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## Quantitative and Qualitative Evaluation of LuBAIR™ Paradigm

An Innovative Approach to Ascribing the Meaning of  
Behavioral Expressions in Persons with Neurocognitive Disorder

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# Quantitative and Qualitative Evaluation of LuBAIR™ Paradigm: An Innovative Approach to Ascribing the Meaning of Behavioral Expressions in Persons with Neurocognitive Disorder

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*Abstract.* Varied dementia care approaches have been posited (PIECES™, GPA™, Dementiability™, and Teepa Snow Dementia Workshops™) to offer direction on managing behavioral expressions (BE) in persons with neuro-cognitive disorders (PwNCD). LuBAIR™ Paradigm is the first approach to offer a specific framework to ascribe meaning to each phenotypic cluster of BE in PwNCD. The results of quantitative and qualitative measures used to evaluate LuBAIR Paradigm in clinical workshop settings, for frontline healthcare staff, are presented. Quantitative evaluation was conducted using three specific questions—does LuBAIR Paradigm offer a “better understanding of brain and behaviors,” “better understanding of meaning of behaviors,” and “better assistance in behavioral care planning”—when compared to the existing approaches in dementia care. Qualitative evaluation was based in thematic analysis of the descriptive feedback from the attendees at the workshop. The total number of attendees at the workshop for the years 2017, 2018, and 2019 were 185. Quantitative evaluation revealed that 98.4 percent of the attendees found LuBAIR Paradigm to assist in “better understanding of brain and behaviors,” 98 percent in “better understanding of meaning of behaviors,” and 92 percent in “better assistance in behavioral care planning” for PwNCD. Thematic analysis re-iterated the same strengths of LuBAIR Paradigm in its role in assessing and managing BE in PwNCD. LuBAIR Paradigm offers a distinct and a focused approach in assessing and managing BE in PwNCD.

*Keywords:* LuBAIR™ Paradigm, Behavioral Expressions (BE), Persons with Neuro-Cognitive Disorder (PwNCD)

## Introduction

Terminology used to label “agitation” in persons with NCD (PwNCD) has always reflected the models posited to conceptually understand their presence. As an example, some of the earliest terminologies used to label “agitation” in PwNCD were “disruptive” or “disturbing” behaviors (Ballard, Gray, and Ayre 1999; Cohen-Mansfield et al. 1986; Cohen-Mansfield 2000; Cohen-Mansfield 2003; Cohen-Mansfield, Werner, and Marx 1989). Accordingly, the models generated to support this terminology by Fabiano (1996) took the form of “behavioral disinhibition” model or the “behavioral disinhibition” paradigm by Russo-Neustadt and Cotman (1997) and Sweet et al. (1997). These models propose that the manifestation of non-cognitive symptoms in PwNCD is due to patho-physiological changes in the brain structures (Russo-Neustadt and Cotman 1997; Sweet et al. 1997). According to this model, a “circumstantial episode” (any situation that further confuses a cognitively impaired individual) further heightens the sense of loss of control by the individual with NCD, thereby escalating their state of anxiety to a state of panic (Fabiano 1996). The “circumstantial episode” could include alterations in one’s own actions or thoughts, the actions of others, or perturbation in the environment. The outcome is the occurrence of “aggressive, wandering, calling out or withdrawn” behaviors (Fabiano 1996). Furthermore, any of these behaviors, can act as a circumstantial episode, thereby perpetuating the manifestation of any of the aforementioned behaviors. Both the terminology and the model reflected “the caregiver’s view more than the cognitively impaired (CI) person’s perspective in a given situation” (Pulsford and Duxbury 2006, 612). Hence, this approach to conceptualizing behaviors results in labeling them as

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“disruptive” or “disturbing” for their mere presence. As is obvious, this approach to understanding the occurrence of behaviors has negative connotations and is purely from the caregiver’s point of view.

