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Faculteit Revalidatiewetenschappen

Master in de ergotherapeutische wetenschap

Masterthesis

Exploring the depths of meaning: Disentangling the meaning in meaningful activities: a pilot study

Nicky Van Broeck

Scriptie ingediend tot het behalen van de graad van Master in de ergotherapeutische wetenschap

PROMOTOR :
Prof. dr. Dominique VAN DE VELDE

COPROMOTOR :
dr. Ellen CRUYT

2023
2024

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Masterproef ingediend tot het verkrijgen van de graad van
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Promotor: prof. dr. Van de Velde Dominique
Copromotor: Dr. Cruyt Ellen
Academiejaar 2023-2024

UHASSELT KU LEUVEN UNIVERSITEIT GENT

Dutch abstract

Introductie: Binnen de discipline ergotherapie wordt het deelnemen aan betekenisvolle activiteiten cruciaal geacht voor de gezondheid en het welzijn van een individu. Er ontbreekt echter een algemeen aanvaarde definitie van 'betekenis' binnen betekenisvol handelen. Om een stap dichter te komen bij een overkoepelende definitie, wordt volgende onderzoeksvraag toegepast binnen de pilotstudie: "Hoe wordt het aciviteitenkapitaal van een individu gecategoriseerd in verschillende *'experience based categories'* op basis van de attributen van betekenisgeving?"

Methode: Studenten vulden acht dagen lang tweemaal daags EMA-vragenlijsten in waarin ze de attributen, timing en intensiteit van de ervaren betekenis tijdens een op dat moment uitgevoerde activiteit beoordelen op een schaal van nul tot tien. Een hiërarchische clusteranalyse werd uitgevoerd om *'experience-based categories'* te identificeren. De intensiteit en timing van betekeniservaring werden geanalyseerd met behulp van een Kruskal-Wallis test en de Chi-kwadraat.

Resultaat: De auteur identificeerde zes *experience-based categories* op basis van attributen, intensiteit en timing van betekeniservaring: (1) Contextueel verrijkte activiteiten, (2) Obstakelactiviteiten, (3) Herlaadactiviteiten, (4) Veilige activiteiten, (5) Groeigerichte activiteiten, en (6) dwangmatige activiteiten.

Conclusie: De SEMA3-applicatie blijkt bruikbaar binnen het onderzoek. De vragenlijst vereist kleine aanpassingen en een meer vooraf gedefinieerde interpretatie. De *experience-based categories* dragen bij aan de voortdurende discussie over het definiëren en meten van betekenisvolle activiteiten in Occupational Sciences. Deze studie benadrukt de noodzaak van verder onderzoek om de voorgestelde categorieën te valideren.

Keywords: "Meaningful activities", "Occupation", "Experience-based categories", "Attributes of meaning", "Ecological Momentary Assessment"

Aantal woorden masterproef: 7495 woorden

Volgens de richtlijnen van Journal of Occupational Sciences

English abstract

Introduction: Within the field of occupational therapy and science, it is asserted that engagement in meaningful activities is crucial for an individual's health and well-being. Despite various attempts in the research realm, there lacks an overarching, universally accepted definition of 'meaning' within meaningful activities. To address this issue, this pilot study uses the following research question: "How is an individual's activity capital categorized into distinct experience-based categories based on the attributes of meaning?"

Method: Students (n=38) completed EMA questionnaires over eight days, twice a day, assessing the attributes, timing, and intensity of the meaning of their recently performed activities on a scale from zero to ten. A hierarchical cluster analysis was conducted to identify experience-based categories. The intensity and timing of meaning experiences were analyzed using a Kruskal-Wallis test and the Chi-square test.

Results: The author identified six experience-based categories: (1) Contextual Enriched activities, (2) Hurdle activities, (3) Recharging activities, (4) Secure activities, (5) Growth-oriented activities, and (6) Compulsive activities.

Conclusion: The SEMA3 application proved effective for this purpose. The questionnaire requires minor adjustments and a more predefined interpretation. The experience-based categories contribute to the ongoing discussion on defining and measuring meaningful activities in occupational science, setting the stage for future large-scale studies. This study highlights the need for further research to validate the proposed categories.

Keywords: Meaningful activities, Occupation, Experience-based categories, Attributes of meaning, Ecological Momentary Assessment

Word count of the master's thesis: 7495 words

By the guidelines of the Journal of Occupational Sciences

Table of contents

10. LIST OF TABLES

Foreword

Het voorbije jaar, was een jaar vol uitdagingen. Eén daar van was het schrijven van deze masterthesis. Het gebeurde meerdere malen dat ik verdwaalde in de wondere wereld van 'betekenisgeving'. Gelukkig had ik op die momenten de juiste mensen om mij heen om me een handje te helpen. Deze mensen wil ik graag bedanken.

Ten eerste wil ik mijn fantastische promotoren bedanken: Prof. dr Dominique Van de Velde en dr. Ellen Cruyt. Dankjewel voor het vertrouwen en de steun. Zowel op academisch als persoonlijk vlak heb ik veel van jullie geleerd. Jullie creeërde telkens een veilige omgeving waarin ik mijn kritische bedenkingen kon uiten en bespreken. Dit zorgde ervoor dat ik met veel plezier aan de calls deelnam en aan mijn thesis werkte. Uit dit onderzoek kan ik concluderen dat niet enkel activiteiten, maar ook personen betekenisvol kunnen zijn. Er zijn niet genoeg woorden om jullie daarvoor te bedanken. Natuurlijk wil ik ook de bachelor-, schakel- en masterstudenten bedanken voor hun deelname. Het was fijn om een week lang jullie dagboek te zijn.

Daarnaast wil ik mijn papa'tje bedanken. Jouw passie ligt in de landbouw, en de mijne binnen ergotherapie. Tijdens onze gesprekken gebeurde het vaak dat we over ergotherapie praatten in landbouwtermen. Om deze trend voort te zetten, wil ik je bedanken met volgende woorden: Op dagen dat ik dacht dat mijn oogst verloren was door donkere, regenachtige dagen, zei je altijd: "Naar mijn weten is het nog nooit oneindig lang blijven regenen". Wanneer de zon weer ging schijnen, leerde je me om hard te werken. Dankjewel daarvoor papa'tje, want daardoor kan ik nu tevreden oogsten.

Laurence, ook jou wil ik bedanken. Als het mij even te veel werd kon ik jou altijd bereiken (zelfs al dat betekende dat je een uur langer in de Delhaize moest rondlopen). Je kon mijn gemoedstoestand telkens verbeteren door mij uit te nodigen voor een "thesissessie' met als hoogtepunt jouw lasagne.

Ten laatste wil ik mijn vriend Jef bedanken. Dankjewel om geduld te hebben met mijn chaotische momenten. Dankjewel dat je telkens alles opruimde als ik alle structuur verloor. Ik beloof je plechtig dat ik je de komende weken niet meer zal lastig vallen met termen zoals 'betekenisvol' en 'Occupational Science'.

1. Contextualization

Within the Department of Rehabilitation Sciences at Ugent, foundational research is being conducted in the field of occupational therapy. Researchers are systematically addressing the semantic differentiation between the terms “activity” and “occupation” and striving to make these distinctions objectively measurable. Van de Velde (2015) authored the article “Occupation as Part of the Occupational Therapist’s Jargon: The Development of the Comprehensive Model of Occupation’ [Occupatie als onderdeel van het vakjargon van de ergotherapeut: de ontwikkeling van het Comprehensief Model van Occupatie] in which he delineated three attributes of meaningful activities: skills, challenge, and trust. These attributes are contextualized within the transactional relationship between activity, person, and environment.

In 2023, Dr. Ellen Cruyt, under the supervision of Prof. Dr. Dominique Van de Velde (Ugent) and Prof. Dr. Patricia De Vriendt (Ugent), published her doctoral thesis at Ghent University titled ‘Unraveling the concept of meaningful activities in chronic conditions’. This work aimed to uniformly define meaningful activities through a multimethod approach (Cruyt et al., 2023)

A key objective for follow-up research is to validate previous findings within a broader context. The research group intends to achieve this through a citizen science project targeting the Flemish population. The research will be conducted in collaboration with Scivil, a knowledge center for Citizen Science in Flandres, supported by the Flemish government and RVO society.

It is necessary to conduct a pilot study that demonstrates the strengths and potential improvements of the methodology. This pilot study will involve testing an Ecological Momentary Assessment (EMA) application as a data collection method and evaluating the measurement of three variables (questionnaire). Additionally, the study will attempt to establish experience-based categories related to the perception of meaning. These tasks will be undertaken as part of a master’s thesis under the guidance of Prof. Dr. Dominique Van de Velde and Dr. Ellen Cruyt, who will subsequently lead the citizen science project.

2. Introduction

Occupational science and occupational therapy are founded on the belief that people are occupational beings who need to engage in meaningful activities to maintain health and well-being (Yerxa, 1990; Wilcock, 1998). One of the founders, Meyer (1922/1977), suggested that individuals with psychiatric issues benefit from purposeful and meaningful activities by balancing work, play, rest, and sleep.

During the history of occupational therapy, the focus on working with meaningful activities fluctuated widely. Kielhofner (2009) linked these differences to three paradigms. The first is 'the paradigm of occupation,' in which occupation is still used as a therapeutic measurement scale. In 1940, occupational therapy entered a crisis where there was more reductive action with a focus on the medical world (Hocking, 2000). In the 1970s, occupational therapists discovered that this view was inadequate and started the third paradigm, namely the contemporary paradigm. The function of the concept of occupation was rediscovered and was used more than ever before in 2000 (Bauerschmidt & Nelson, 2011). In 2014, Gustafsson et al. concluded that the discipline of occupational therapy was once again at a crossroads in which Evidence-Based Practice (EBP) takes center stage. The researcher calls for decisions regarding EBP to be made with the contemporary paradigm in mind.

This paradigm consists of three essential foundations: the importance of occupation to health and well-being, recognition of occupational problems and challenges; the defining feature and core of occupational therapy practice is using occupation to improve health status (Kielhofner, 2009, p.49; Joosten, 2015). Within the introduction, the importance and definition of occupation, or in other words, engagement in meaningful activities, is examined. From this, current challenges are uncovered.

