

# Activities in dementia care: A comparative assessment of activity types

Dementia  
0(0) 1–19

© The Author(s) 2016

Reprints and permissions:

[sagepub.co.uk/journalsPermissions.nav](http://sagepub.co.uk/journalsPermissions.nav)

DOI: 10.1177/1471301216680890

[dem.sagepub.com](http://dem.sagepub.com)



**Elizabeth Lokon**

Scripps Gerontology Center, Miami University, Oxford, OH, USA

**Philip E Sauer**

Department of Sociology and Gerontology, Scripps Gerontology Center, Miami University, Oxford, OH, USA

**Yue Li**

Discovery Center for Evaluation, Research, and Professional Learning, Miami University, Oxford, OH, USA

## Abstract

This exploratory study compares the impact of five activity types on the well-being of institutionalized people with dementia: the intergenerational art program Opening Minds through Art, art and music therapies, creative activities, non-creative activities, and no activities at all. We validated the Scripps Modified Greater Cincinnati Chapter Well-Being Observational Tool, and used that instrument to systematically observe  $N=67$  people with dementia as they participated in different activity types. People with dementia showed the highest well-being scores during Opening Minds through Art compared to all other activities. No significant well-being differences were found between creative activities led by licensed art/music therapist versus regular activity staff. Furthermore, no significant well-being differences were found between creative and non-creative activities that were both led by regular activity staff. Overall, people with dementia benefit from participating in activities, regardless of the type (creative or non-creative), or who conducts them (licensed therapists or activity staff). However, in order for people with dementia to reach significantly high levels of overall well-being, we recommend that activities are specifically designed for people with dementia and incorporate a 1:1 ratio between people with dementia and well-trained volunteers/staff members.

## Keywords

Alzheimer's disease, dementia activities, comparative assessment, well-being, creative self-expression

---

### Corresponding author:

Elizabeth Lokon, Scripps Gerontology Center, 396 Upham Hall, Miami University, Oxford, OH 45056, USA.

Email: [lokonej@miamioh.edu](mailto:lokonej@miamioh.edu)

## Introduction

As social beings, we have both the capacity to create and the desire to express ourselves. Various art forms are particularly well-positioned to offer people such creative and interactive benefits. The United Nations Universal Declaration of Human Rights (1948) reinforces the universal right of creative participation, stating in Article 27: “Everyone has the right freely to participate in the cultural life of the community, to enjoy the arts and to share in scientific advancement and its benefits.” This universal right applies throughout the life course, regardless of cognitive status. People with dementia (PWD) are also entitled to participate in and enjoy the arts. In fact, when logical thinking and verbal expressions are impaired by dementia, art may be the only means left for them to express themselves and to communicate with others around them.

There is ample research evidence that engagement in the arts contributes to better health and improved psychosocial well-being of all people (e.g., Beard, 2012; Cohen, 2006; Kent & Li, 2013). Given the hegemony of biomedical approaches to memory loss, there are inadequate creative opportunities available to people living in long-term care facilities, especially if they develop dementia (Buettner & Fitzsimmons, 2003; Chung, 2004; Ice, 2002). Perhaps because creative opportunities for PWD are relatively uncommon, research evidence documenting the impact of arts engagement on the well-being of PWD is also limited. Moreover, the rigid biomedical methods and language used to evaluate creative-expressive art activities are oftentimes inappropriate and detract from the true value and meaning of the “in-the-moment” benefits PWD experience. The purpose of this paper is to document the comparative impact of several types of creative and non-creative activities on the well-being of PWD.

As people live longer, the number of people living with dementia is expected to increase, because age is one of the main risk factors for developing dementia. Dementia is a global impairment of memory and judgment caused by a variety of diseases, including Alzheimer’s disease, that interfere with the functioning of the brain. Alzheimer’s Disease International (2015), the world-wide federation of Alzheimer’s Associations, estimates that 46.8 million people around the world were living with dementia in 2015. This number is expected to almost triple over the next three decades. The majority of new cases will be contributed by low and middle income countries (LMICs) during this time span. By 2050, it is estimated that there will be roughly 131.5 million PWD, of whom 32% (ca. 42 million) will be living in high income countries, and 68% (ca. 89 million) will be living in LMICs.

Psychologist Thomas Kitwood explains how quality of life typically declines for PWD. As dementia progresses, people’s perceived capacity to engage with the world around them is threatened. People with moderate to advanced dementia may lack the ability to communicate through logical, verbal channels, yet their need to communicate and express themselves remains. They become physically and psychologically dependent on others. Kitwood (1998) describes the process of becoming dependent on others as follows:

A person who has dementia is, *ipso facto*, relatively powerless, and may have to endure many kinds of mental anguish: confusion, frustration, grief, fear, anger, and despair. Moreover, the ability to understand what is happening, both within the psyche and in the outside world, may be impaired, and with that the capacity to enter fully and realistically into decisions affecting the course of life. Dementia, then, makes a person exceptionally dependent on others: not only in the physical sense, but in a psychological sense as well. (p. 23)

This dependency is all too often intensified by the lack of understanding that institutional or even family caregivers have about the personhood that remains within the person who has

developed dementia. Kitwood (1997) defines personhood as “a standing or status that is bestowed upon one human being, by others, in the context of relationship and social being. It implies recognition, respect, and trust” (p. 8). And that “the primary task of dementia care... is to maintain personhood in the face of failing of mental powers” (p. 84). When personhood is not maintained, over time, the confidence and capacity for self-expression of the person with dementia can be undermined not only by the disease itself, but also by the way they are re-defined as mentally and physically incompetent by the very people caring for them. The end result is often times characterized as “excess disability: The discrepancy that exists when a person’s functional incapacity is greater than that warranted by the actual impairment” (Chung, 2004, p. 23). Excess disability contributes to reduction of the quality of life and well-being of PWD.

Lack of social contact and meaningful activities also contribute to lowering the quality of life for PWD (MacPherson, Bird, Anderson, Davis, & Blair, 2009). Unfortunately, in institutional care settings, it is estimated that PWD spend only 10% of their time in therapeutic or leisurely activities (Chung, 2004; Ice, 2002). This situation is even worse when their cognitive and functional impairments become more advanced (Buettner & Fitzsimmons, 2003; Kolanowski, Buettner, Litaker, & Yu, 2006). PWD still living in the community also lack social contact and meaningful activities (Meaney, Croke, & Kirby, 2005; Pruchno & Rose, 2002). When activities are made available for PWD, these activities tend to be both “childish” (Buettner & Fitzsimmons, 2003; Kovach & Henschel, 1996; Signore, 2007) and at the same time inappropriate, because they require cognitive capacity that may already be severely impaired by neurocognitive decline. All of these actions obviously violate PWD’s fundamental human rights “to participate in the cultural life of the community, to enjoy the arts and to share in scientific advancement and its benefits” (United Nations, 1948).