Algase et al. (1996) proposed a major shift in the way the presence of behaviors in PwNCD was conceptualized. In accordance with this model, the framework proposed that there was purpose and a reason, or a meaning, for the presence of behaviors in PwNCD. Instead of labeling these behaviors as disruptive or disturbing, thereby viewing them as bothersome to the caregivers, their presence was viewed as representation of the unmet needs of the PwNCD and their inability to make their needs known. It was further hypothesized that a single unmet need could lead to a cascade of unmet needs, thereby exponentially escalating the manifestation of the behaviors. The shift was from viewing behaviors as the problem to behaviors being indicative of any underlying problem. Therefore, the focus of intervention shifted from a targeted symptomatic management of the behaviors over to the identification, and management, of the unmet needs—the underlying reasons for the presence of behaviors. The proposal to conceptualize behaviors in this context was for them to be viewed as meaningful and their care planning approached accordingly. It offered a pro-active framework to identify the unmet needs in these individuals who may be at the highest risks of manifesting behaviors. Kovach et al. (2005) expanded on this model by identifying added factors involved in the genesis of behaviors in dementia; labeling their model. “Consequences of Need-Driven Dementia-Compromised Behaviors” (C-NDB) (Kovach et al. 2005; Kovach and Schlidt 2001; Kovach and Wells 2002). However, the conceptual understanding for the presence of behaviors was still based in unmet needs.

With the shift in the philosophical paradigm from viewing the behaviors as problems to being a consequence of unmet needs, subsequent literature has attempted to offer further direction in understanding the meaning for their presence. The PIECES™ model of approaching the assessment of behaviors in dementia was one of the first models to offer additional direction on identification of the contributory variables for the presence of behaviors in PwNCD (PIECES n.d.). The “S” in PIECES was initially established to focus on the “Social” variables and their contributory role in generation of behaviors. Subsequent modifications of PIECES model added “S” to represent “Self,” which directed us to understand more about the individual characteristics of the person with NCD. This concept received further support in GPA philosophy by applying the concept of personhood to individuals who develop dementia (Speziale et al. 2009). Personhood, as defined in the literature, is “the state or fact of being of an individual or having individual characteristics and feelings.”<sup>2</sup> The knowledge base learned from these two philosophies has been incorporated in the development of the day-to-day clinical care pathways in caring for PwNCD. Additional approaches developed, with an attempt to further expand on the concept of meaning, included DementiAbility (n.d.) and Teepa Snow Dementia Workshops (Positive Approach to Care 2020). While these current approaches are enriching the field of dementia care, they all fail to offer a specific framework to assist in ascribing the meaning for the individual constellation of, or clustering in constellation of, varied phenotypic presentation of behavioral expressions (BE) in PwNCD.

Adhering to the principles of positing a framework for understanding the meaning for the presence of BE in PwNCD, a book was published by the author titled *The Meaning of Behaviors in Dementia/Neurocognitive Disorders: A New Biopsychosocial Model and a Classification of Behaviors in NCD* (Luthra 2014). This book has formed the basis for generation of Luthra’s Behavioral Assessment and Intervention Response (LuBAIR) Paradigm; a new approach to understanding the meaning of BE in PwNCD. LuBAIR Paradigm has evolved through the years and the subsequent versions of it are available for review on various social media sites, including YouTube (Luthra 2017) and [www.dementiabelaviors.com](http://www.dementiabelaviors.com) (Luthra 2019).

<sup>2</sup> <https://www.dictionary.com>. Accessed January 1, 2021.

LuBAIR Paradigm was offered in the format of full-day workshops to frontline staff working in long-term care homes (LTCH) in Hamilton and Guelph, Ontario, Canada. All of these staff members have had exposure to various dementia care philosophies (PIECES, GPA, Dementiability, and Teepa Snow Dementia Workshops). The primary purpose of hosting the workshops on LuBAIR paradigm with the staff who have had so much exposure and training, on varied aforementioned philosophies, was to evaluate if it offered additional learning in the area of brain and behaviors, assist in ascribing meaning to behaviors, and an additional skill set in behavioral care planning in caring for PwNCD. These questions formed the core structure of the quantitative evaluation of the workshops. In addition to the three primary questions, the participants were encouraged to offer written, descriptive feedback of their experience from participation in the workshops. Thematic analyses of the additional written, descriptive feedback formed the basis to the qualitative evaluation of LuBAIR Paradigm. The results of the quantitative and the qualitative evaluation of the LuBAIR Paradigm by the participants in the workshops are being shared in this manuscript.