2.1. Importance of meaningful activities

2.1.1. Meaningful activities and health

Before the impact of an individual's engagement in meaningful activities is tested on their health, it is important to get a clear vision of what health is. The World Health Organization

(WHO, 1946, p.100) defines health as follows: *"Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity"*. Huber (2013, p.53) takes a more nuanced definition and talks about the term "positive health" with the following definition: *"Health as the ability to adapt and to self-manage in the face of social, physical, and emotional challenges.*

Engaging in meaningful activity requires stability. Self-management should be continuously supported by meaningful activities, as positive health is a process rather than an endpoint (Huber, 2013). The goal of an occupational therapist is to create opportunities for individuals to engage in these forms of occupation (Meyer 1922/1977, Huber 2013, p.53). Reilly (1962, p.2) described this phenomenon as early as the beginning of occupational therapy with the following quote: "That man, through the use of his hands as they are energized by mind and will, can influence the state of his own health".
The evidence is also reflected in practice where older people participating in social and productive activities have a higher survival rate (Glass et al., 1999). Finding meaning in daily activities, in turn, leads to successful aging (Ciro & Smith, 2015).

However, there is no established one-way causal relationship, as meaningful engagement promotes health, but health is also a daily resource that an individual uses to engage in meaningful activities (Pizzi & Richards, 2017). Participation in meaningful activities is seen, on the one hand, as a process that leads to health. On the other hand, engaging in meaningful activities can also be seen as the outcome (Pierce, 2001; Royeen, 2002).

2.1.2. Meaningful activities and well-being

Meaningful activities are a useful variable regarding the influence of meaning on well-being. They have a more significant impact on well-being than personal characteristics (Eakman & Eklund, 2012; Steger & Kashdan, 2013). If an individual is limited in participating in meaningful activities, this results in a decrease in their mental health and causes distress (Deckert et al., 2018; Cruyt et al., 2021). The absence of meaning can even lead to depression (Lyu et al., 2023). A low awareness of opportunities and functional limitations are barriers to engaging in meaningful activities. This leads to a less meaningful life and a lower quality of life (Ciro & Smith, 2015; Loh et al., 2021; Kreiss & Schnell, 2022).

2.1.3. Meaningful activities and identity

Participation in meaningful activities enables individuals to achieve cultural or personal goals and facilitate self-transformation through specific behaviors (Ciro & Smith, 2015; Hocking, 2000). This uniqueness in performance and the associated meaning shapes and preserves identity. However, the meaning of these performances is often unstable, with individuals developing new meanings for activities based on their interpretation of previous personal experiences (Nelson, 1988; Hocking, 2000; Kreiss & Schnell, 2022)

There is a profound intrinsic connection between meaning, quality of life, and personal growth (Roberts & Bannigan, 2018; Kreis & Schnell, 2022; Carreno et al., 2023). This connection also empowers individuals to fulfill specific roles (Hocking, 2000; Deckert et al., 2018), thereby promoting self-confidence and self-assurance (Cook & Thompson, 2015). Thus, engaging in meaningful activity not only enhances overall well-being but also supports personal identity.

2.1.4. The importance of a definition

Meaning-making involves a top-down approach in an individual's life course. When this concept is better understood, individuals are more likely to actively seek out meaningful activities in their daily lives (Kreiss & Schnell, 2022). To experience the effects of meaningful activities, it is essential to define personal meaning-making in daily life activities (Steger & Kashdan, 2013). Understanding meaningful activities provides opportunities to explore "the dark side of occupation," where Twinley (2012) suggests that, for example, an unhealthy, illegal activity can be meaningful to an individual.

2.2. Definition

As seen in the previous paragraph, a clear delineation of meaningful activities is necessary. Van de Velde (2015, p.13) defined the construct: "An occupation is a unique, unpredictable experience of a person that takes up time and space during the performance of activities and leads to meaning and personal identity." The American Occupational Therapy Association (AOTA 2020, p. 1) describes occupation as "...the activities that people do every day to give their life meaning and purpose." Both definitions incorporate the concept of meaning.

According to the Value and Meaning in Occupations (ValMO), this meaning is experienced both during and/or after the activity. In addition, it is possible to experience symbolic meaning characterized by the social bonds and the individuals' identity (Erlandsson et al., 2011). Despite the similar elements, the definitions are still very broad and ambiguous, making it challenging to apply them in practice. During the history of Occupational Therapy several attempts were made to divide meaningful activities into different categories.

2.2.1. Conceptualized categories

Initially, Meyer (1922/1977) categorized occupation into the 'big four': Work, Play, Rest, and Sleep. This evolved into self-care, leisure, and work/productivity/education (Creek, 2005). Another example of a subdivision is necessary time, contracted time, committed time, and free time (Ås, 1978). Criticism suggests that these subdivisions need to be more specific.
The conceptualized categories represent occupational forms (Widmark & Fristedt, 2018). The form consists of pre-existing, objective structures that exist independently and outside the individual (Nelson 1988).

Meaningful activities entail various experiences for an individual, often not fitting into a single category. Additionally, the categories are occupational forms that do not capture the relationship between occupation and well-being as they do not reflect the individual's experience (Jonsson, 2008; Harvey & Pentland, 2003; Nelson, 1988). To counter this criticism, the conceptualized categories of occupation evolved into experience-based categories (Jonsson, 2008).

2.2.2. Experience-based categories

Johnson (2008) created seven experience-based categories based on the occupational narratives of retired Swedish workers. The researcher looked for patterns around activities that add significant value to the individual's well-being and those that have no significant effects on well-being. It also distinguished between 'killing time' activities and 'engaging' activities.

This was expressed in the following seven experience-based categories: engaging occupation, basic occupation, social occupation, relaxing occupation, regular occupation, and irregular occupation. The occupational form of the activity is of little importance here.
The researchers ultimately concluded the following: "*Philosophical reasoning and empirically based research could start a fruitful dialogue, expanding knowledge on how occupation and meaning relate to well-being and development. If the emerging science of occupation is to be established, this is most certainly a question of high priority"* (Johnson, 2008, p. 7).

2.2.3. Lack of consensus

Various theories have been developed on meaningful activities. Several activities and target groups have already been investigated using a qualitative method (Cruyt, 2023). However, there still needs to be consensus on the definition or experience-based categorization of meaning before its relationship with well-being and development, as suggested by Johnson (2008), can be explored (Deckert et al., 2018; Strick et al., 2021; Cruyt, 2023).

In the doctoral study by Cruyt (2023), an attempt is made to objectify meaning so that a universal definition can be achieved. To accomplish this, the attributes of meaning were first determined (Cruyt et al., submitted for publication a). The study using grounded theory as a method resulted in three core categories, namely: (1) The environment should be experienced as a suitable, trusted, and safe lever to perform activities (Trust); (2) the person has the ability to develop and express personal skills and qualities (Skills); and (3) The person perceives a symbiotic unity between the activity and the environment as a catalyst to undertake the activity (Challenge). These attributes promote and encourage the experience of meaning while performing an activity (Cruyt et al., submitted for publication a; 2023, p. 253).

Although meaningful activity is a measurable variable for brain tests, the term 'meaning' per se has never been pertinently investigated (Cruyt, 2023). Within the doctoral study, an EEG study was first used to search for meaning in the brain, with no significant result (Cruyt et al., submitted for publication b). This was followed by an fNIRS study in which brain activity from the prefrontal cortex was measured when performing a meaningful activity and an activity that was not perceived as meaningful. The researcher and participant selected the meaningful

activities considering a high presence of the three attributes of meaning. Performing a meaningful activity eventually resulted in a higher correlated network in the prefrontal cortex than performing a non-significant activity. This study is a stepstone for objectifying the meaning in meaningful activities and reaching a consensus about the overarching definition (Cruyt et al., submitted for publication c).

2.3. Scope study

The doctoral study by Cruyt (2023) laid the foundation for objectively defining meaning within meaningful activities. Previous literature reflects the need for uniform experience-based categories to support the definition of occupation (Johnson, 2008).
The three attributes of meaning provide an objective basis to form three axes that quantitatively measure perceived meaning in an activity. This is essential since the effect of meaning is only experienced if the individual has a concrete understanding of their personal meaning-making (Kreiss & Schnell, 2022; Steger & Kashdan, 2013). Before this is possible, an overarching theory needs to be developed that provides consensus between occupational therapists and occupational scientists (Deckert et al., 2018; Strick et al., 2021; Cruyt et al., 2023). The attributes of meaning form a stepping stone to reach this goal (Cruyt et al., 2023).

In the academic year 2022-2023, occupational therapy students of the Master of Occupational Therapy already wrote a paper called 'Creating a structural model to objectively define meaningful activities in daily living in persons with chronic physical conditions'. The researchers drafted a questionnaire concerning the attributes of meaning and applied the Ecological Momentary Assessment method. The findings of this paper will be considered in the pilot study (student assignment master program OT, 2023).

It is necessary to test the attributes of meaning, according to Cruyt (submitted for publication a), in a larger, diverse target group. This can be done by conducting a citizen science project. To ensure that such a study runs smoothly, a pilot study is performed first. This pilot study uses the following research question: "How is an individual's activity capital categorized into distinct experience-based categories based on the attributes of meaning?" The three primary objectives of this pilot study are: (1) To identify and test a suitable application for Ecological

Momentary Assessment; (2) To develop and test a questionnaire to capture the attributes, intensity, and timing of meaning; (3) To conduct an initial exploratory attempt to distill experience-based categories.

3. Method

3.1. Study design

The research is conducted using a cross-sectional study design. This design is characterized by the simultaneous collection of data within the population without manipulation by the researcher, all at one specific point in time. This allows potential correlations between exposures and an outcome to be determined (Wang et al., 2020; Setia, 2016). This study examines the presence of meaning in occupation and the individual's skills, the activity's challenge, and the environment's suitability. To ensure the quality of the research, the study is reported following the STROBE guidelines (Cuschieri, 2019).

3.2. Participants

Within this pilot study, a homogeneous group of Belgian occupational therapy students from Artevelde Hogeschool (Ghent), KU Leuven (Leuven), and UHasselt (Hasselt) was assembled using convenience sampling. The students constituted an accessible group with a varied activity capital. Working students from the program were excluded to maintain homogeneity within the group. One week before the main data collection started, presentations on the scope of the study and information on the data collection process were held for the three years of the bachelor's program and the two years of the master's program (see Appendix 1). Students registered for participation by sharing their email addresses via a Google Form. This email address was used to register participants in the data collection application (SEMA3). Interested students became official participants upon registering with their assigned participant ID in this application.

3.3. Data collection

During participant recruitment, the first phase of data collection took place. Demographic data, namely gender and age, were also surveyed in the Google Form.

In the second phase, the main data collection occurred. For eight days, the researcher collected a variety of snapshots of random daily life activities from the participants using the Ecological Momentary Assessment (EMA). EMA is applied to investigate phenomena, using

repeating questionnaires about experiences concerning real-time activities (Shifmann et al., 2008). The data was collected directly during the performed activity in the natural setting of the participants.