There is growing empirical evidence that engaging in the arts of all types (i.e., music, visual arts, drama, writing, and dance) is beneficial physiologically and psychologically. Cohen (2006) explained the physiological benefits from engaging in the arts. Weekly participation in creative activities provides social engagement that has been linked to improved cardiovascular, endocrinological, and immunological systems. Creative expression activities also create sustained challenges and new experiences that stimulate the development of new dendrites in the brain, improving the communication among brain cells (Cohen, 2006). Creative work results in slower heartbeat, lower blood pressure, slower breathing, balanced blood flow and hormone level, improved immune system, reduced pain, and causing the body to go into deep relaxation (Lane, 2005). Citing findings in neurophysiology research, Lane reported, “art, meditation, and healing... are all associated with similar brainwave patterns and mind-body changes” (p. 123).

In hospital and mental health settings, Staricoff’s (2007) review of 385 studies published in English between 1990 and 2004 showed that engaging in the arts reduced anxiety and depression in cancer patients; significantly reduced the length of hospital stay in intensive care units; reduced cortisol levels and blood pressure, while increasing sense of comfort in stressful medical procedure situations; reduced the use of pain medication after surgery; and reduced the use of sedatives during post-operative periods. Moreover, Staricoff found that in mental health settings, engagement in the arts made patients more calm, attentive and collaborative, thereby reducing the need for medication and physical restraints.

Similar findings were reported when assessing the impact of arts engagement on PWD. The benefits for PWD include: emotional outlet, calming effects, improved communication

and social interactions, facilitating reminiscence, assisting with diagnosis and evaluation of cognitive status, enhanced self-esteem and autonomy, increased concentration, and reduced depression (Jensen, 1997; Kahn-Denis, 1997; Kamar, 1997; Kovach & Henschel, 1996; Wald, 1993; Wood, 2002).

A review of 1,632 evidence-based studies of psychological interventions in dementia care yielded 162 studies for further analysis (Livingston, Johnston, Katona, Paton, & Lyketsos, 2005). The authors concluded that although engaging in the arts may provide PWD and/or their caregivers with momentary pleasure, the study findings are contradictory and inconclusive. Rusted, Sheppard, and Waller (2006) summarized the state of research in art therapy as follows: "In general there is little adequately controlled, systematic, evidenced based research conducted on the use of the art, drama, or music therapy with this particular [dementia] client group" (p. 518). The National Academy of Sciences (NAS) concurred with this observation. In their 2013 review of research articles on creative arts and dementia, they concluded that most of these studies have samples that are too small, not randomized, poorly defined, and have no control groups. In addition, they found that the arts interventions themselves are not well-defined or documented, in terms of the frequency and intensity of the activity (Kent & Li, 2013). The overall problem, however, is that biomedical research designs oftentimes inappropriately force rigid randomized control trials upon creative-expressive art activities for PWD and tend to miss the real-time benefits and values for the participants.

Research on informal/social art activities in dementia care is even more limited than research in formal/medical art therapy. The fact that art therapy is an established field of study with graduate degrees, professional associations, and journals, is undoubtedly a factor. Nevertheless, there are a few studies that assess the impact of art programming conducted by teaching artists or activities professionals, not licensed art therapists, on the well-being of PWD. Below are three studies conducted by teaching artists that utilized the Greater Cincinnati Chapter Well-Being Observation Tool (GCCWOT), in its original and modified versions.

The impact of Memories in the Making (MIM) on the quality of life of PWD was assessed by Kinney and Rentz (2005). Using the GCCWOT, they observed 12 PWD at two adult day centers engaged in art making and in another structured activity such as current events, word games, and crafts. They found that "participants demonstrated significantly higher levels of interest, sustained attention, pleasure, self-esteem, and normalcy during Memories in the Making than during the other activity" (p. 225).

Replication of the above study was conducted by Gross, Danilova, Vandehey, and Diekhoff (2015). This study measured the impact of MIM beyond the session itself. Seventy-six PWD with the average age of 84.28 were observed using the same GCCWOT over a 12-week period. Three measurements were taken, at the beginning, middle, and end of the 12 weeks by interns and staff members. Although interns observed improvements during the MIM sessions, the staff members reported no significant changes in PWD's well-being over the 12-week period.

The Scripps Modified Greater Cincinnati Chapter Well-Being Observational Tool (SM-GCCWOT) was used to evaluate the impact of the Opening Minds through Art (OMA) program on the well-being of PWD (Sauer, Fopma-Loy, Kinney, & Lokon, 2014). OMA is an intergenerational art program for PWD where PWD are paired to work one-on-one to create art with the support of trained volunteers. Video recordings of 38 PWD were analyzed. The results showed that PWD experience moderate or high degrees

of well-being with little to no ill-being during the OMA sessions. When compared to traditional arts and crafts activities (e.g., scrapbooking and coloring), a subsample of 10 PWD showed significantly higher intensity scores on engagement and pleasure and lower intensity scores on disengagement during OMA.

Thus, although review of the literature provides some support for the positive impact of participation in creative arts activities on the well-being of PWD, many of these studies lack the use of standardized outcome measures, clarity and consistency of the intervention, and often focused on decreasing problematic behaviors rather than improving well-being (Beard, 2012; de Medeiros & Basting, 2014). This study aims to address some of these limitations. In this study, we investigate the validity of the SM-GCCWOT. We then raise the question how the different types of art programming affect the levels of well-/ill-being of PWD.

Creative arts engagement can be categorized into two types based on the qualification of the person conducting the creative engagement session and the goals of the session. In the formal/medical version, trained and certified/licensed therapists facilitate the art activities; the goal is to “improve or restore a client’s functioning and his or her sense of personal well-being” (American Art Therapy Association, 2013). Rubin (2001), a leading theorist in the field of art therapy, states that “a good art therapist has some notion of what is ‘wrong’ as well as some ideas about how to facilitate a process of getting ‘better’” (pp. 2–3). Furthermore, Kasayka (2001) lists the following goals for art therapy: “Increasing orientation and activation, facilitating reminiscence and remembering, increasing self-understanding and acceptance, developing meaningful interpersonal relationships, and building communal spirit” (pp. 10–11). If attained, these goals are expected to have a positive impact on the quality of life of PWD.

Similar healing goals are stated for the other forms of creative expression therapies. The American Music Therapy Association (AMTA), for example, states that in music therapy “music is used within a therapeutic relationship to address physical, emotional, cognitive, and social needs of individuals” (AMTA, n.d.). With people who have dementia, music therapy interventions “can be designed to promote wellness, manage stress, alleviate pain, enhance memory, improve communication, and provide unique opportunities for interaction” (AMTA, n.d.).

Within the field of formal art therapy, there is further distinction between interventionist and non-interventionist approach to art therapy. The interventionist approach, as the term suggests, has the goal of reduction of behavioral and psychological symptoms, rather than improving quality of life (Beard, 2012). Although the final outcome may be an improved quality of life, interventionist therapists tend to focus on outcomes measured with objectively administered scales to indicate progress in the healing process rather than focusing on life enrichment and subjective well-being.

The non-interventionist approach to art therapy, in contrast, has the goal of life enrichment. The act of creating art is itself the source of enrichment, without interpretation or analysis by the art therapist (Adamson, 1991). Another term for this non-interventionist approach to art therapy is “art as therapy.”