## Study Design

Full-day workshops were conducted on LuBAIR Paradigm for the front line staff working in the area of dementia care, in two large cities in the “golden horseshoe” area of Ontario, Canada. The vast majority of the staff who attended the workshops work at long-term care homes (LTCH), though staff working at specialized dementia care facilities and those working with dementia care in individual’s homes also attended. All the staff in attendance had received extensive training in PIECES and GPA dementia care philosophies over the duration of their employment at their places of work. Additionally, all the attendees receive refreshers on PIECES and GPA care philosophies on a regular basis. The workshops on LuBAIR Paradigm were held on several occasions in 2017, 2018, and 2019. The workshops were formatted into three segments; the first segment focused on “Brain and Behaviors,” the second segment focused on “Behaviors based in Impairment in Regulation of Sensorium as well as Impairment in the Information Processing and Motivational Circuits,” and the third segment focused on “Behaviors based in Impairment of Emotional Regulatory and Self-Monitoring and Regulatory Circuits.” The attendees were offered directions on the format of the evaluations at the beginning of the day, with regular reminders between each of the three segments, in order to complete the evaluations at the end of the day.

## Methodology

The evaluation of the workshop was done on, both, quantitative as well as qualitative domains. The primary goal of the evaluation was to assess if LuBAIR Paradigm added to the knowledge base of the attendees over and above their current knowledge base acquired from PIECES and GPA training and exposure to any other philosophies in dementia care.

The quantitative evaluation was achieved by asking three very specific questions. Does the LuBAIR approach provide you with:

1. A better understanding of “Brain and Behaviors”?
2. A better understanding of “Meaning of Behaviors”?
3. Better assistance in “Behavioral Care Planning”?

Simple percentages were calculated on the responses received, which were “yes,” “no,” or “unsure,” to the questions put to the attendees.

The qualitative evaluation was based in thematic analyses of the written, descriptive, feedback offered by the attendees. The written, descriptive data from the workshops conducted over the years 2017, 2018, and 2019 was pooled for the analysis. A deductive approach with the

key-words-in-context (KWIC) methodology was used for the thematic analysis of the written feedback (Fereday and Muir-Cochrane 2006). The following steps were undertaken to analyze the pooled raw data:

1. Familiarization of collected data.
2. Generating initial codes.
3. Searching and reviewing themes.
4. Presenting write up and results.

As is often the case, the attendees at the workshops offered written feedback on the content of the workshops, the performance of the speaker, and the format of the workshops. The feedback on the speaker and format of the workshops were excluded from the analyses and the focus of the thematic analyses was primarily on the feedback offered on the content of the workshop.

## Results

For the year 2017, seventy-nine healthcare professionals attended the workshops. For the year 2018, forty-six healthcare professionals attended the workshop. For the year 2019, sixty healthcare professionals attended the workshop. The total number of attendees, for the accumulative three years of workshops, was one hundred and eighty-five.

Table 1: Quantitative Responses, Expressed as Percentages, to the Questions for Years 2017, 2018, and 2019

	<b>Total number (2017–2019) 185 Participants</b>	<b>Percentage (2017–2019)</b>
A better understanding of brain and behavior	Yes 182 No 0 Unsure 3	Yes 98.4% No 0 Unsure 2%
A better understanding of the meaning of behaviors	Yes 181 No 0 Unsure 4	Yes 98% No 0 % Unsure 2%
Better assistance in behavioral care planning	Yes 170 No 4 Unsure 11	Yes 92% No 2% Unsure 6%

Source: Luthra 2020

Table 2: Raw Data of the Descriptive Feedback from the Attendees at the Workshop for the Years 2017, 2018, and 2019