Within the master's in occupational therapy science, students (schoolyear 2022-2023) already produced a paper in which questions regarding the attributes of meaning were formatted and tested in an Ecological Momentary Assessment (student assignment master program OT, 2023). The phrasing of the questions was not consistent between the several researchers during the data collection, so the understanding of the questions and the answers of several participants varied greatly. Therefore, within this pilot study, an application for EMA was tested so that the question was the same for each participant.

3.3.1. Ecological Momentary Assessment Application

In consultation with two other researchers, an appropriate application was sought that was going to make the research possible. The requirements were that notifications could be set randomly, and the application was free to access. There was a unanimous agreement to administer the questionnaire using SEMA3 because it was the only application to offer free admission (Melbourne eResearch Group, 2024). The researcher entered participants into the application system using the provided email addresses gained during the participant recruitment. The software assigned each participant a ParticipantID and automatically sent an invitation email to them. This email included a step-by-step guide to download the application and sign up.

In advance, a schedule for the snapshots was established (See Appendix 2). Two snapshots were randomly scheduled daily, one in the morning/early afternoon (5.00 AM until 2.00 PM) and one in the afternoon/evening (2.00 PM until 11.00 PM). In the schedule, the researcher allocated a full hour, during which participants would randomly receive a pop-up notification requesting them to complete the questionnaire regarding the activity in which they were engaged at that moment. Once the first pop-up notification appeared, the questionnaire remained open for three hours. After this period, the questionnaire closed to avoid cross-contamination with the subsequent snapshot.

3.3.2. Questionnaire

The attributes of meaning-making in daily activities, as Cruyt et al. (submitted for publication a) suggested, served as variables within the questionnaire to collect data from these snapshots (see Table 1). The already prepared questions and findings from the paper of the students from the master's in occupational science (schoolyear 2022-2023) were critically discussed a used as inspiration (student assignment master program OT, 2023). Together with two experts in the field of meaningful activities questions were drafted. The questions were formulated so that the participants could intuitively give a score on a scale from zero to ten, depending on the degree of presence of the questioned attribute.

The first attribute that leads to a meaningful experience is an individual's skills in relation to the activity performed (Van de Velde; 2015; Cruyt et al., submitted for publication a). It is crucial for the development of meaning to possess a correct self-image so that the activity is adapted to the subjective needs. Before, during, or after the performance of an activity, the image of the person's developmental structures or skills is updated. Daily activities stimulate the individual's self-actualization (Nelson, 1988; Cruyt et al., submitted for publication a). If the skills are not suitable for the activity performed, it will feel complex. As a result, the researchers posed a question regarding the perceived degree of complexity while performing a given activity.

The second core attribute is the trust an individual has in the physical or social environment (Van de Velde; 2015; Cruyt et al., submitted for publication a). This revolves around the trust an individual has in their physical and social environment while performing an activity. The environment should be appropriate and safe. This supports an individual's occupational identity, which in turn is linked to meaning (Hocking, 2000; Ciro & Smith, 2015). To keep the questioning easy to understand, the researchers chose to question the appropriateness of the environment while performing the activity (Cruyt, 2023; Cruyt, submitted for publication a). A score of zero represents an inappropriate environment, and a score of ten represents an environment that adds value to the individual. During the live presentation, it is conveyed that this included the concept of 'safety'.

The third and final attribute is the challenge (a trigger) brought by the unity of the environment and the activity (Van de Velde, 2015; Cruyt et al., submitted for publication a). The trigger promotes an individual's motivation to perform a certain activity. It challenges the person to participate. The researcher constructed a question about the experienced amount of challenge during the performance of the activity. The variability here lies in whether the participant experiences no challenge (score zero) or too much challenge (score ten). The ultimate score for an individual is a five, where the participant experiences just enough challenge.

Table 1: Questions quantitative data

Component relation	Attribute	Question	Score 0	Score 5	Score 10
Person-Activity	Skills	How complex do you find the execution of the activity at this point?	The activity is too easy.	The activity is sufficiently complex.	The activity is too complex.
Person-Environment	Trust	To what extent is the current environment suitable for performing the activity?	The environment is inappropriate	The environment is appropriate	The environment is an added value.
Environment-Activity	Challenge	To what extent does this activity offer you just enough challenge?	The activity offers too little challenge	The activity offers just enough challenge	The activity offers too much challenge

For future research, qualitative data that allows retrospective recreating of certain snapshots is considered (see Table 2). The client is questioned about what activity they perform and in what environment. Within the presentation used in patient recruitment, emphasis is placed on the fact that the environment includes both the physical and social environment.

Table 2: Questions qualitative data

Component	Question
Activity	What are you doing at right now?
Environment	Describe the environment in which you perform the current activity.

In addition to the attributes of meaning, questions regarding intensity and timing were developed. The question of timing was inspired by the 'Value and Meaning in Occupations' (ValMO) model, which relates occupational value (experienced meaning at meso- and

microlevel) to three dimensions: concrete value, self-reward value, and symbolic value (Erlandsson et al., 2011). The concrete value is about the tangible rewards, the outcome of the occupational value. The self-reward value concerns the experience during the performance of the activity. This inspired the first author to develop a question about the timing of the experienced meaning. To the question 'Indicate what is most related to the activity performed', a participant could indicate one of the following response options: (1) Performing the activity is meaningful; (2) The result/goal of the activity is meaningful; (3) Both performing, and the result of the activity are meaningful; (4) The activity is not meaningful.

If it has been stated that the activity is not meaningful, the questionnaire ends. A zero score is automatically assigned to the intensity of the experienced meaning.
However, the others were still questioned regarding the intensity of the perceived meaning with the following question: 'How much meaning does the activity contain for you?'. A score slider was provided from one to ten. Where score one represents 'almost no meaning,' and score ten represents 'a lot of meaning'. The entire questionnaire, including the original questions in Dutch, has been included in the appendices (see appendix 3, 4).

3.4. Data analysis

A descriptive analysis was conducted in the initial phase to characterize the dataset. Examples of within-group and between-group differences were provided based on a short case study. Subsequently, a hierarchical cluster analysis was performed to distill various types of activities from the data. In previous research, researchers already provided six clusters based on attributes of meaning (additional statistical analysis in student assignment master program OT, 2023). In consultation with one of these researchers, it was decided to conduct the analysis for six clusters. The activities performed constituted the categorical variables, while the scores given for questions regarding the challenge, appropriateness of the environment, and skills comprised the continuous variables.

Within the next step, the difference in degree of meaning for each cluster was examined. It was essential to first see if the data was normally distributed ($\alpha = 0.05$). If normally distributed, the one-way ANOVA is performed. Otherwise Kruskal-Wallis analysis (non-parametric) is used.

Here, the degree of meaning was considered the dependent variable, while the different clusters were considered the independent variable. Because of the use of multiple comparisons, a Bonferroni correction was applied, with the significance level set at $\alpha = 0.05$. This allowed an objective determination of which cluster was considered most significant.

The distinction in the timing of experiencing meaning was calculated using the chi-square test ($\alpha = 0.05$). The moment when the participant experienced meaning was considered the dependent variable, while the different clusters were considered the independent variable.

These insights were used to construct dome terms that accurately represented the essence of each cluster. The naming process involved collaboration among the researcher, the supervisors, and a subset of the students who participated. When all the data were put together, the validity of the questions drafted was checked by discussing them with two researchers with expertise in meaningful activities.

4. Results

4.1. Descriptive data

4.1.1. Data collection

There is a total of n= 38 students who participated in the study, of which 93.3% are women (see Figure 1). The average age is 22.77 years.

Due to unforeseen circumstances, the first presentation regarding the scope and process of the research was not delivered live. Instead, a recording was made available for students to watch on their own initiative. Thirty students registered via Google Form, of which 15 ultimately signed up in SEMA3 (Melbourne eResearch Group, 2024). To increase this participant group two weeks later, a live presentation was given to students in the master's program, ultimately recruiting an additional 23 participants.

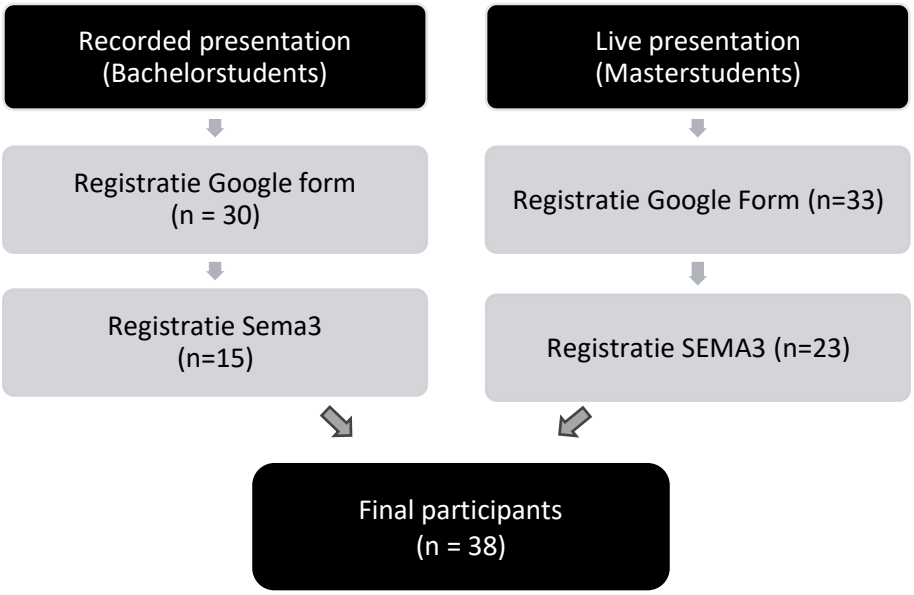


Figure 1: Flowchart participants

For this study, it was essential for the researcher to gather a large activity capital. By using an Ecological Momentary Assessment, 573 snapshots were taken with an average of 16 activities per person, of which 70% (n = 401) were filled out, and 30% (n = 172) contained missing values (see Figure 2). There are two outliers of n= 1 and n= 8 activities per person.

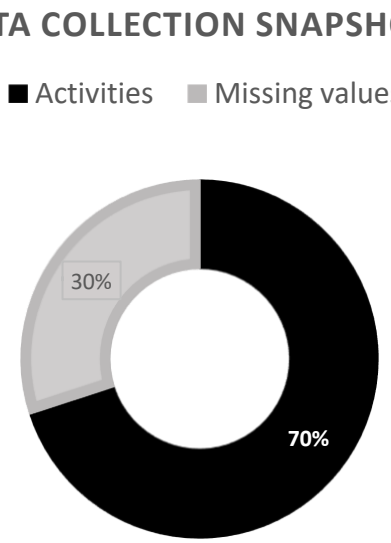


Figure 2: Missing values

4.1.2. Case study

The collected data consisted of both unique activities and recurrent activities. Despite these activities being described the same by different participants, the attributes, intensity, and timing of meaning were different. An example is the activity 'getting up' (see Table 3). Within all the activities, the trust in a suitable environment is high. Participant S799838967 perceives the activity as something too complex. This individual experienced moderate meaning as the result of the occupation. In contrast, participant S87337641 thinks waking up is too easy, and experiences the maximal amount of meaning during and after the occupation.