The goals of non-interventionist approach to formal art therapy are similar to the goals of the informal/social forms of creative arts engagement. However, the art-making sessions in informal art programs are not conducted by licensed art therapists. Instead, these sessions are conducted by teaching artists, family members, activity staff, volunteers, or direct-care workers. Although the activity may seem to be therapeutic to the person with dementia, informal art programming does not explicitly have therapeutic goals. The goals of informal

art programming tend to focus more on increasing opportunities for self-expression, communication, and relationship building.

The informal/social forms of creative arts engagement can be further divided into two subcategories: those that are conducted by teaching artists and those that are conducted by non-artists. Teaching artists tend to provide PWD with more opportunities for creative and emotional self-expressions. Non-artist activity professionals, family members, direct-care workers, on the other hand, tend to engage PWD in non-customized, standard art activities in order to maintain and preserve remaining skills such as cutting, gluing, and coloring. Abraham (2005) considers these types of activities as occupational therapy rather than creative arts engagement. Due to the lack of opportunity for creative individuality and emotional expression, this third type of activity is best described as “craft” rather than “art” activity. This type of craft activity is the most commonly practiced version in long-term care and adult day care settings. There are plenty of “idea books” for such activities, utilizing inexpensive and readily available materials, with very little preparation and artistic skill needed on the part of the facilitators. Some examples of activities are coloring books, cutting and gluing magazine pictures, scrap-booking, cutting snowflakes for winter decoration. For people with moderate to later stages of dementia, the manual skills required to succeed in these coloring and cutting craft activities may be limited. These pejorative activities outright contribute to what Kitwood called a “malignant social psychology” for PWD.

In this study, we compare the impact of formal and informal creative arts engagement with each other and with non-creative (NOC) activities, as well as the absence of activities, on the well-being of PWD.

## Research goals and questions

There are two goals for the present study. The first is to investigate the reliability and validity of the SM-GCCWOT. The second is to use the SM-GCCWOT to compare the impact of the following activities on the well-being of PWD:

**Table 1.** List of different types of activities observed.

AMT—Art/Music Therapy	Art/Music therapy conducted by certified and licensed art and music therapists.
OMA—Opening Minds through Art	Art/music intergenerational activity conducted by teaching artists.
CRS—Creative Regular Staff	Creative activities conducted by non-artist, regular activities staff.
NOC—Non-Creative	Non-creative activities conducted by activities professionals.
NOA—No Activity	No activity at all.

The goal of this study is to address four research questions. First, is the SM-GCCWOT a valid tool for measuring well- and ill-being in PWD? Second, do PWD experience improved well-being when they engage in activities of any kind (creative or not) compared with having no activity (NOA) at all? Third, are creative activities better at promoting the well-being of PWD compared to non-creative (NOC) activities? Fourth, what difference, if any, does it make for the well-being of PWD when the creative activities are conducted by (a) a licensed



art/music therapist (AMT), (b) a teaching artist who is not a licensed therapist, or (c) an activity professional who is not an artist, nor an art or music therapist?

## Methods

### *Sample and observation procedures*

Data used in this study include 567 observations across the five different activity types from  $N=67$  participants (54 or 80% female; 13 or 20% males) with moderate to severe dementia, who resided in a Midwestern continuing care retirement community and a skilled nursing facility. Each participant was observed during activity sessions that last between 20–60 minutes. Each set of observations for the same individual, containing the five *different* types of activities, were completed within a four-week period. All of the activities (cf. Table 1) were conducted in small group settings. The art and music therapists observed for this study took the non-interventionist approach to art and music therapy (i.e., focusing on improving quality of life rather than reducing behavioral and psychological symptoms). Both the art and music therapists (formal arts engagement) and the teaching artists in OMA (informal arts engagement) have the same goal of improving quality of life of PWD. One distinction between the two types of activities is that the OMA program utilizes trained volunteers who sit with the PWD and support their creative process on a 1:1 ratio, but at the same time still ensure a group environment by putting two or three pairs at each table.

After receiving the approval of the Institutional Review Board at Miami University, consent for study participation was sought from the primary caregiver and/or family member of the study participants. On the day of data collection, we asked participants for their assent to take part in this study. Data collection took place across three semesters, between September 2014 and December 2015. Observers were trained research assistants who had received 11 hours of training on how to use the instrument. When they reached an inter-rater agreement of at least 85% with the trainers, the research assistants were allowed to conduct observations at the nursing facility. Recalibration sessions were held at the start of every semester. All observations were conducted in real-time.

### *Observation instrument*

The instrument used in this study is the *Scripps Modified Greater Cincinnati Chapter Well-Being Observational Tool* which measures the intensity and frequency of two domains: well-being and ill-being. The well-being domain comprises three subdomains (i.e., social interest (SOC), engagement (ENG), and pleasure (PLE)). The ill-being domain, on the other hand, comprises four subdomains (i.e., disengagement (DIS), negative affect (NEG), sadness (SAD), and confusion (CON)). Each observation was coded in 5-minute time intervals up to 60 minutes. For instance, an observation lasted 40 minutes would have eight measured intervals, but a 60-minute session would include 12 discrete observations. For each 5-minute interval, scores were marked as 0 (none), 1 (low), 3 (moderate), and 5 (high) for the intensity, and 0 (never), 1 (infrequently), 3 (sometimes), and 5 (most of the time) for the frequency of the observed activities.

In order to transform the arbitrarily defined, discrete, ordinal scores for a number of observation intervals into one continuous measurement to represent one subdomain score in each activity, the percentage of time that a participant was scored 3 or 5 for intensity or frequency (i.e., moderate/high for intensity or sometimes/most of the times for frequency)

during the entire observation period is calculated as the aggregated subdomain score for each observation. The subdomain score represents the percentage of time that a participant was observed to have moderate or high amount of well-being and/or ill-being during a whole activity session. For example, an aggregated score of 50% on the intensity of social interest means that the participants exhibited a moderate or high intensity level of social interest during half of the observed time (i.e., scored 3 or 5 in 4 observation intervals during a 40-minute activity session). The aggregated scores allow the researchers to analyze the subdomains at the activity level, instead of at each observation interval level.

A copy and in-depth description of the SM-GCCWOT can be found in a previously published article (Sauer et al., 2014).

## Data analysis

A principal component analysis (PCA) was conducted to validate the internal structure of the seven subdomains (Jolliffe, 2002). PCA was conducted for intensity and frequency. Varimax rotation with Kaiser normalization was used to better explain the latent construct derived from PCA analysis. Since this is an exploratory analysis, two rounds of PCA analyses were performed. The first round examined the number of factors loaded with eigenvalues greater than 1. This step examined how many factors these seven subdomains naturally form. The second round restricted the number of factors to two. Since the SM-GCCWOT instrument hypothetically formed two domains or factors (i.e., well-being and ill-being), this step was applied to examine whether the factors and their subdomains actually hang together as they were designed to do. Next, after defining well-being and ill-being factors based on PCA results, the well-being and ill-being factor scores were calculated as the means of the aggregated subdomain scores (with reverse coding for certain subdomains if needed). Finally, Cronbach's alpha was used to examine the internal consistency reliability of the final two factors, i.e., how closely related a set of subdomains are as a domain (Cronbach, 1951).