<p>Love the anatomy and physiology of the Brain. Educated on the correlation between how the brain responds as it changes and how the behaviors are a reflection of the brain changes. Understand more about how the brain works and how it affects behavior. Realize how important to know the client/patient history for formulating interventions. Great way to break down complex concepts into easier to understand terms. To break down complex concepts into easy to understand terms. Received more information than expected. Lot of valuable information for Me to keep and refer to when I need help. The same examples with slightly different analysis that we usually use. Valuable information to better the quality of the lives of the residents. Very informative and thorough. Helped better understand the chain reaction of how the circuits work. Definitely learned some new things that I have never considered before. Focused on not lobes .... How the circuits in the bran effect each other. Has provided me with another great tool. Learn a lot about Behavior and how to deal with it in a right way. Good information to take back. Makes a lot of sense. Very informative. Information to take back.... put into practice when working with clients. Really helped to bring a concept to life. A lot of much needed info.</p>
<p>I am seeing a lot of my residents in the different behaviors. Helpful to understand ‘behaviors’ behind what happens to a person who is demand and what they are feeling. Got more understanding on the types of behavior I dealt with at my workplace. Informative, learned more about behaviors of residents with whom I work. Can help me by understanding them. Helped bring prospective to behaviors. Great insight, Taught us to look underneath and not assume. Allowed me to rethink my previous misconceptions about the behaviors of people with dementia. Allowed me to understand how behaviors developed. Learning with a better understanding on how the come together. Better understanding overall. In depth, complex, but makes sense of Dementia and behavior we manage. Helpful information to teach my staff why these behaviors exist. Many employees personalize the behaviors. This information will be valuable to share with staff so is not to take things personally. Helpful to understand the underlying causes for behavior, Very informative. Easy to understand the “meaning” of behaviors. Great breakdown of the reasons behind the behaviors. Works well in combination with other programs. Other programs are great for PSW level. PIECES and today’s session are great for registered staff. Everything just clicked. Would like front line staff to see this presentation. Great information. This is how all people with dementia should be supported. Excellent information regarding meaning of behavior. Overall very informative. Easy translations of behaviors for family to understand. Complements GPA.</p>
<p>Will certainly use the LuBAIR inventory and share with my colleagues &amp; BSO team, LTC facilities, &amp; acute settings. Principle’s” to individualized and build on. Information. Helpful to recognize patient’s behaviors. Time we get back to the Basics and stop labelling PwD with behaviors but instead understand what their expressions are telling. Made me look at care in a different light as to why certain expressions happen and how to approach care. Lots of valuable information for Dementia. Provide a better understanding. Makes more sense with each examples and scenario – interesting as always. Valuable insights to be used in our practical everyday interactions. Great resource, made tons of notes and will refer back to it in the future.</p>
<p>Has helped me to learn the different methods of approaching and how to effectively deal with certain situations. Beneficial in approach to care. Approaches to care helped my PSW validate what they are doing. Brain + Behavior has link the why to the behavior. How to apply to practice, specific techniques to use, and solutions. Appreciate the discussion on approach to care. It will really help me in my approach to resident’s behaviors. Gained insight into emotional needs, how this may have been developed (?) in early development and the meaning of needs. Please, continue to provide more educational sessions. Very informative - received more information than expected. This session was best please do more of this educational sessions. Useful subheadings for care plan for behaviors. I have learned new strategies that I will use in my practice I liked how the approach to care was identified. Works well altogether! Meaning of behaviors. Behavioral care planning enhances abilities to search out that person’s need for sure – great additional step. Very informative. Broken down into more sensitive approach to non-pharm interventions Very useful and valuable information Very informative and highly useful information. New &amp; fresh perspective learnt tons! Hoping to use LuBAIR Inventory in my assessments of patients, I work with. I really learned a lot. Have learnt invaluable information today.</p>