Table 3: Example activity 'waking up'

Activity	ID	Trust	Skills	Challenge	Intensity meaning	Timing meaning
"Waking up" [Opstaan/wakker worden]	S799838967	10	8	8	5	Result
"Waking up after alarm went off" [Opstaan nadat wekker is afgegaan]	S841665673	9	6	2	0	No meaning
"Waking up" [Opstaan]	S873376411	10	1	1	10	Proces and result
"I am waking up" [Aan het wakker worden]	S431841711	9	0	1	0	No meaning

Table four shows that the attributes, intensity, and moment of meaning may differ among participants in the same activity. However, this difference can also be found within the participants (see Table 4). Participant S091540642 performs the same activity twice, the attribute of trust and the timing of meaning differ. In addition, there is again a difference between the variables with the other participants.

Table 4: Example activity 'taking a lesson'

Activity	ID	Trust	Skils	Challenge	Intensity meaning	Timing meaning
Taking a lesson [Online les]	S091540642	2	9	8	7	Result
Taking a lesson [Les aan eht volgen]	S091540642	8	8	6	8	Process and result
Taking a lesson … [Ik volg de les…]	S119453786	7	5	5	7	Process and result
Taking a lesson [Les aan het volgen]	S187540296	4	4	6	5	Result

Participant S79983897's data contains another example of how meaning can be experienced differently during the performance of an activity. The student describes studying twice. Although the attributes are present to the same extent, there is a difference in intensity and moment of meaning. Between the participants, there is again a big difference in experience, with Participant S624212403 viewing the activity as meaningless during a particular snapshot (see Table 5).

Table 5: Example activity 'Studying'

Activity	ID	Trust	Skills	Challenge	Intensity meaning	Timing meaning
Studying [Studeren…]	S799838967	9	8	9	4	Result
Studying [Studeren…]	S799838967	8	7	7	9	Proces and result
Studying [Studeren]	S624212403	6	7	8	0	No meaning

4.2. Cluster analyses

To develop experience-based categories, a hierarchical cluster analysis was performed using the statistical software program SPSS (IBM, 2024). The variables were formed by the presence of three attributes, each scored on a scale from zero to ten. The qualitative variable describing the type of activity served as the labels. The between-groups linkage method was selected for clustering, in combination with the Squared Euclidean distance (interval). The range for the number of potential clusters was set from three to six. Following the recommendation of another researcher and consistent with prior research, the division into six clusters was maintained (additional statistical analysis in a student assignment for the master program OT, 2023). This division is depicted in a scatterplot, where the axes represent the attributes of meaning (see Figure 3). The different clusters are indicated by colored circles.

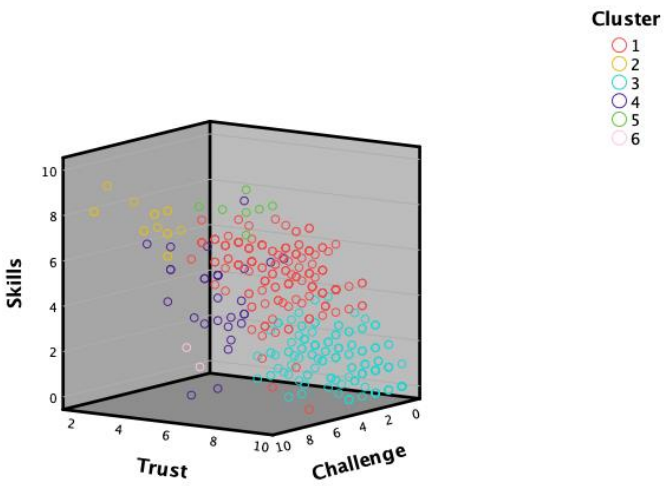


Figure 3: Scatterplot cluster analysis

The first cluster has a collection of 180 activities (valid percentage= 44,9%), making it the largest group. The attributes skill and challenge have a median of Md= 6. Appropriateness of environment (trust) scored higher with a median of Md= 8. The second cluster contains 16 activities (Valid percent= 4%). The median of skills (Md= 7.5) and challenge (Md= 7) are again in the same range. The appropriateness of environment scored lower (Md= 4). The attribute of trust scored is strongly perceived in cluster three (Md= 9). The attributes skills (Md= 1) and challenge (Md= 2) are scored very low. This cluster forms the second largest with a capital of 165 activities (valid percent= 41.1%). Within cluster four, 31 activities are placed (valid percent= 7.7%). The attributes skill, challenge, and trust are scored in the same intensity (Md= 5). Cluster five is the second smallest group with a collection of seven activities (valid percent=

1.7%). Within these clusters, attributes of meaning are strongly perceived. This is reflected in a median score of nine for skills and trust, and a median of ten for challenge. Cluster six is the smallest group, as only two activities (valid percent= 0.5) were included. All three attributes score low, with a 0.5 as the median for skill, a median of two for trust, and a 1.5 for the challenge.

4.2.1. Intensity meaning per cluster

To gain a further understanding of the clusters, the difference in score of meaning experience was calculated. Since the scores were not normally distributed ($p < .001$), the Kruskal-Wallis test was opted for. Cluster six contains the lowest mean score for meaning M= 4 (IQR [0, 8]). Within cluster five, the included activities score the highest, with a mean of M= 7.43 (IQR [4,9]) (see Figure 4).

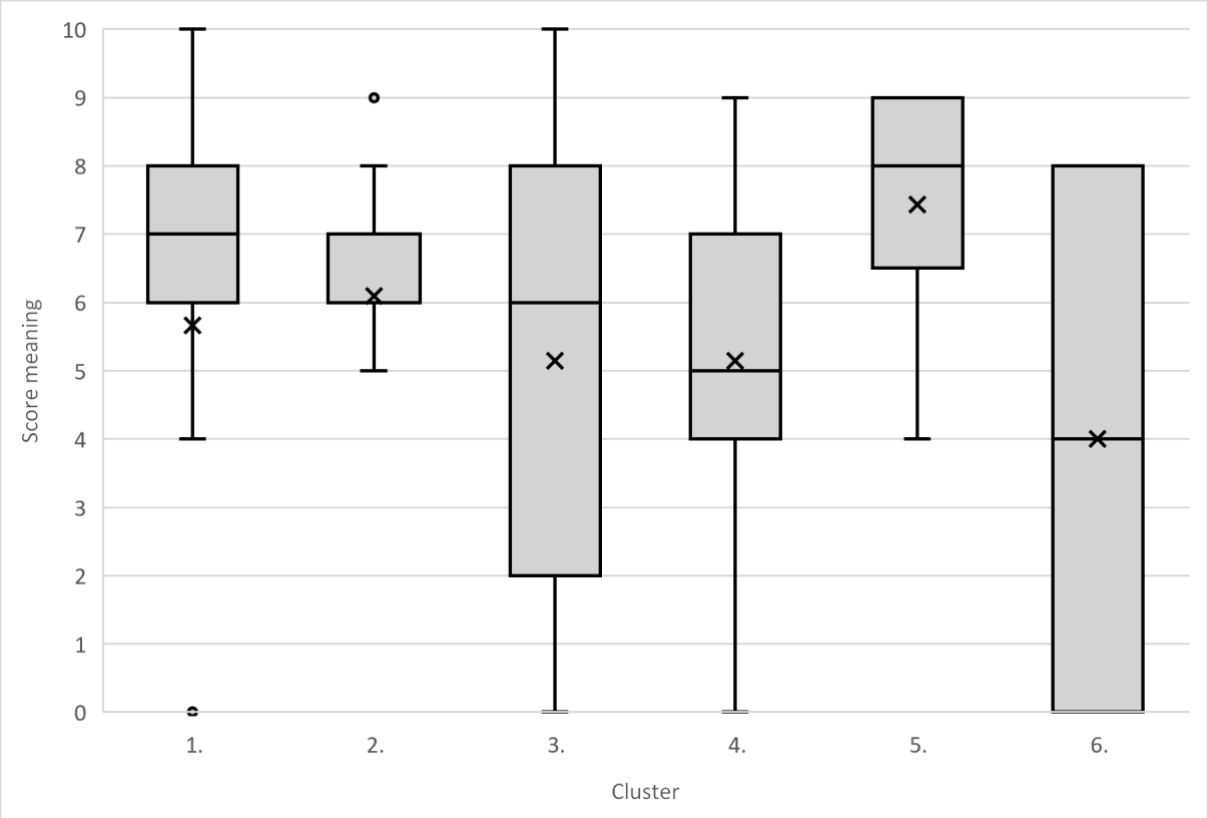


Figure 4: Independent Kruskal-Wallis Test: Intensity Meaning

The difference between the groups was significant according to the Kruskal-Wallis test (df= 5, p= 0.015). In the pairwise comparison of the clusters, the difference between cluster one and cluster four was found to be significant ($p < 0.008$) and between cluster three and cluster one

(p= 0.005). After adjusting for multiple comparisons, the differences between cluster one and cluster four (p(adj)= 0.116) and cluster three and cluster one (p(adj)= 0.068) were no longer found to be significant.

4.2.2. Timing meaning per cluster

A chi-square test was conducted to examine the relationship between the timing of meaning and the different clusters. This indicated a significant relationship (X^2= 52.844, df=15, p <.001). The Cramer's V indicates a weak correlation of 0.210. The adjusted residuals indicate how strongly the observed value deviates from the expected value, adjusted for the sample size (Pierce & Schafer, 1986). The adjusted residual represents the Z-scores of the moments of scores within clusters. If this value is greater than 1.96, there is a significant relationship.