The percentage of moderate to high intensity and frequency scores were compared across five activity types using one-way ANOVA. Tukey post hoc tests were used for pair-wise comparisons.

Staff-to-resident ratio was calculated using the number of staff divided by the number of PWDs in a particular activity session. Staff-to-resident ratio for OMA is manually set as 1, because every person with dementia has a trained volunteer by his/her side throughout the session. Pearson correlation tests were conducted between staff-to-resident ratios and well-being domain and subdomain scores.

All statistically significant results were reported at  $p < 0.05$  level, unless otherwise specified. IBM SPSS Version 22.0 (IBM Corp., 2013) was used for all analyses.

## Results

### *Instrument validation/reliability check*

The first goal of this project was to validate the SM-GCCWOT instrument. Since there was no previous validation published for this instrument, this study examined both the validity and reliability of the instrument using an exploratory approach.

PCA with varimax rotation yielded three factors for intensity measures and two factors for frequency measures with eigenvalues greater than 1. SOC, ENG, PLE, and DIS loaded as



**Table 2.** Factor loadings of percentage of moderate to high intensity and frequency scores.

Restricted to two factors	Intensity		Frequency	
	Factor 1: Well-being	Factor 2: Ill-being	Factor 1: Well-being	Factor 2: Ill-being
Social interest	0.67		0.68	
Engagement	0.76		0.79	
Pleasure	0.73		0.63	
Disengagement	-0.79		-0.86	
Negative affect		0.80		0.79
Sadness		0.32		0.57
Confusion		0.48		0.31
Total variance	48%		48%	

one factor for both measures; NEG and CON were loaded on the second factor and SAD loaded on the third for intensity; NEG, SAD, and CON loaded as the second factor for frequency. The loaded factors explained 62% of the total variance for intensity measures and 48% for frequency measures. In the original instrument (Sauer et al., 2014), well-being includes SOC, ENG, and PLE; while ill-being includes DIS, NEG, SAD, and CON. However, PCA revealed that disengagement consistently loaded on the well-being factor negatively across both measures (i.e., intensity, frequency), instead of the ill-being factor. Once restricting the number of factors to two, the subdomains of SOC, ENG, PLE, and DIS loaded as one factor for both measures and NEG, SAD, and CON loaded on the other factor for intensity and frequency measures (cf. Table 2). The two factors together explained 48% of the total variances in the seven subdomains for both measures. This exploratory analysis shows that it is reasonable to consider SOC, ENG, PLE, and DIS (reverse coded) as the well-being domain (factor) and NEG, SAD, and CON as the ill-being domain (factor).

As shown in Table 3, the well-being factor showed acceptable internal consistency reliability levels for both measures. However, the ill-being factor showed very low reliabilities. This could be caused by the very small variations on the three ill-being subdomains. Future analysis using this factor should be interpreted with caution.

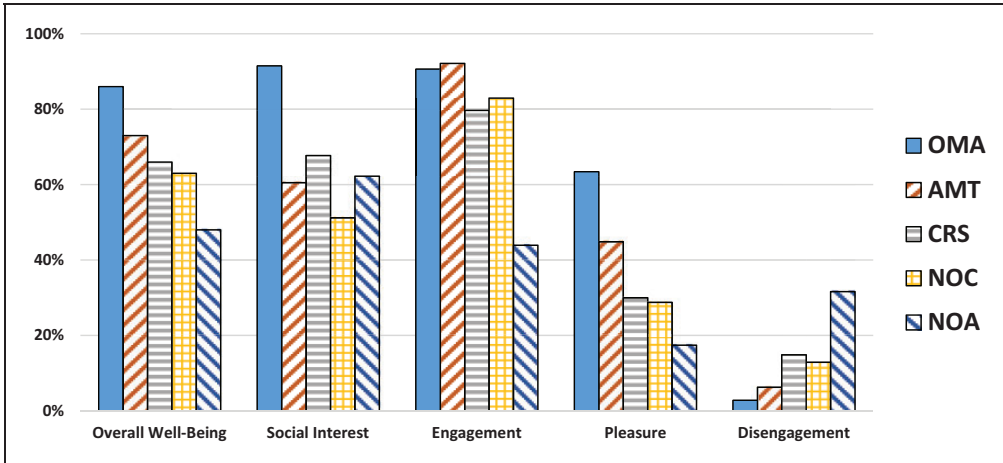
In summary, PCA and internal consistency reliability results showed that four subdomains (i.e., SOC, ENG, PLE, and DIS) formed a valid and reliable “well-being” factor/domain. Even though PCA showed that the other three subdomains (i.e., negative affect, sadness, and confusion) tended to form an “ill-being” factor, the values of these three subdomains rarely measured anything but zero nor formed a reliable factor, thus need to be interpreted with caution. The well-being and ill-being factor scores were calculated as the means of the aggregated subdomain scores.

### *Comparisons of well-being and its subdomain scores by activity type*

One-way ANOVA revealed that there were significant differences among the impact of the five activity types on intensity and frequency for overall well-being and its four subdomains ( $p < .001$  for all ANOVA tests with  $F(4, 526)$  ranging between 9.71 and 64.03). Results for post hoc pairwise comparisons of each measure are presented in detail below.

**Table 3.** Cronbach's alpha for each factor on percentage of moderate to high intensity and frequency scores (number of observations = 567).

Factors	Intensity	Frequency	Intensity × frequency
Well-being (4 subdomains)	0.72	0.73	0.70
Ill-being (3 subdomains)	0.13	0.11	0.09



**Figure 1.** Mean % of moderate to high intensity for overall well-being and its subdomains.

*Intensity.* Figure 1 and Table 4 show the percentage of moderate to high intensity scores for the well-being domain and its four subdomains across the five activity types. Overall, any activity (both creative and non-creative activities regardless of who conducted the activity) contributed significantly to the overall intensity of well-being for PWD when compared to no activity at all. When there were no activities, the PWD in this study showed significantly less intense engagement and more intense disengagement than when there was an activity going on, regardless of the activity type. It is interesting to note an exception to this pattern. During non-creative activity, PWD showed significantly less intense social interest than during no activities. OMA generated significantly higher overall well-being, social interest, and pleasure compared to all the other activity types.

Creative activities conducted by the art and music therapists contributed to significantly higher overall well-being and pleasure than non-creative activities. Although the impact of creative activities conducted by the art and music therapists on the overall intensity of well-being of PWD was greater than creative activities conducted by regular staff members (creative regular staff (CRS)), this difference was not statistically significant.

There was no significant difference in the impact on overall intensity of well-being of PWD when regular activities staff conducted creative (CRS) and non-creative (NOC) activities.