Source: Luthra

Table 3: Worksheet of the Thematic Analyses Conducted on the Raw Data

<i>Data Extraction</i>	<i>Codes</i>	<i>Write-Up</i>
Understand...Correlation. Brain Changes ...Behaviors Changes. Understand. Brain works. Effects Behavior. Break down. Complex Concepts. Easier ...Understand. Complex concepts...Easy...Understand. Understand...Chain reaction. Circuits work. Not lobes...Circuits...Brain...Behaviors. In depth. Complex...Sense...Dementia...Behavior Brain + Behavior...Why...Behavior	Complex Brain Behavior Understanding Circuits Easy	Simplified and enhanced understanding of brain and behaviors
Great...Registered staff. Works well altogether! Great additional step. Complements GPA  Better understand...chain reaction...circuits work. Understand "behaviors." Behind what happens...what they are feeling. More understanding. Types of behavior. Help me ...understanding them. Bring prospective. To behaviors. Great insight...look underneath...Not-assume. Rethink...previous misconceptions. Understand... Behaviors...developed. Better understanding...how they come together. Better understanding overall. Understand...the underlying causes. For behavior. Understand ..."meaning"...meaning of behavior. Behaviors...Family...to understand. Information...better understanding. Makes ...sense. Valuable insights...Gained insight...meaning of needs.  Deal with...the right way. Different methods of approaching ...effectively deal with certain situations. Beneficial ...approach to care. Approaches to care...PSW validate what they are doing. Apply to practice...specific techniques...to use ...solutions. Appreciate...approach to care. Really help ...approach to...how to...approach care. Valuable insights ...to be used...practical everyday interactions. Useful subheadings...care plan. Learned new strategies...use ...practice. How...approach to care...identified. Enhances abilities...person's need...for care. Identified...care planning. Assist...my practice	Exhaustive Informative Recognition Share  Different New Rethink Fresh  Complimentary Additional Altogether	Comprehensive approach to labelling behaviors  Innovative approach to dementia behaviors  Compliments existing approaches
More...Information...than expected. Valuable information. Refer...when...Need help. Valuable information...Better...Very informative...Thorough. Learn a lot...Deal...The right way. Information. Makes...Sense. Very informative...Much needed. Information to take back...put into practice. Helped...bring...concept to life. Helpful information...Teach my staff. Very informative. Everything just clicked...Great information. Excellent information Overall very informative. Seeing...lot of my residents...Different behaviors. Informative...learned. Same examples...different analysis. Learned...new things...never considered. Provided...another...Tool. Rethink ...Misconceptions Bring...concept...To life. Learn...Different methods...Approaching...New strategies...Use...New...fresh ...perspective. Look at care...In different light. Another tool ...Practical...helpful. Works...Combination...Other programs. Other...PSW level. PIECES...Today's session	Understand Insight Sense 'Meaning'  Approach Care Effective Enhanced Beneficial Valuable	Increased insight into understanding of 'meaning'  Augments approach to care

Source: Luthra

The final write-up of the thematic analysis can be summarized as follows: An innovative, simplified, enhanced, and comprehensive approach to understanding the reasons for the occurrence and recognition and labeling of behaviors in PwNCD. This approach offers increased insight into the understanding of “meaning” of behaviors in PwNCD. This approach complements the existing paradigms and further augments the approach to behavioral care planning in PwNCD.

## Discussion

Varied philosophies on approach to assessing and managing BE in PwNCD have been proposed through the years, but the relationships among them lacks clarity. Is the relationship among them supposed to be complementary or competitive, remains undetermined? In the author’s opinion, PIECES philosophy is the critical, and essential first step in assessing non-cognitive symptoms in PwNCD. PIECES philosophy brings uniformity to the initial step in identifying, and addressing all the contributory variables prior to labeling the non-cognitive symptoms as behavioral disturbances, and in accordance with DSM-5 (American Psychiatric Association 2013). The remaining philosophies (GPA, Dementiability, and Teepa Snow Dementia Workshops) offer similar, maybe even competing, approaches and leave healthcare staff with lack of direction on which of these philosophies is to be applied for which constellation of behaviors. Perhaps personal preferences determine which of the philosophies are implemented for specific constellation of symptoms or in individual cases. Furthermore, there may well be other approaches developed regionally, and which have not had global exposure, not reviewed here. This level of crowdedness makes it challenging to offer yet another approach unless the new approach significantly adds to the body of knowledge and categorically distinguishes itself from the rest. Therefore, any new approach must distinctly demarcate itself to ensure any degree of traction, uptake, and penetration within the system. This was the primary reason for taking LuBAIR Paradigm to a field trial with frontline healthcare staff, who have had exposure and training in all of these varied philosophies, prior to putting it to the next stages of evaluative framework.