*Table 6: Moment meaning * Cluster Crosstabulation*

		Cluster						
		1	2	3	4	5	6	Total
Process	Count	24	0	49	6	0	0	79
	% within Clusters	13.3%	0.0%	29.7%	19.4%	0.0%	0.0%	19.7%
	Adjusted Residual	**-2.9***	**-2.0***	**4.2***	-.1	-1.3	-.7	
Result	Count	68	10	38	14	3	1	134
	% within Clusters	37.8%	62.5%	23.0%	45.2%	42.9%	50.0%	33.4%
	Adjusted Residual	1.7	**2.5***	**-3.7***	1.4	.5	.5	
Both	Count	74	5	43	7	4	0	133
	% within Clusters	41.1%	31.3%	26.1%	22.6%	57.1%	0.0%	33.2%
	Adjusted Residual	**3.0***	-.2	**-2.5***	-1.3	1.4	-1.0	
None	Count	14	1	35	4	0	1	55
	% within Clusters	7.8%	6.3%	21.2%	12.9%	0.0%	50.0%	13.7%
	Adjusted Residual	**-3.1***	-.9	**3.6***	-.1	-1.1	1.5	
Total	Count	180	16	165	31	7	2	401
	% within Clusters	100.0%	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %

*Significant (p < 0.05)

Across all clusters, meaning was perceived mainly as a result of the activity (33.4%) or throughout the process, as well as an outcome (33.2%) (see Table 6). In cluster one, there is

an overrepresentation of the perception of meaning during and as a result of the activity performed ('both'). Non-meaningful activities, or activities in which meaning is experienced only during the activity, are significantly underrepresented.

In cluster two, there is a significant overrepresentation of the perception of meaning as a result of the activity and a significant underrepresentation of the perception of meaning during the process. In cluster three, meaning is primarily experienced during the activity. Additionally, non-meaningful activities are significantly more represented than expected. The other clusters do not show significant differences in expected patterns.

4.3. Forming experience-based categories

The data is aggregated to derive experience-based categories. It is essential to develop overarching terms that encompasses each cluster. To determine these cluster names, the researcher organized a focus group consisting of a select group of students (n= 25). Participants were presented the clusters containing the associated activities. For each cluster, a representation was provided concerning the degree of presence of the attributes, intensity, and timing of meaning. On average, the researcher divided the participants into groups of four. Within these groups, based on the cluster descriptions, participants were encouraged to propose suitable names.

These were used as inspiration to arrive at definitive umbrella terms, collectively forming experience-based categories: (1) Contextual Enriched activities, (2) Hurdle activities, (3) Recharging activities, (4) Secure activities, (5) Growth-oriented activities, (6) Compulsive activities. This version of the experience-based categories was reviewed by two researchers with expertise in meaningful engagement and approved as temporary categories during the pilot study (see Table 7).

Table 7: Exploration of Possible Experience-based Categories

Experience-based category	Explanation
1. Contextual Enriched activities [Contextueel verrijkte activiteit]	The individual has sufficient skills to perform the activity in a value-added environment. The activity offers just enough challenge. Average intensity meaning: 7

	Timing meaning: 13,3% process; 37,8% result 41,1% both; 7,8% none Examples: Doing groceries, shopping, baking a cake…
2. Hurdle activities [Hindernisactiviteiten]	The individual does not possess all the skills to perform a particular activity. The activity itself takes place in an inappropriate environment. Yet there is a unity between the environment and the activity that challenges the individual to perform. Average intensity meaning: 6 Timing meaning: 13,3% process; 37,8% result; 41,1% both; 7,8% none Examples: Walking home, reading a paper, watching the news…
3. Recharging activities [Oplaadactiviteiten]	The individual has more than sufficient skills to perform the activity in a value-added environment. The activity is not challenging. Average intensity meaning: 6 Timing meaning: 29,7% process; 23% result; 26.1% both; 21,2% none Examples: Watching the television, reading a book, eating, scrolling on my phone…
4. Secure activities [Veilige activiteiten]	The individual has sufficient skills to perform the activity in an appropriate environment. The activity offers just enough challenge. Average intensity meaning: 5 Timing meaning: 19,4% process, 45,2% result, 22,6% both; 12.9% none Examples: To clean, walk the dog, follow a course, listen to music…
5.Growth-oriented activities [Groeigerichte activiteit]	The individual does not have all the skills to perform the activity in a value-added environment. The activity is very challenging. Average intensity meaning: 8 Timing meaning: 0% process; 42,9% result 57.1% both; 0% none Examples: Building a kitchen, first lesson of yoga, studying, working at a groups task…
6. Compulsive activities [Dwangmatige activiteit]	The individual has more than sufficient skills to perform the activity in an inappropriate environment. The activity is not challenging. Average intensity meaning: 4 Timing meaning: 0% process; 50% result, 0% both, 50% none Examples: Making coffee, watching Instagram

5. Discussion

This pilot study explores how an individual's activity capital can be classified into experience-based categories by considering the attributes of meaning. The three primary objectives of this pilot study were: (1) To identify and test a suitable application for Ecological Momentary Assessment; (2) To develop and test a questionnaire to capture the attributes, intensity, and timing of meaning; (3) To conduct an initial exploratory attempt to distill experience-based categories.

A total of 38 students from the bachelor's in occupational therapy (Artevelde Hogeschool) and the master's in occupational therapy (KU Leuven, UHasselt) participated. For eight days, they used SEMA3 (Melbourne eResearch Group, 2024) to fill in a questionnaire at random moments regarding an activity they were currently performing.

5.1. Application Ecological Momentary Assessment

SEMA3 (Melbourne eResearch Group, 2024) is an application designed to conduct an Ecological Momentary Assessment (EMA). Proper preparation, including pre-setting the software, is essential. The application's website provides a user guide and video manuals to assist the researchers in this process. The success of the entire data collection depends on the correct configuration of the software. The manual suggests briefly testing the software in advance to ensure that the settings are as the researcher expects.

A crucial step in the preparation is registering participants in SEMA3 (Melbourne eResearch Group, 2024). The researcher needs their name, first name, and email address. Notably, Hotmail addresses are not permitted. In this pilot study, it was straightforward to request students' school emails. However, in a Citizen Science Project, participants might need to create a new email address, potentially causing reluctance to participate. It is necessary to clearly inform interested participants about this requirement to avoid dropouts.

The questionnaire must also be entered into the software in advance. The application allows the import of multiple questionnaires with various schedules. To avoid additional steps in the future, it is recommended to collect demographic data through the SEMA3 platform rather

than through a Google Form. This will prevent the need to adjust demographic data for individuals who register via Google Form, but do not log in to the SEMA3 application.

Upon successful data registration of the researcher, participants receive a message from SEMA3 (Melbourne eResearch Group, 2024) at the provided email address, which includes a manual and a participant ID. These emails are clearly articulated, though the participant ID can sometimes be overlooked in the volume of information, causing some participants to miss it initially.

A meta-analysis by Wrzus et al. (2022) indicates that EMA studies have an average compliance rate of 79%. In this study, the compliance rate was 70%, indicating room for improvement. Financial incentives for participants can enhance motivation to complete all questionnaires, significantly increasing compliance.

Typically, EMA studies involve four to six testing moments per day over two weeks. In this pilot study, the testing frequency was lower, with two testing moments per day for eight days. As the number of testing moments and days does not affect participant compliance, it is worth considering increasing the number of testing moments to gain more insight into an individual's activity levels (Wrzus et al., 2022). This could include activating testing moments at night, providing more insights into human activity patterns (such as adults working night shifts or youths attending night events).

EMA is particularly effective for repeatedly testing individual behavior within a specific context. As questionnaires address real-time phenomena, recall bias is minimized, and ecological validity is enhanced (Shiffman et al., 2008; Yang et al., 2018; Andrade, 2018).

Currently, the application is used by students averaging 22.7 years of age. Future expansions of the study sample will include older adults, necessitating consideration of their technological skills. According to Mace et al. (2022), this is not an issue, as older adults recognize the potential of digital health. Due to COVID-19, older adults have also more rapidly adopted technology in healthcare and research. The use of smartphone applications has increased

(Mace et al., 2022). Older adults are open to using technology, and when trained, they can successfully utilize it (Preusse et al., 2017).

Upon completion of data collection, SEMA3 (Melbourne eResearch Group, 2024) facilitates exporting the data to an Excel file for analysis. This supports the transition to data analysis, where the Excel document is subsequently imported into SPSS.

The use of an application, in this case, SEMA3, is suitable and recommended due to its low recall bias and high ecological validity. It is essential to provide clear instructions to participants to ensure smooth and correct usage. It is also possible to increase the number of testing moments, including nighttime questionnaires. Additionally, financial incentives, where feasible, are recommended to maintain compliance.

5.2. Questionnaire

Although the questionnaire contains several strong components, adaptation is necessary regarding the Citizen Science Project. The question 'How complex do you find the execution of the activity at this point?' was designed to measure the presence of the attribute 'skills'. However, the complexity of an activity could also refer to the attribute 'challenge' (Cruyt et al., submitted for publication a).

Data indicated that 'skills' and 'challenge' attributes often receive similar scores. In cluster analysis, the medians per cluster of both attributes were never more than one point apart. To refine this question, it is useful to revisit the qualitative study and remake the question based on the descriptions of the attribute 'skills' by Cruyt et al. (submitted for publication a) that initially constructed these attributes. In a previous assignment for the Master's in Occupational Therapy program, the question set included, 'To what extent do you have the skills to perform the activity?' (student assignment master program OT, 2023). This question can be reconsidered and tested in further research.

Another question revolves around the moment at which meaning is experienced. This question is inspired by the dimensions of occupational value, specifically concrete and self-reward value (Erlandsson et al., 2011). The dimensions were initially not designed to

determine a temporal aspect of meaning but do describe value as an 'outcome' and 'the experience of performing.' Additionally, occupational value is described as meaning in the local context (meso and micro levels). Within the results of the pilot study, a significant difference in the timing of meaning experience is noted. Since there is little to no information available in the literature regarding the timing of meaningful experience, it is advisable to retain this question. This provides opportunities to further explore the concept of timing of meaning and relate it to experience-based categories.

The final question examined pertained to the intensity of perceived meaning. Perceived meaning is typically assessed through both objective and subjective indicators. For instance, the Engagement in Meaningful Activities Survey (EMAS) employs a 12-item scale to evaluate the meaningfulness of activities, based on the characterization of engagement in those activities (Goldberg et al., 2002; Cruyt et al., 2023). Scores are aggregated, with higher scores indicating greater perceived meaning. By investigating the intensity of perceived meaning in this study, it becomes possible to correlate the presence of specific attributes with the subjective perception of meaning.

Additionally, the interpretation of the questionnaire's scale from the attributes requires more attention and should be predefined. The attributes are assessed using a scale ranging from zero to ten, with only the scores of zero and ten explicitly labeled. This can result in non-substantive responses, as respondents may interpret intermediate scores subjectively and inconsistently (Bergkvist, 2021). Subsequently, this introduces confirmation bias for researchers, reducing interpretative accuracy. A possible refinement in future studies could be employing a five-point Likert scale, with labeled scores. The different Likert items (scale skill, challenge, and trust) are used together to capture the phenomenon of 'meaning'. The adjustment in the range of the scale would limit interpretive freedom but still allow for necessary nuance. If this is applied, it is essential to be aware of the controversy surrounding the interpretation of the data, where it must be clearly described why it is considered an ordinal or interval variable. (Amedei et al., 2019; Sullivan & Artino, 2013).