**Table 4.** Mean % of moderate to high intensity for well-being and its subdomains.

Factor/Domain:	Mean (SD)*				
	OMA	AMT	CRS	NOC	NOA
Overall well-being	86% (0.15) <sup>a</sup>	73% (0.21) <sup>b</sup>	66% (0.22) <sup>c</sup>	63% (0.23) <sup>d</sup>	48% (0.27)
Social interest	91% (0.18) <sup>a</sup>	61% (0.4)	68% (0.38)	51% (0.38) <sup>e</sup>	62% (0.39)
Engagement	91% (0.14)	92% (0.18)	80% (0.31)	83% (0.3)	44% (0.41) <sup>f</sup>
Pleasure	63% (0.37) <sup>a</sup>	45% (0.39) <sup>b</sup>	30% (0.35)	29% (0.32) <sup>d</sup>	17% (0.29)
Disengagement	3% (0.14)	6% (0.17)	15% (0.25)	13% (0.28)	32% (0.4) <sup>g</sup>

\*All the differences were statistically significant at  $p < .05$ .

Tukey post hoc pairwise tests showed that:

<sup>a</sup>OMA had significantly higher % of moderate to high intensity than AMT, CRS, NOC, and NOA.

<sup>b</sup>AMT had significantly higher % of moderate to high intensity than NOC and NOA.

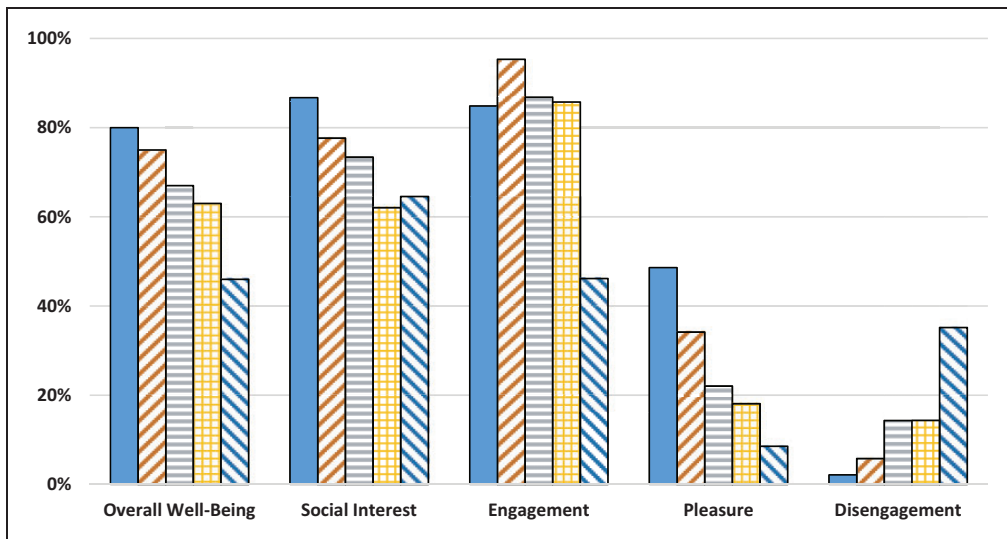
<sup>c</sup>CRS had significantly higher % of moderate to high intensity than NOA.

<sup>d</sup>NOC had significantly higher % of moderate to high intensity than NOA.

<sup>e</sup>NOC had significantly lower % of moderate to high intensity than NOA.

<sup>f</sup>OMA, AMT, CRS, and NOC had significantly higher % of moderate to high intensity than NOA.

<sup>g</sup>OMA, AMT, CRS, and NOC had significantly lower % of moderate to high intensity than NOA.



**Figure 2.** Mean % of moderate to high frequency for overall well-being and its subdomains.

*Frequency.* Figure 2 and Table 5 show the percentage of moderate to high frequency scores for well-being overall and for the four subdomains across the five activity types. Similar to the pattern on intensity, all activities significantly contributed to the overall frequency of well-being for PWD when compared to no activities at all. When there were activities taking place, PWD showed significantly more frequent engagement, more pleasure, and less frequent disengagement than when there were no activities at all. During OMA, PWD in this study showed pleasure more frequently than during the other activity types. They also showed more frequent social interest during OMA and during art and music therapy sessions than during

**Table 5.** Mean % of moderate to high frequency for overall well-being and its subdomains.

Factor/Domain:	Mean (SD)*				
	OMA	AMT	CRS	NOC	NOA
Overall well-being	80% (0.16) <sup>a</sup>	75% (0.17) <sup>b</sup>	67% (0.19) <sup>c</sup>	63% (0.22) <sup>d</sup>	46% (0.26)
Social interest	87% (0.22) <sup>e</sup>	78% (0.33) <sup>f</sup>	73% (0.37)	62% (0.39)	65% (0.38)
Engagement	85% (0.19)	95% (0.13)	87% (0.2)	86% (0.28)	46% (0.4) <sup>g</sup>
Pleasure	49% (0.41) <sup>h</sup>	34% (0.34) <sup>b</sup>	22% (0.32)	18% (0.29) <sup>d</sup>	9% (0.22)
Disengagement	2% (0.11) <sup>i</sup>	6% (0.15)	14% (0.23)	14% (0.28)	35% (0.39) <sup>j</sup>

\*All the differences were statistically significant at  $p < .05$ .

Tukey post hoc pairwise tests showed that:

<sup>a</sup>OMA had significantly higher % of moderate to high frequency than CRS, NOC, and NOA.

<sup>b</sup>AMT had significantly higher % of moderate to high frequency than NOC and NOA.

<sup>c</sup>CRS had significantly higher % of moderate to high frequency than NOA.

<sup>d</sup>NOC had significantly higher % of moderate to high frequency than NOA.

<sup>e</sup>OMA had significantly higher % of moderate to high frequency than NOC and NOA.

<sup>f</sup>AMT had significantly higher % of moderate to high frequency than NOC.

<sup>g</sup>OMA, AMT, CRS, and NOC had significantly higher % of moderate to high frequency than NOA.

<sup>h</sup>OMA had significantly higher % of moderate to high frequency than AMT, CRS, NOC, and NOA.

<sup>i</sup>OMA had significantly lower % of moderate to high frequency than NOC.

<sup>j</sup>OMA, AMT, CRS, and NOC had significantly lower % of moderate to high frequency than NOA.

non-creative activities. Their overall well-being frequency scores were significantly higher when the creative activity was conducted by a teaching artist during OMA than when it was conducted by regular activity staff members (CRS). However, there was no significant difference in overall well-being frequency when the creative activities were conducted by teaching artists (OMA) and when they were conducted by the art and music therapists (AMTs). When comparing overall frequency of well-being during creative activities conducted by the art and music therapists (AMTs) with those conducted by regular staff (CRS), the difference was also statistically insignificant. Likewise, there was no significant difference in the impact on overall frequency of well-being of PWD when regular activities staff conducted creative (CRS) and non-creative (NOC) activities.

