
SELF AS CONTEXT	SELF AS CONTENT	SELF RULES	CONTROL ORIENTED RULES
3	0	0	0
3	1	0	0
1	2	0	0
7	1	0	0
5	1	0	0
1	2	3	0
4	1	2	0
7	0	1	1
6	8	2	0
1	3	1	0

Table 7. Post-test results for control group

POST-TEST			
SELF AS CONTEXT	SELF AS CONTENT	SELF RULES	CONTROL ORIENTED RULES
4	0	1	0
3	0	2	0
0	1	0	0
1	0	1	0
1	2	1	0
0	1	2	0
2	1	0	6
3	2	1	0
5	1	1	0
1	1	0	0

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## APPENDICES

## APPENDIX A

### INTERVIEW SAMPLE QUESTIONS

- **Therapist:** “I want you to describe me the main reason to came to Club 57. Why do you want to participate in our groups?”
- **Therapist:** “Please describe me a situation in which you experience the ...”
- **Therapist:** “Which were your thoughts during the situation? Can you describe me how do you feel during that moment?”
- **Therapist:** “Can you tell me why this particular thought is more uncomfortable for you than some of the others / what makes this thought/emotion so difficult for you?”
- **Therapist:** Under which situations do you think you are ...?
- **Therapist:** do you have any strategies to change that situation? What strategies could be effective?

## APPENDIX B

### Procedural integrity checklist

Item	YES	NO
The experimenter described the session at the beginning		
Brings all materials needed for the session		
Ask questions related to emotions		
Ask questions related to thoughts		
Ask the participant to describe themselves		
Ask the participant to describe strategies to manage unworkable thoughts and feelings		
ACT session: The participants described the chessboard and furniture metaphors		
Control: The participant did not use defusion exercises or deictic frames with participants		
<b>Total</b>		

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