The topics examined by the questionnaire are already well-chosen. It is essential to revise the questions regarding 'skills.' The interpretation needs more attention to reduce the likelihood of confirmation bias by the authors afterward.

5.3. Exploration experience-based categories

In this pilot study, the researcher opted to create and name six groups. This resulted in the following experience-based categories: (1) Contextual Enriched Activities, (2) Hurdle Activities, (3) Recharging Activities, (4) Secure Activities, (5) Growth-Oriented Activities, and (6) Compulsive Activities. It is important to note that hierarchical cluster analysis is relatively subjective. Kimes et al. (2017) introduced the 'Significance of Hierarchical Clustering' (SHC), a Monte Carlo-based approach for assessing the significance of hierarchical clusters. It is recommended to use this method in future research.

A closer inspection of these clusters reveals considerable inequality in group sizes (max. n= 180; min. n= 2). The two largest clusters are the 'Contextual Enriched Activities' (n = 180) and the 'Recharging Activities' (n= 165). The smallest clusters are the 'Growth-Oriented Activities' (n= 7) and the 'Compulsive Activities' (n= 2).

Within the Contextual Enriched Activities, the individual has sufficient skills to perform an activity with just enough challenge. This can be related to the experience-based category 'flowing' from Jonsson and Persson (2006), where the 'skills' and 'challenge' are balanced, giving the individual a sense of competence. If these occupations dominate, they can become addictive.

The Recharging Activities cluster includes activities where the individual has high 'skills', and the activity involves a low 'challenge'. Jonsson and Persson (2006) relate this to relaxing or calming experiences (Csikszentmihalyi et al., 1977; Jonsson, 2008). Recharging Activities are often performed when individuals do not want to engage in challenging occupations to maintain occupational balance and prevent burnout (Jonsson, 2008; Jonsson & Persson, 2006).

To achieve a dynamic occupational balance, it is necessary to complement calming experiences and flowing experiences with exacting experiences. These are sources of personal development and can trigger new flow experiences (Jonsson & Persson, 2006). These exacting experiences are recognized within the cluster of growth-oriented activities.

Within the Growth-Oriented Activities, the individual possesses average skills, but the activity presents a high challenge. A predominance of this type of occupation can create feelings of anxiety, stress, and frustration (Csikszentmihalyi et al., 1977; Jonsson, 2008; Jonsson & Persson, 2006). Anxiety can potentially disrupt daily functioning, causing problems in self-care, productivity, and leisure (Gunnarsson et al., 2021). However, activities within this cluster are often perceived as the most meaningful. If anxiety occurs in a supportive environment, it can enhance performance (Helbich, 2018). The environment within the Growth-Oriented Activities cluster is described as beneficial, suggesting that the anxiety may be positively experienced. This cluster can be linked to the exacting experiences of Jonsson & Persson (2006), which promote personal growth. Personal growth is strongly related to the experience of meaning (Roberts & Bannigan, 2018; Kreiss & Schnell, 2022; Carreno et al., 2023). Engaging in meaningful activities can help individuals achieve cultural or personal goals (Ciro & Smith, 2015). Through meaningful activities, an individual's identity can be shaped or transformed (Nelson, 1988; Hocking, 2000; Kreiss & Schnell, 2022). The potential stress, anxiety, and frustration may explain why this cluster is less prevalent despite its positive effects on personal growth.

The cluster of Compulsive Activities is the smallest cluster, with only two activities. These activities lack meaningful attributes, with the environment being inappropriate, the individual unable to express their skills, and no challenge presented by the activity (Van de Velde, 2015; Cruyt et al., submitted for publication a). These activities can be linked to the time-killing activities described by Jonsson (2008), which do not contribute to individual well-being, although they may create a false sense of well-being (Twinley, 2012).

Despite the unequal distribution of clusters, the largest and smallest groupings can be explained by existing literature. The hierarchical clustering was conducted with a limited data size. It is essential to test the distribution of experience-based categories within a larger, more heterogeneous population to potentially validate and generalize the cluster distribution.

5.4. Future research and implementation for practice

It is recommended to validate the experience-based categories within large-scale research. This can be initiated in the planned citizen science project in Flanders. However, the categories can also be applied in other fundamental research to achieve an overarching theory of meaning-making. The experience-based categories will evolve as they are tested within more heterogeneous and larger target groups.

Previously, Cruyt (submitted for publication c) found that the energy metabolism in an individual's prefrontal cortex is greater when engaging in a meaningful activity than when engaging in a non-meaningful activity. Since this research is already based on the attributes of meaningful experience, these experience-based categories of meaningful activities provide an interesting basis to replicate the fNIRS study. This replication would examine whether the intensity of meaning can be related to the degree of energy metabolism in the prefrontal cortex of the person performing the activity.

Research indicates that meaningful activities shape identity and stimulate personal growth. This suggests an interesting avenue to explore whether personas can be formed for each experience-based category (Nelson, 1988; Hocking, 2000; Kreiss & Schnell, 2022; Ciro & Smith, 2015). Hypothetically, individuals who primarily engage in Growth-Oriented Activities may possess different personality traits than those who primarily engage in Recharge Activities.

If the experience-based categories based on attributes, intensity, and timing of perceived meaning are validated in the future, it will be possible to explore potential interrelationships and dynamics between them. A similarity has already been observed between the six experience-based categories and the three dimensions of flow theory (Jonsson & Persson, 2006). These three dimensions have a dynamic relationship with each other. Given this similarity, it can be inferred that a dynamic relationship may also exist within the six experience-based categories.

Generally, the findings contribute to the ongoing discourse on defining and measuring meaningful activities in occupational science and, subsequently, occupational therapy, laying

the groundwork for future large-scale studies. This study underscores the necessity of further research to validate the proposed categories.

6. Conclusion

Within the pilot study, SEMA3 (EMA application) is declared suitable for implementation within the Citizen Science Project if clear instructions are provided for the participants. The questionnaire still needs modifications before it can be applied. The inclusion of the three topics: 'attributes,' 'intensity', and 'timing' of meaning, form a solid base for the questionnaire. However, refinement of the question related to the attribute 'skills' is recommended to ensure clear differentiation from the attribute 'challenge'. To reduce confirmation bias, it is advised to define the interpretation of the questionnaire more precisely in advance. The recommendation is to use a five-point Likert scale, with all scoring options labeled. The present study has distilled the following experience-based categories: (1) Contextual enriched activities, (2) Hurdle activities, (3) Recharge activities, (4) Secure activities, (5) Growth-oriented activities, and (6) Compulsive activities. Validation of these categories within large-scale studies is essential.

7. References

7.1. Journal article

American Occupational Therapy Association. (2020). Occupational therapy practice framework: Domain and process (4th ed.). *American Journal of Occupational Therapy, 74* (Suppl. 2), 7412410010. https://doi.org/10.5014/ajot.2020.74S2001

Amidei J., Piwek P., Willis A. (2019). The use of rating and Likert scales in Natural Language Generation human evaluation tasks: A review and some recommendations. *Proceedings of the 12th International Conference on Naturale Language Generation,* 397-402. https://doi.org/10.18653/v1/W19-8648

Andrade C. (2018). Internal, External, and Ecological Validity in Research Design, Conduct, and Evaluation. Indian journal of psychological medicine, 40(5), 498–499. https://doi.org/10.4103/IJPSYM.IJPSYM_334_18

Armstrong R. A. (2014). When to use the Bonferroni correction. *Ophthalmic & physiological optics : the journal of the British College of Ophthalmic Opticians (Optometrists)*, *34*(5), 502–508. https://doi.org/10.1111/opo.12131

Ås, D. (1978). Studies of Time-Use: Problems and Prospects. Acta Sociologica, 21(2), 125–141. https://www.jstor.org/stable/4194228

Bauerschmidt, B., & Nelson, D. L. (2011). The terms occupation and activity over the history of official occupational therapy publications. *The American journal of occupational therapy : official publication of the American Occupational Therapy Association*, *65*(3), 338–345. https://doi.org/10.5014/ajot.2011.000869

Bergkvist, L. (2021). Negative effects of unlabeled response scales. International Journal of Market Research, 63(6), 772-785. https://doi.org/10.1177/1470785320981815

Carreno, D. F., Eisenbeck, N., Uclés-Juárez, R., & García-Montes, J. M. (2023). Reappraising personal values in cancer: Meaning-in-life adaptation, meaningfulness, and quality of life. *Psycho-oncology*, *32*(12), 1905–1917. https://doi.org/10.1002/pon.6244

Ciro, C., Smith, P. (2015). Improving Personal Characterization of Meaningful Activity in Adults with chronic conditions living in a Low-Income Housing Community. *Int. J. Environ. Res. Public Health* 12(9), 11379-95. https://doi.org/10.3390/ijerph120911379

Cook, G., Thompson, J., & Reed, J. (2015). Re-conceptualising the status of residents in a care home: older people wanting to 'live with care.' *Ageing and Society*, 35(8), 1587–1613. https://doi.org/10.1017/S0144686X14000397

Creek J. Occupational Therapy Defined as a Complex Intervention: A 5-Year Review. British Journal of Occupational Therapy. 2009;72(3):105-115. https://doi.org/10.1177/030802260907200304

Cruyt E, Criel Y, De Vriendt P, Vlerick P, Calder P, De Pauw R, Oostra K, De Letter M, Van de Velde D. *Electric brain potentials evoked by pictures of meaningful activities: a search for "meaning".* [Manuscript submitted for publication b]. Department of Rehabilitation Sciences, University Gent.

Cruyt E, De Vriendt P, De Letter M, Vlerick P, Calders P, Oostra K, De Pauw R, Van de Velde D. *Objectifying meaning in activities by measuring prefrontal cortical oxygenation: an explorative fNIRS study.* [Manuscript submitted for publication c]. Department of Rehabilitation Sciences, University Gent.

Cruyt E, Ryckebosch M, De Vriendt P, Jarrey M, Moreels T, Braeckman J, Eijkelkamp A, Wille C, De Letter M, Vlerick P, Calders P, De Pauw R, Oostra K, Van de Velde D. *Attributes of meaning in activity as experienced by people with chronic conditions: a grounded theory analysis on the transaction between the activity, the person, and the environment.* [Manuscript submitted for publication a]. Department of Rehabilitation Sciences, University Gent.