### *Correlation between staff-to-resident ratio and well-being*

In order to better understand OMA's superior impact on the well-being of PWD, we explored the connection between the staff-to-resident ratio and overall well-being scores. The ratios were computed for each activity type. Table 6 shows the number of observations for each activity type and the mean ratio between staff and residents. OMA's ratio was set to 1, because every person with dementia has a trained volunteer by his/her side throughout the entire session. The mean for art and music therapy (AMT) is 0.23, or approximately 4–5 residents per staff member, or 0.18 ratio. In creative activities conducted by regular staff members (CRS), there were between 5 and 6 residents per staff member. And in non-creative (NOC) activity, the ratio is about 4–5 residents per staff member, or 0.22 ratio. No activities (NOA) was excluded, because we are primarily interested in staff ratios when actual activities were taking place.

As evident in Table 7, there were moderately strong positive correlations between well-being and staff-to-resident ratios. Higher staffing ratios resulted in higher overall intensity

**Table 6.** Staff-PWD ratio (with OMA ratios adjusted to 1) by activity type.

Activity type	No. of observations	<i>M</i>	<i>SD</i>
OMA	99	1.00	0.00
AMT	60	0.23	0.18
CRS	42	0.18	0.05
NOC	172	0.22	0.12
Total	373	0.42	0.36

and frequency of well-being for PWD. Surprisingly, the exception here was the subdomain engagement which was not positively correlated with higher staff-to-resident ratios.

## Discussion

The purpose of this study was to first assess the validity of the SM-GCCWOT as an instrument for measuring well- and ill-being in PWD. The results of the exploratory principle component analysis indicated that this observational tool does load on two factors: (a) well-being and (b) ill-being. However, the subdomain of disengagement (DIS) loads on the domain of well-being instead of ill-being. As can be seen in Appendix 1, ill-being is hardly detected by the tool at all. This finding is consistent with our previous study (Sauer et al., 2014). Therefore, future use of the tool should only focus on the well-being domain, comprising the subdomains of Social interest, Engagement, Pleasure, and Disengagement (SOC, ENG, PLE, and DIS). This conclusion supports Burgener and Chiverton's (1992) recommendation that psychological well-being in PWD is best represented by combining both positive and negative affects. This finding calls for further modification and simplification of the observation tool. In future studies, we recommend that the remaining ill-being domains should be eliminated.

The findings presented here clearly indicate that the participants experienced significantly more frequent and intense overall well-being during any and all activities than during no activities (NOA). And their well-being scores were highest during OMA, a structured intergenerational program with 1:1 ratio between staff/volunteer and PWD. Further look into the relationship between well-being and staffing ratios confirmed this positive correlation.

In addition, the participants did not exhibit significantly more frequent or intense well-being when the creative activities were conducted by art and music therapists when compared to those conducted by regular activity staff members. This is possibly due to the fact that regular staff members frequently assisted the art and music therapists in conducting creative activities that they ended up transferring similar practices when they conducted their own creative activities without the therapists.

This study also found that there were no significant impact differences between creative and non-creative activities conducted by regular activity staff members. With similar ratios of 4–6 residents per staff member in these activities, the type of activities conducted by the same staff members made no difference in the well-being of the residents with dementia.

There were two exceptions to the above trends. During non-creative activities, the participants showed less intense social interest than when there were no activities at all.

**Table 7.** Pearson correlation coefficients between staff–PWD ratio and domain/subdomain scores (number of observations = 373).

Measurement	Domain/subdomain				Overall well-being
	SOC	ENG	PLE	DIS	
Intensity	.432*	0.086	.360*	−.169*	.398*
Frequency	.245*	−0.059	.318*	−.183*	.274*
Intensity*frequency	.415*	0.004	.357*	−.169*	.372*

\*Correlation is significant at the 0.01 level (2-tailed).

This suggests that there were perhaps fewer opportunities for social engagement during non-creative activities. The other anomaly was the lack of relationship between staff ratios and engagement. While there is a correlation between staff ratios and frequency and intensity of overall well-being, social interest, pleasure, and disengagement, there was no significant relationship between staff ratios and engagement. This is counter intuitive and we have no explanation for this anomaly.

These variations in degrees of well-being have implications for (a) person-centered approach to activity preferences; (b) the activity design and staff ratios. Each person with dementia is a unique individual with unique preferences in tastes when it comes to activity. Ideally, observational and interview data would be collected for each resident to assess their activity preferences. If PWD are provided with activities that they prefer, naturally these activities will promote their well-being.

As presented in the results, OMA activities clearly separated themselves from the other activities types. What is unique about OMA that makes it stand out? In addition to the 1:1 ratio, which distinguishes OMA from the other activities, OMA is unique because it is an intergenerational art program specifically designed for PWD. It is based on person-centered philosophy that is grounded in best practices in dementia research literature. Furthermore, OMA is relationship based. Volunteers are partnered with the same resident with dementia for the 10–12 weekly sessions. These volunteers receive 3.5 to 4.5 hours of training prior to volunteering for the first time and are monitored through reflective journal writing. The volunteers are trained to assist, reassure, and encourage PWD to discover and express their creativity. The program is highly structured with failure-free activities so that PWD can be active agents in their own creative expression. PWD were given the opportunity to share their work amongst each other, but also share them publically through art shows twice a year, which generated staff and family support for the program. Enveloped in such support from volunteers, staff members, and families, PWD flourished in OMA. Their well-being scores in this study reflected this flourishing.

## Limitations

Regarding staff-to-resident ratios, the questions that need to be asked are: What is the impact of the other activity types if they also maintain a 1:1 ratio? Is there a threshold ratio value at which well-being significantly increases? What is the best way to measure this ratio across different activity types? Does ratio alone contribute to differences in impact for PWD? How do the roles and competences of the additional staff/volunteers



affect PWD's well-being? If staff/volunteers are present in the room, but assume a passive role or feel uncomfortable interacting with PWD, increasing ratios alone would not necessarily increase the well-being of PWD. Further research needs to be carefully designed to address the above questions.

Future research also needs to be conducted to compare arts interventions conducted by teaching artists and creative arts therapists that take place in 1:1 settings. Our IRB protocol prevented us from collecting data in residents' private rooms, where one-on-one art and music therapy sessions took place at this facility. Additionally, more light could be shed on the impact of different activity types by comparing observations of one-on-one programming for PWD involving creative and non-creative activities. For example, OMA could be compared with a technology tutorial or exercise program involving a person with dementia and a volunteer or caregiver.

## Conclusion

In this study,  $N=67$  PWD were observed during five different activity types: the intergenerational art program OMA, art and music therapy sessions, creative activities conducted by regular activity staff members, non-creative activities conducted by regular activity staff members, and no activities at all. There were 567 observations made in total. The results of the mean comparisons demonstrated that PWD expressed significantly more intense and frequent well-being during all activities when compared to no activities at all. And during OMA, PWD showed the highest well-being scores when compared with the other activities. However, there was no significant difference in the overall well-being of PWD when the creative activities were conducted by licensed art/music therapists or by regular activity staff members. Likewise, there was no significant difference in the well-being of PWD when the regular activity staff members conducted creative activities or non-creative activities. The implication of these findings is that PWD benefit from having activities, regardless of the type of activities (creative or non-creative), or who conducts them (licensed therapists or activity staff). But to create significant improvement in their well-being, PWD need well-designed activities with 1:1 ratio between PWD and well-trained volunteers/staff members. To better understand the relationship between staff/volunteer to PWD ratio and the well-being of PWD, further studies need to be conducted to compare one-on-one creative and non-creative activities and one-on-one creative activities conducted by teaching artists vs. art therapists.