The quantitative results from the workshops overwhelmingly support the added usefulness of LuBAIR Paradigm in assessing and managing BE in PwNCD. The thematic analyses of the descriptive feedback re-iterated the identified strengths of LuBAIR Paradigm, with additional strength in identifying and labeling different phenotypic manifestations of BE in PwNCD and its complementary role with existing dementia care approaches (GPA and PIECES, Dementiability and Teepa Snow). Another advantage of LuBAIR Paradigm is the introduction of the concept of purpose for the presence of BE in PwNCD, in addition to offering a specific framework to ascribe meaning to them. Distinctive definitions of the terms “purpose” and “meaning” are covered below (Luthra 2014).

A brief overview and the key tenants supporting LuBAIR Paradigm are:

- a. Designed for persons in the advanced stages of NCD, when formal clinical assessment (obtaining history and conducting a mental state examination) is not reliable.
- b. Occurrence of BE in PwNCD is viewed as a normal phenomenon and their mere presence is not viewed as pathological.
- c. Severity of the BE is determined by and based in “intervention and response” to interpersonal interventions, and in accordance with LuBAIR Inventory.
- d. Risks associated with BE are determined based on Dementia Functional Assessment<sup>©</sup> approach defined under LuBAIR Paradigm, and not as defined under the Mental Health Act.

- e. LuBAIR Paradigm further supports the notion that BE in PwNCD is a mode of communication for them.
- f. A Bio-Psycho-Social (BPS) model has been posited to explain for the generation of BE in NCD, as all existing models are dichotomized along the biological and psychosocial domains. BPS model offers a structured breakdown of the variables involved in describing the concept of personhood, and as a way of enhancing its understanding.
- g. The occurrence of BE in PwNCD has a purpose and meaning.
- h. Purpose signifies how the professionals and family members, alike, are interpreting BE in PwNCD, in that given contextual environment.
- i. Meaning signifies what the PwNCD is attempting to communicate to the professionals and family members, alike, through their BE.

Once the BPS model for the generation of BE in PwNCD was posited, a new classification system was proposed. The proposed classification system is based in the development of a new functional model of the brain, under the LuBAIR Paradigm. The four psychological constructs represented in this functional model of the brain include:

1. Theories on regulation of sensorium and information processing cascades.
2. Motivational theories.
3. Theories on regulation of emotions.
4. Theories governing self-monitoring and regulation.

The newly posited framework, to justify the use of these specific psychological constructs in the development of the new functional model of the brain, is derived from the established and extensively researched psychological literature, which has been applied in varied clinical and research settings, and universally accepted (Luthra 2014; McCrae and John 1992; Smith and Buckwalter 2005). The four areas of psychology, which have been used in the development of the functional model of the brain, under LuBAIR Paradigm include: neuropsychology (theories on regulation of sensorium and information processing cascades), behavioral psychology (motivational theories), general psychology (theories on regulation of emotions), and social psychology (theories governing self-monitoring and regulation) (Luthra 2014; Agronin 1998; Chatterjee et al. 1992; Riskind and Alloy 2006).