Cruyt, E., De Vriendt, P., De Letter, M., Vlerick, P., Calders, P., De Pauw, R., Oostra, K., Rodríguez-Bailón, M., Szmalec, A., Merchán-Baeza, J. A., Fernández-Solano, A. J., Vidaña-Moya, L., & Van De Velde, D. (2021). Meaningful activities during COVID-19 lockdown and association with mental health in Belgian adults. *BMC Public Health*, *21*(1), 622. https://doi.org/10.1186/s12889-021-10673-4

Cuschieri, S. (2019). The STROBE guidelines. *Saudi Journal of Anaesthesia*, 13(5), S31–S34. https://doi.org/10.4103/SJA.SJA_543_18

Deckert, A. L., Gheihman, G., Nissim, R., Chung, C., Schimmer, A. D., Zimmermann, C. & Rodin, G. (2018). The importance of meaningful activity in people living with acute myeloid leukemia. *Leukemia Research*, 67, 86–91. https://doi.org/10.1016/j.leukres.2018.02.009

Dhas, B. N., & Wagman, P. (2020). Occupational balance from a clinical perspective. *Scandinavian Journal of Occupational Therapy*, *29*(5), 373–379. https://doi.org/10.1080/11038128.2020.1865450

Eakman, A. M., & Eklund, M. (2012). The relative impact of personality traits, meaningful occupation and occupational value on meaning in life and life satisfaction. *Journal of Occupational Science*, 19(2), 165–177. https://doi.org/10.1080/14427591.2012.671762

Erlandsson, L. K., Eklund, M., & Persson, D. (2011). Occupational value and relationships to meaning and health: elaborations of the ValMO-model. *Scandinavian journal of occupational therapy*, *18*(1), 72–80. https://doi.org/10.3109/11038121003671619

Glass, T. A., De Leon, C. M., Marottoli, R. A., & Berkman, L. F. (1999). Population based study of social and productive activities as predictors of survival among elderly Americans. *BMJ. British Medical Journal*, *319*(7208), 478–483. https://doi.org/10.1136/bmj.319.7208.478

Goldberg, B., Brintnell, E. S., & Goldberg, J. (2002). The relationship between engagement in meaningful activities and quality of life in persons disabled by mental illness. *Occupational Therapy in Mental Health,* 18(2), 17–44. https://doi.org/10.1300/J004v18n02_03

Gunnarsson, A. B., Hedberg, A. K., Håkansson, C., Hedin, K., & Wagman, P. (2023). Occupational performance problems in people with depression and anxiety. Scandinavian journal of occupational therapy, 30(2), 148–158. https://doi.org/10.1080/11038128.2021.1882562

Gustafsson, L., Molineux, M., & Bennett, S. (2014). Contemporary occupational therapy practice: The challenges of being evidence-based and philosophically congruent. *Australian Occupational Therapy Journal*, 61(2), 121–123. https://doi.org/10.1111/1440-1630.12110

Helbich, M. (2018). Mental Health and Environmental Exposures: An Editorial. *International Journal of Environmental Research and Public Health*, *15*(10), 2207. https://doi.org/10.3390/ijerph15102207

Hocking, C. (2000). Occupational science: A stocktake of accumulated insights. *Journal of Occupational Science*, *7*(2), 58–67. https://doi.org/10.1080/14427591.2000.9686466

Jonsson, H. (2008). A new direction in the conceptualization and categorization of occupation. *Journal of Occupational Science*, *15*(1), 3–8. https://doi.org/10.1080/14427591.2008.9686601

Jonsson, H., & Persson, D. (2006). Towards an Experiential Model of Occupational Balance: An Alternative Perspective on Flow Theory Analysis. Journal of Occupational Science, 13(1), 62–73. https://doi.org/10.1080/14427591.2006.9686571

Joosten, A. (2015). Contemporary occupational therapy: Our occupational therapy models are essential to occupation-centred practice. *Australian Occupational Therapy Journal*, 62(3), 219–222. https://doi.org/10.1111/1440-1630.12186

Kielhofner, G. (1982). A Heritage of Activity: Development of theory. *the American Journal of Occupational Therapy,* 36(11), 723–730. https://doi.org/10.5014/ajot.36.11.723

Kimes, P. K., Liu, Y., Hayes, D. N., & Marron, J. S. (2017). Statistical significance for hierarchical clustering. Biometrics, 73(3), 811–821. https://doi.org/10.1111/biom.12647

Kreiss, C., & Schnell, T. (2022). Have a good day! An experience-sampling study of daily meaningful and pleasant activities. *Frontiers in psychology*, *13*, 977687. https://doi.org/10.3389/fpsyg.2022.977687

Loh, S. Y., Sapihis, M., Danaee, M. & Chua, Y. P. (2020). *The role of occupational*- participation, meaningful-activity and quality-of-life of colorectal cancer survivors: *findings from path-modelling*. *Disability and Rehabilitation*, 43(19), 2729–2738. https://doi.org/10.1080/09638288.2020.1715492

Lyu, D., Gai, X., & Zhong, Y. (2023). Purpose orientation and its protective effect on Self-Esteem among Chinese depressive patients: a comparative study. *Psychology Research and Behavior Management*, 22(16) 5197–5207. https://doi.org/10.2147/prbm.s435433

Mace, R. A., Mattos, M. K., & Vranceanu, A. (2022). Older adults can use technology: why healthcare professionals must overcome ageism in digital health. Translational Behavioral Medicine, 12(12), 1102–1105. https://doi.org/10.1093/tbm/ibac070

Machteld Huber (2013). Naar een nieuw begrip van gezondheid: Pijlers voor Positieve Gezondheid. Tijdschrift voor gezondheidswetenschappen, 91(3), 133–134. https://doi.org/10.1007/s12508-013-0046-z

Meyer A. (1977). The philosophy of occupation therapy. Reprinted from the Archives of Occupational Therapy, Volume 1, pp. 1–10, 1922. *The American Journal of Occupational Therapy: Official publication of the American Occupational Therapy Association*, 31(10), 639–642.

Nelson D. L. (1988). Occupation: form and performance. *The American Journal of Occupational Therapy: Official publication of the American Occupational Therapy Association*, *42*(10), 633–641. https://doi.org/10.5014/ajot.42.10.633

Pierce, D. (2001). Untangling Occupation and Activity. *The American Journal of Occupational Therapy*, 55(2), 138–146. https://doi.org/10.5014/ajot.55.2.138

Pierce, D. A., & Schafer, D. W. (1986). Residuals in Generalized Linear Models. Journal of the American Statistical Association, 81(396), 977–986. https://doi.org/10.1080/01621459.1986.10478361

Pizzi, M. A., & Richards, L. G. (2017). Promoting Health, Well-Being, and Quality of Life in Occupational Therapy: A Commitment to a Paradigm Shift for the Next 100 Years. *The American journal of occupational therapy : official publication of the American Occupational Therapy Association*, *71*(4), 7104170010p1–7104170010p5. https://doi.org/10.5014/ajot.2017.028456

Preusse, K. C., Mitzner, T. L., Fausset, C. B., & Rogers, W. A. (2017). Older Adults' Acceptance of Activity Trackers. *Journal of applied gerontology : the official journal of the Southern Gerontological Society*, *36*(2), 127–155. https://doi.org/10.1177/0733464815624151

Reilly M. (1962). Occupational therapy can be one of the great ideas of 20th century medicine. The American journal of occupational therapy : official publication of the American Occupational Therapy Association, 16, 1–9.

Roberts, A. E. K., & Bannigan, K. (2018). Dimensions of personal meaning from engagement in occupations: a metasynthesis. Canadian Journal of Occupational Therapy, 85(5), 386-396. https://doi.org/10.1177/0008417418820358

Royeen, C. B. (2002). Occupation reconsidered. *Occupational Therapy International*, 9(2), 111–120. https://doi.org/10.1002/oti.159

Setia M.S. (2016). Methodology Series Module 3: Cross-sectional Studies. *Indian J Dermatol*, 61(3), 261-4. https://doi.org/10.4103/0019-5154.182410

Shiffman, S., Stone, A. A., & Hufford, M. R. (2008). Ecological momentary assessment. *Annual review of clinical psychology*, *4*, 1–32. https://doi.org/10.1146/annurev.clinpsy.3.022806.091415

Steger, M. F., & Kashdan, T. B. (2013). The unbearable lightness of meaning: Well-being and unstable meaning in life. *The Journal of Positive Psychology, 8*(2), 103–115. https://doi.org/10.1080/17439760.2013.771208

Strick, K., Abbott, R., Coon, J. T., & Garside, R. (2021). Meta-ethnography of the purpose of meaningful occupation for people living with dementia. *International Journal of Older People Nursing*, 16, e12391. https://doi.org/10.1111/opn.12391

Sullivan, G. M., & Artino, A. R. (2013). Analyzing and interpreting data from Likert-Type scales. Journal of Graduate Medical Education, 5(4), 541–542. https://doi.org/10.4300/jgme-5-4-18

Twinley, R. (2012). The dark side of occupation: A concept for consideration. *Australian Occupational Therapy Journal*, *60*(4), 301–303. https://doi.org/10.1111/1440-1630.12026

Wagman, P., Håkansson, C., & Björklund, A. (2011). Occupational balance as used in occupational therapy: A concept analysis. *Scandinavian Journal of Occupational Therapy*, *19*(4), 322–327. https://doi.org/10.3109/11038128.2011.596219

Wang, X., & Cheng, Z. (2020). Cross-Sectional Studies: Strengths, Weaknesses, and Recommendations. *Chest*, *158*(1S), S65–S71. https://doi.org/10.1016/j.chest.2020.03.012

Widmark, E., & Fristedt, S. (2018). Occupation according to adolescents: Daily occupations categorized based on adolescents' experiences. *Journal of Occupational Science*, 26(4), 470–483. https://doi.org/10.1080/14427591.2018.1546609

Wilcock, A. (1998). Reflections on doing, being, and becoming. *Canadian Journal of Occupational Therapy*, *65*(5), 248–256. https://doi.org/10.1177/000841749806500501

Wrzus, C., & Neubauer, A. B. (2023). Ecological Momentary Assessment: A Meta-Analysis on Designs, Samples, and Compliance Across Research Fields. Assessment, 30(3), 825-846. https://doi.org/10.1177/10731911211067538

Yang, Y. S., Ryu, G. W., Han, I., Oh, S., & Choi, M. (2018). Ecological Momentary Assessment using Smartphone-Based mobile application for affect and stress assessment. Healthcare Informatics Research, 24(4), 381. https://doi.org/10.4258/hir.2018.24.4.381

Yerxa E. J. (1990). An introduction to occupational science, a foundation for occupational therapy in the 21st century. *Occupational therapy in health care*, *6*(4), 1–17. https://doi.org/10.1080/J003v06n04_04

7.2. Book(chapter)

Harvey, A. S., & Pentland, W. (2003). "What do people do?" In C. Christiansen & E. Townsend (Eds.), *Introduction to occupation: The art and science of living* (pp. 63-90). Upper Saddle River, NJ: Prentice Hall.