Based on the exploratory results presented in this study, we propose three things. First, the observation tool should be simplified by dropping the ill-being factor and including the subdomains of Social interest, Engagement, Pleasure, and Disengagement (SOC, ENG, PLE, and DIS) to the factor of well-being. Second, in order to truly tap into the expressive capabilities of PWD and elicit the greatest amount of well-being in both frequency and intensity, a rigorous program design is necessary that is evidence-based. Lastly, having a 1:1 staff/volunteer-to-PWD ratio is the basic requirement to achieve the best possible results. When all these parts come together, their synergistic effects can unleash capabilities in PWD that were thought to be lost or non-achievable. The benefits of well-designed and well-conducted creative-expressive activities for PWD are powerful in that they truly provide person-centered care and not only benefit the individuals themselves, as well as the facilities, but also demonstrate to society in general that PWD are highly capable of expressing themselves creatively if they are encouraged and allowed to do so.

## Acknowledgment

We are grateful to Cedar Village Retirement Community in Mason, OH for their on-going support for our research. Our gratitude also goes to Jessica Sebastian, art therapist and June Jones, music therapist at Cedar Village for being open and supportive to our observations. We would like to thank Jennifer Dibert, Jyotsana Parajuli, Anju Paudel, Elizabeth Rohrbaugh, Greg Thoeke, and Claire Wickersham for their assistance in data collection and data entry for this project. Special thanks go to Jennifer Dibert for managing this data collection process and for training the research assistants.

## Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

## Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: David and Nancy Wolf of Cincinnati, Ohio.

## References

- Abraham, R. (2005). *When words have lost their meaning: Alzheimer's patients communicate through art*. Westport, CT: Praeger.
- Adamson, E. (1991). *Art as healing*. London: Coventure, Ltd.
- Alzheimer's Disease International. (2015). World Alzheimer report 2015: The global impact of dementia. Retrieved from <http://www.alz.co.uk/research/WorldAlzheimerReport2015-sheet.pdf>
- American Art Therapy Association. (2013). What is art therapy? Retrieved from <http://www.arttherapy.org/upload/whatisarttherapy.pdf>
- American Music Therapy Association (AMTA). (n.d.). What is music therapy? Retrieved from <http://www.musictherapy.org/about/musictherapy>
- Beard, R. L. (2012). Art therapies and dementia care: A systematic review. *Dementia, 11*(5), 633–656.
- Buettner, L. L., & Fitzsimmons, S. (2003). Activity calendars for older adults with dementia: What you see is not what you get. *American Journal of Alzheimer's Disease and Other Dementias, 18*(4), 215–226 doi:10.1177/153331750301800405.
- Burgener, S. C., & Chiverton, P. (1992). Conceptualizing psychological well-being in cognitively-impaired older persons. *The Journal of Nursing Scholarship, 24*(3), 209–214.
- Chung, J. C. C. (2004). Activity participation and well-being of people in long-term care settings. *Occupational Therapy Journal of Research, 24*, 22–31.
- Cohen, D. G. (2006). Research on creativity and aging: The positive impact of the arts on health and illness. *Generations, 30*(1), 7–15.
- Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika, 16*, 297–334.
- de Medeiros, K., & Basting, A. (2014). Shall I compare thee to a dose of donepezil?: Cultural arts interventions in dementia care research. *Gerontologist, 54*(3), 344–353.
- Gross, S. M., Danilova, D., Vandehey, M. A., & Diekhoff, G. M. (2015). Creativity and dementia: Does artistic activity affect well-being beyond the art class? *Dementia (14713012), 14*(1), 27–46 doi:10.1177/1471301213488899.
- Corp, IBM (2013). *IBM SPSS statistics for Windows, Version 22.0*. Armonk, NY: IBM Corp.
- Ice, G. (2002). Daily life in a nursing home: Has it changed in 25 years? *Journal of Aging Studies, 16*, 345–359.

- Jensen, S. M. (1997). Multiple pathways to self: A multisensory art experience. *Art Therapy: Journal of the American Art Therapy Association*, 4(3), 178–186.
- Jolliffe, I. T. (2002). *Principal component analysis* (2nd ed.). New York, NY: Springer.
- Kahn-Denis, K. B. (1997). Art therapy with geriatric dementia clients. *Art Therapy: Journal of the American Art Therapy Association*, 14(3), 194–199.
- Kamar, O. (1997). Light and death: Art therapy with a patient with Alzheimer's disease. *American Journal of Art Therapy*, 35(4), 118–124.
- Kasayka, R. E. (2001). Introduction. In A. Innes, & K. Hatfield (Eds.), *Healing arts therapies and person-centered care* (pp. 9–17). London: Jessica Kingsley Publishers.
- Kent, M., & Li, R. (2013). *The arts and aging: Building the science*. Washington, DC: National Endowment for the Arts Office of Research and Analysis.
- Kinney, J. M., & Rentz, C. A. (2005). Observed well-being among individuals with dementia: Memories in the Making, an art program, versus other structured activity. *American Journal of Alzheimer's Disease and other Dementias*, 20(4), 220–227.
- Kitwood, T. (1997). *Dementia reconsidered: The person comes first*. Buckingham, UK: Open University Press.
- Kitwood, T. (1998). Toward a theory of dementia care: Ethics and interaction. *The Journal of Clinical Ethics*, 9, 23–34.
- Kolanowski, A., Buettner, L., Litaker, M., & Yu, F. (2006). Factors that relate to activity engagement in nursing home residents. *American Journal of Alzheimer's Disease and Other Dementias*, 21(1), 15–22.
- Kovach, C. R., & Henschel, H. (1996). Behavior and participation during therapeutic activities on special care units. *Activities, Adaptation & Aging*, 20(4), 35–45.
- Lane, M. R. (2005, May/June). Creativity and spirituality in nursing. *Holistic Nursing Practice*, 122–125.
- Livingston, G., Johnston, K., Katona, C., Paton, J., & Lyketsos, C. G. (2005). Systematic review of psychological approaches to the management of neuropsychiatric symptoms of dementia. *American Journal of Psychiatry*, 162(11), 1996–2021.
- MacPherson, S., Bird, M., Anderson, K., Davis, T., & Blair, A. (2009). An Art Gallery Access Programme for people with dementia: 'You do it for the moment'. *Aging & Mental Health*, 13(5), 744–752 doi:10.1080/13607860902918207.
- Meaney, A. M., Croke, M., & Kirby, M. (2005). Needs assessment in dementia. *International Journal of Geriatric Psychiatry*, 20, 322–329.
- Pruchno, R. A., & Rose, M. S. (2002). Time use by frail older people in different settings. *Journal of Applied Gerontology*, 21, 5–23.
- Rubin, J. A. (2001). *Approaches to art therapy*. New York, NY: Routledge.
- Rusted, J., Sheppard, L., & Waller, D. (2006). A multi-centre randomized control group trial on the use of art therapy for older people with dementia. *Group Analysis*, 39(4), 517–536.
- Sauer, P., Fopma-Loy, J., Kinney, J., & Lokon, E. (2014). "It makes me feel like myself": Person-centered versus traditional visual arts activities for people with dementia. *Dementia: The International Journal of Social Research and Practice*, 15(5), 895–912.
- Signore, D. D. (2007). Review of kaleidoscope . . . color and form illuminate darkness: An exploration of art therapy and exercised for patients with dementia. *Art Therapy: Journal of the American Art Therapy Association*, 24(4), 195–196.
- Staricoff, R. L. (2007). Arts in health: A review of the medical literature. *Research Report 36*. London: Arts Council England.
- United Nations. (1948). The Universal Declaration of Human Rights: Article 27. Retrieved from <http://www.un.org/en/documents/udhr/>
- Wald, J. (1993). Art therapy and brain dysfunction in a patient with a dementing illness. *Art Therapy: Journal of the American Art Therapy Association*, 10(2), 88–95.
- Wood, M. J. M. (2002). Researching art therapy with people suffering from AIDS related dementia. *The Arts in Psychotherapy*, 29, 207–219.