According to the LuBAIR paradigm, each of these specific psychological constructs, which have been used to justify the existence of individual behavioral categories that encompass and represent “alike” or “similar” behavioral symptoms (Luthra 2014; International Psychogeriatric Association n.d.), offers a framework to understand the purpose and the meaning for their presence. Whereas the other dementia care philosophies offer a broad and generic approach to behavioral care planning for BE in PwNCD, LuBAIR Paradigm offers specific guidance for each and every varied phenotypic manifestation of behavioral expressions in PwNCD. LuBAIR Paradigm offers the healthcare professional (HCP) and the families a targeted approach, with an in-depth understanding of the purpose and the meaning for the presence of individual behavioral categories. Hence, the behavioral care plan derived from the application of LuBAIR Paradigm is focused and targeted to the specific behavioral symptoms, which are represented under individual behavioral categories and supported by the specific psychological constructs (Luthra 2014).

Impairment of the neuro-circuits responsible for functionality of the regulation of sensorium leads to generation of Disorganized Expressions. The impairment of sensorium leads to reduced reaction time, slowing of the processing speed, and reduction in the “chunk” of information picked up for processing. All of these aforementioned steps lead to reduced task performance, with its congruent impact on cognition and function, emotions and behaviors. Statements like “there is something different about Ms. Smith today or Ms. Smith seems more confused today” reflect reduced task performance in PwNCD. The purpose for the presence of

this behavioral category is to recognize the existence of “increased confusion from baseline” in PwNCD. The meaning ascribed to this behavioral category, and being communicated by the PwNCD, is “My body physiology has changed. Please help me find the cause.”

Impairment of the neuro-circuits responsible for the functionality of the information processing pathways leads to the generation of Mis-Identification Expressions. This leads to a breakdown in the pairing of the newly processed information with the stored information, thereby resulting in an altered sense of relatedness, and reality, between the PwNCD and their environment. The information affected by this pathophysiological process is always of great personal and emotional importance to the PwNCD (Davis, Buckwalter, and Burgio 1997). The purpose for the presence of this behavioral category BE is to recognize the existence of an alternative approach to “detection of psychosis” in advanced stages of NCD, when clinical examination is unreliable. The meaning ascribed to this behavioral category, and being communicated by the PwNCD, is “Please help me, my mental experiences are not based in reality.”

Impairment of the neuro-circuits responsible for the functionality of the motivational circuits leads to the generation of Goal-Directed, Apathy, Importuning, and Motor Expressions. A discrepancy between an individual’s internal physiological or psychological state and their milieu leads to identification of a need, which is represented as a goal, and is propelled to satiation by motivational forces (Anderson 1977; Gibson 1997). Pathophysiological changes leading to heightened levels of motivational forces results in identification of several needs, simultaneously or sequentially, thereby leading to manifestation of Goal-Directed Expressions. The purpose for the presence of this behavioral category BE is to recognize the existence of “busy beaver” states in PwNCD (Luthra 2014; Pezzulo et al. 2008). The meaning ascribed to this behavioral category, and being communicated by the PwNCD, is “Please help me belong... to family, faith, profession, life’s work, community, or ethnicity.”

Pathophysiological changes leading to varying degrees of reduced motivational forces result in an absence of identification of a need, thereby resulting in manifestation of Apathy Expression (Mega et al. 1996; Starkstein and Leentjens 2008; Landes et al. 2001; Clarke et al. 2008; Martin and Wilkosz 2005). The purpose for the presence of this behavioral category is to recognize the existence of “inactive states” in PwNCD. The meaning ascribed to this behavioral category, and being communicated by the PwNCD, is “Please help me... I lack insight into the existence of my deficits.” Pathophysiological changes leading to either normal or heightened levels of motivational forces result in Importuning Expressions. The purpose for the presence of this behavioral category is to recognize the existence of unmet basic needs. The meaning ascribed to this behavioral category, and being communicated by the PwNCD, is “Please help me identify my specific innate physiological needs.” These innate physiological needs include hunger/thirst; fatigue/need to rest; voiding/defecating; pain or discomfort/need for relief; mental/social stimulation; and need for intimacy, pleasurable needs, including sexuality. Pathophysiological changes leading to varying degrees of changes, between low to high, of motivational forces result in Motor Expressions. The purpose for the presence of this behavioral category is to recognize the existence of an unsettled state in PwNCD. The meaning ascribed to this behavioral category, and being communicated by the PwNCD, is “Please help me... I don’t understand my reasons for being unsettled.”