Van de Velde, D. (2015). Occupatie als onderdeel van het vakjargon van de ergotherapeut; De ontwikkeling van het Comprehensief Model van Occupatie. Jaarboek ergotherapie, Red; Van Handenhove, Wilfried. Acco Leuven/Den Haag

Kielhofner, G. (2009). *Conceptual foundations of occupational therapy practice* (4th ed). F.A. Davis

7.3. Unpublished dissertation

Cruyt. E. (2023). Unraveling the concept of meaningful activities in chronic conditions: from subjective experience to objective observations in the brain: a multi-method approach. [Unpublished doctoral dissertation]. Ghent University. Faculty of Medicina and Health Sciences, Ghent, Belgium.

7.4. Software and applications

Melbourne eResearch Group, (2020). SEMA3 (version 1.4.1) [Mobile application software]. App store. https://sema3.com/

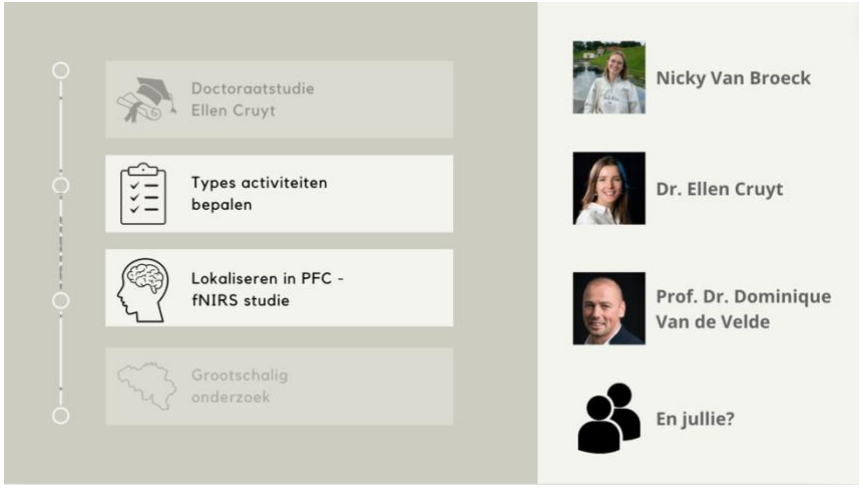
IBM Corp (2023). IBM SPSS *Statistics for Macintosh* (Version 29.0.0.0) [Computer Software] https://www.ibm.com/spss

7.5. Report

International Health Conference, (New York, June-July 1946). (1948). Summary report on proceedings, minutes and final acts of the International Health Conference held in New York from 19 June to 22 July 1946. United Nations, World Health Organization, Interim Commission. https://iris.who.int/handle/10665/85573

8. Appendices

8.1. Appendix 1: Presentation participant recruitment



BeReal.

now

⚠ Time to BeReal. ⚠

2 min left to capture a BeReal and see what your friends are up to!

- Ecological Momentary Assessment
- Momentopname
- Geanonimiseerde vragenlijst: omgeving, activiteit, persoon
- Twee meldingen per dag tijdens lesvrije week

SEMA^3

now

Meaningful Activities

Momentopname activiteit

1

Gegevens invullen
! Schoolmail !

2

SEMA^3

App installeren

3

ID nummer ingeven

SEMA^3

1. vragenlijst invullen
2. App te installeren

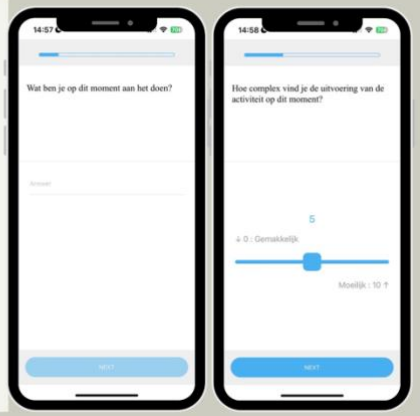
Vragenlijst - Activiteit

Wat ben je op dit moment aan het doen?

- Omschrijving activiteit
- *"Presenteren voor mijn thesis"*

Hoe complex vind je de uitvoering van de activiteit op dit moment?

- Score 0 (te gemakkelijk) - 10 (te moeilijk)



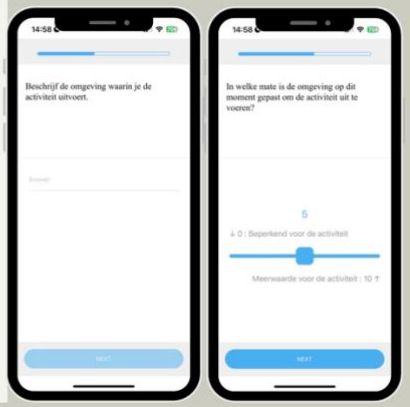
Vragenlijst - Omgeving

Beschrijf de omgeving waarin je de activiteit uitvoert.

- Fysieke en sociale omgeving
- *"In een aula/klaslokaal met meerdere studenten"*

In welke mate is de omgeving op dit moment gepast om de activiteit uit te voeren?

- Score 0 (nee, beperkend voor de activiteit) - 10 (ja, meerwaarde voor de activiteit)



Vragenlijst - Persoon

In welke mate biedt deze activiteit jou nét voldoende uitdaging?

- Score 0 (te weinig uitdagend) - 10 (te veel uitdagend)
- Score 5 = nét voldoende uitdaging

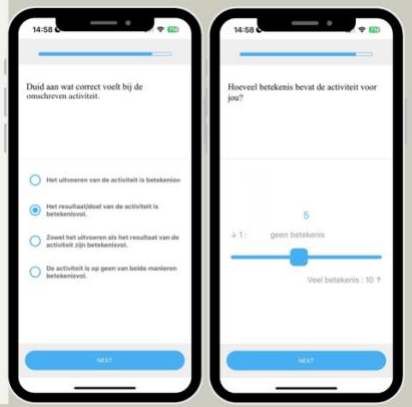
Vragenlijst - Betekenis

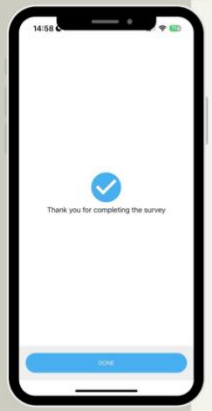
Duid aan wat correct voelt bij de omschreven activiteit.

- Betekenis tijdens het uitvoeren.
- Het resultaat is betekenisvol.
- Beiden
- Geen van beiden

Hoeveel betekenis bevat de activiteit voor jou?

- Score 1 (Bijna geen betekenis) - 10 (Veel betekenis)





Wat daarna?

- Verdeling maken van types activiteiten
- Tiental personen uitnodigen voor fNIRS-studie

To do:

Vanaf jullie mail krijgen van mij en SEMA3:

- Inloggen op SEMA3 app met participant ID uit mail
- Enquete invullen wanneer er een melding is

Twijfel niet om mij te contacteren als er vragen zijn!

nicky.vanbroeck@student.kuleuven.be

Dankjewel om te luisteren!
Zijn er nog vragen?

Bron voorgaande studie

Cruyt, E. (2023). Unraveling the concept of meaningful activities in chronic conditions : from subjective experience to objective observations in the brain : a multi-method approach. Ghent University. Faculty of Medicine and Health Sciences, Ghent, Belgium.

8.2. Appendix 2: Schedule SEMA3

Settings survey window:

- Length (Mins): 60
- Expiry (Mins): 180

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Trigger first questionnaire	11:30 AM – 12:30 PM	06:15 AM – 07:15 AM	10:30 AM – 11:30 AM	07:30 AM – 08:30 AM	05:00 AM – 06:00 AM	09:00 AM – 10:00 AM	08:00 AM – 09:00 AM	12:00 AM – 01:00 PM
Trigger second questionnaire	09:30 PM – 10:30 PM	04:00 PM – 05:00 PM	07:15 PM – 08:15 PM	02:15 PM – 03:15 PM	01:30 PM – 02:30 PM	08:00 PM – 09:00 PM	05:00 PM – 06:00 PM	06:00 PM – 07:00 PM

8.3. Appendix 3: Questionnaire Dutch

1. Wat ben je op dit moment aan het doen?

(Open antwoordmogelijkheid)

2. Hoe complex vind je de uitvoering van de activiteit op dit moment?

0 (Te gemakkelijk)

5 (Net voldoende)

10 (Te moeilijk)

3. Beschrijf de omgeving waarin je de activiteit uitvoert.

(Open antwoordmogelijkheid)

4. In welke mate is de omgeving op dit moment gepast om de activiteit uit te voeren?

0 (Ongepast)

5 (Net voldoende gepast)

10 (Zeer gepast, een meerwaarde)

5. In welke mate biedt deze activiteit jou nét voldoende uitdaging?

0 (Te weinig uitdaging)

5 (Net vodloende uitdaging)

10 (Te veel uitdaging)

6. Duid aan wat correct voelt bij de omschreven activiteit.

A. Uitvoeren van de activiteit is betekenisvol.

B. Het resultaat/doel van de activiteit is betekenisvol.

C. Zowel het uitvoeren als het resultaat van de activiteit is betekenisvol.

D. De activiteit is niet betekenisvol.

7. Hoeveel betekenis bevat de activiteit voor jou?

1 (Zeer weinig betekenis)

10 (Veel betekenis)

8.4. Appendix 4: Questionnaire English

1. What are you currently doing?

(Open answer)

2. How complex do you find the execution of the activity at this point?

0 (Too easy)

5 (Sufficiently complex)

10 (Too complex)

3. Describe the environment in which you perform the activity.

(Open answer)

4. To what extent is the current environment suitable for performing the activity?

0 (Inappropriate)

5 (Appropriate)

10 (Very appropriate, an added value)

5. To what extent does this activity offer you just enough challenge?

0 (Too little challenge)

5 (Just enough challenge)

10 (Too much challenge)

6. Indicate what is most related to the performed activity.

A. Performing the activity is meaningful.

B. The result/goal of the activity is meaningful.

C. Both performing and the outcome of the activity are meaningful.

D. The activity is not meaningful

7. How much meaning does this activity contain for you?

1 (Very little meaning)

10 (A lot of meaning)