## Author Biographies

**Elizabeth Lokon**, MGS, PhD is the founder and director of Opening Minds through Art (OMA) at Scripps Gerontology Center, Miami University. She is an artist, gerontologist, and educator. She is a frequent speaker on the intersection of the arts, dementia, and intergenerational service learning and has published her work in peer-reviewed journals. She continues to make art using fiber and glass.

**Philip E Sauer**, MGS is a doctoral candidate in social gerontology at Miami University. His research focuses on dementia as a global health issue and the evaluation of creative arts activities for people with dementia. Besides his work as a researcher, he has gained 14 months of practical experience assisting elders with their activities of daily living in long-term care settings and via home and community-based services in Germany.

**Yue Li**, MS, MEd is a Senior Research Associate and Project Team Leader at Discovery Center for Evaluation, Research, and Professional Learning and a doctoral candidate in Educational Leadership at Miami University. She has over 10 years of quantitative evaluation and research experience on more than 20 federal and state funded projects focusing on K-16 STEM education. Her research interests include educational evaluation and measurement, women, and underrepresented minority participation in STEM education and careers, inquiry-based science education in formal and informal settings, and translating teacher professional development into classrooms.

## Appendix I

**Table 8.** Average percentage of moderate or high intensity for each factor and subdomain by activity type.

Factor/domain: % of moderate to high intensity	Mean (SD)*				
	OMA	AMT	CRS	NOC	NOA
Well-being	86% (0.15) <sup>a</sup>	73% (0.21) <sup>b</sup>	66% (0.22) <sup>c</sup>	63% (0.23) <sup>d</sup>	48% (0.27)
Social interest	91% (0.18) <sup>a</sup>	61% (0.4)	68% (0.38)	51% (0.38) <sup>e</sup>	62% (0.39)
Engagement	91% (0.14)	92% (0.18)	80% (0.31)	83% (0.3)	44% (0.41) <sup>f</sup>
Pleasure	63% (0.37) <sup>a</sup>	45% (0.39) <sup>b</sup>	30% (0.35)	29% (0.32) <sup>d</sup>	17% (0.29)
Disengagement	3% (0.14)	6% (0.17)	15% (0.25)	13% (0.28)	32% (0.4) <sup>g</sup>
Ill-being	1% (0.04)	0% (0.02)	0% (0.01)	1% (0.04)	1% (0.05)
Negative affect	0% (0)	1% (0.06)	1% (0.03)	1% (0.09)	2% (0.12)
Sadness	1% (0.1)	0% (0)	0% (0)	1% (0.07)	1% (0.06)
Confusion	1% (0.07)	0% (0.03)	0% (0)	0% (0.02)	1% (0.06)

\*All the differences were statistically significant at  $p < .05$ .

<sup>a</sup>OMA had significantly higher % of moderate to high intensity than AMT, CRS, NOC, and NOA.

<sup>b</sup>AMT had significantly higher % of moderate to high intensity than NOC and NOA.

<sup>c</sup>CRS had significantly higher % of moderate to high intensity than NOA.

<sup>d</sup>NOC had significantly higher % of moderate to high intensity than NOA.

<sup>e</sup>NOC had significantly lower % of moderate to high intensity than NOA.

<sup>f</sup>OMA, AMT, CRS, and NOC had significantly higher % of moderate to high intensity than NOA.

<sup>g</sup>OMA, AMT, CRS, and NOC had significantly lower % of moderate to high intensity than NOA.

**Table 9.** Average percentage of moderate or high frequency for each factor and subdomain by activity type.

Factor/domain: % of moderate to high frequency	Mean (SD)*				
	OMA	AMT	CRS	NOC	NOA
Well-being	80% (0.16) <sup>a</sup>	75% (0.17) <sup>b</sup>	67% (0.19) <sup>c</sup>	63% (0.22) <sup>d</sup>	46% (0.26)
Social interest	87% (0.22) <sup>e</sup>	78% (0.33) <sup>f</sup>	73% (0.37)	62% (0.39)	65% (0.38)
Engagement	85% (0.19)	95% (0.13)	87% (0.2)	86% (0.28)	46% (0.4) <sup>g</sup>
Pleasure	49% (0.41) <sup>h</sup>	34% (0.34) <sup>b</sup>	22% (0.32)	18% (0.29) <sup>d</sup>	9% (0.22)
Disengagement	2% (0.11) <sup>i</sup>	6% (0.15)	14% (0.23)	14% (0.28)	35% (0.39) <sup>i</sup>
Ill-being	0% (0.03)	1% (0.03)	0% (0.01)	1% (0.04)	1% (0.04)
Negative affect	0% (0)	1% (0.06)	0% (0)	1% (0.08)	2% (0.1)
Sadness	1% (0.07)	0% (0)	1% (0.04)	1% (0.07)	0% (0.02)
Confusion	1% (0.06)	1% (0.08)	0% (0)	0% (0)	0% (0.03)

\*All the differences were statistically significant at  $p < .05$ .

<sup>a</sup>OMA had significantly higher % of moderate to high frequency than CRS, NOC, and NOA.

<sup>b</sup>AMT had significantly higher % of moderate to high frequency than NOC and NOA.

<sup>c</sup>CRS had significantly higher % of moderate to high frequency than NOA.

<sup>d</sup>NOC had significantly higher % of moderate to high frequency than NOA.

<sup>e</sup>OMA had significantly higher % of moderate to high frequency than NOC and NOA.

<sup>f</sup>AMT had significantly higher % of moderate to high frequency than NOC.

<sup>g</sup>OMA, AMT, CRS, and NOC had significantly higher % of moderate to high frequency than NOA.

<sup>h</sup>OMA had significantly higher % of moderate to high frequency than AMT, CRS, NOC, and NOA.

<sup>i</sup>OMA had significantly lower % of moderate to high frequency than NOC.

<sup>j</sup>OMA, AMT, CRS, and NOC had significantly lower % of moderate to high frequency than NOA.