Impairment of the neuro-circuits involved in the regulation of emotions leads to the generation of Emotional, Vocal, and Fretful-Trepidated Expressions (Sander et al. 2005). The one consequence of the impairment in the functioning of the emotional regulatory circuits is that the generation and regulation of emotions is compromised. This phenomenon manifests itself in the form of all emotional responses increased in amplitude, prolonged in duration, and very slow to extinguish, in response to triggers. The purpose for the presence of this behavioral category is to recognize and appreciate the occurrences of, unintended, out-of-proportion emotional responses in PwNCD. The meaning ascribed to these behavioral categories, and

being communicated by the PwNCD, varies with the type of emotion being expressed. For the emotions of anger, the meaning being communicated by PwNCD is “Please see my response as defensive, and not aggressive.” For emotions of joy, the meaning communicated by PwNCD is “Please help me reign in my emotions.” For the emotions of melancholy, the meaning communicated by the PwNCD is “Please help me in my catharsis.” For the emotions of discontentment (Sander et al. 2005), the meaning being communicated by PwNCD is “Please don’t judge me... I am trying to avoid exposure to pain.” For emotions of fear, the meaning being communicated by PwNCD is “Please help me find my safe place.”

Impairment of the neuro-circuits involved in self-regulation and monitoring circuits leads to the generation of Oppositional, Physical, and Sexual Expressions (Ornstein and Gaugler 2012; Benoit et al. 2006; Greenspan 1992; Schoen 1983; Forehand and McMahon 1982). The purpose for the presence of the Oppositional Expression is to recognize the PwNCD attempts to preserve their dignity and autonomy. The meaning ascribed to this behavioral category, and being communicated by the PwNCD, is “Please support me in my independence” (Greenspan 1992; Schoen 1983; Forehand and McMahon 1982). The purpose for the presence of the Physical Expression is to recognize that the PwNCD “perceives an impediment in goal attainment and therefore, expressing negative emotions.” The meaning ascribed to this behavioral category, and being communicated by the PwNCD, is “Please help me identify the impediments to goal attainment.” The purpose for the presence of the Sexual Expression is to recognize the risk of “Don’t rush to label me” (Mahieu and Gasmans 2012; Rheume and Mitty 2008; Wallace and Safer 2009; Elias and Ryan 2011; Stubbs 2011; Benbow and Beeston 2012). The meaning ascribed to this behavioral category, and being communicated by the PwNCD, is “Please try to understand my reason for being this way, and it’s rarely sexual.”

## Conclusion

The results of the evaluation of LuBAIR Paradigm supports the added usefulness, over and above the established approaches, in assessment and management of BE in PwNCD. It is reasonable to propose that the very first step in approach to assessing BE in advanced stages of neurocognitive disorders is the application of PIECES paradigm. The purpose of this step is to identify, and treat, all possible causes for the occurrences of behaviors. Based upon the quantitative and qualitative results of this field trial, the next step in assessing and managing BE in advanced stages of neurocognitive disorders is the application of LuBAIR Paradigm in order to define the purpose and the meaning to each of the varied phenotypic manifestations in PwNCD. The recognition of the purpose and ascribing of the meaning to individual BE will facilitate development of specific behavioral care plans in their management. Where appropriate, the respectful self-protective and gentle redirection techniques for use in situations of high risks that have been developed in the GPA philosophy of dementia care may also be incorporated in the behavioral care planning. Furthermore, the results of the study offer justification for LuBAIR Paradigm to be put through the next steps of the evaluative framework. These next steps include evaluation of specific behavioral care plans for each of the established individual behavioral categories and the role LuBAIR Paradigm can play in justification for the use of atypical antipsychotics in the management of limited and specific, individual behavioral categories.

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