

Institution: Cardiff Metropolitan University		
Unit of Assessment: UOA32: Art and Design: History, Practice and Theory		
Title of case study: Transforming the life quality of people with advanced dementia – and their carers – with a HUG™		
Period when the underpinning research was undertaken: 2012 - 2018		
Details of staff conducting the underpinning research from the submitting unit:		
Name(s):	Role(s) (e.g. job title):	Period(s) employed by submitting HEI:
Prof Cathy Treadaway	Professor, Cardiff School of Art & Design	Sept 2006 – present
Dr Jac Fennell	Research Fellow, Cardiff School of Art & Design	Sept 2014 – August 2020
Prof Andrew Walters	Professor and PDR Director of Research	July 2000 – present
Aidan Taylor	Research Assistant, Cardiff School of Art & Design	August 2016 - 2020
Period when the claimed impact occurred: 2017 - 2020		
Is this case study continued from a case study submitted in 2014? No		
1. Summary of the impact (indicative maximum 100 words)		
<p>A £424k AHRC-funded research project led by Cardiff Met's School of Art & Design into the therapeutic value of playful objects led to the production of guidelines on designing for people with advanced dementia, with information distributed by both Alzheimer's UK and Care England. It also resulted in the HUG™, an artefact that improves the quality of life of people affected by advanced dementia. A six-month trial funded by £185K from Welsh Government found it improved wellbeing for 87% of participants. As a result, HUG™ is now prescribed on the NHS. Its success has led to significant media attention and the UK Tech4Good Winner of Winners' award 2020. National and international demand from Health Boards, care homes and the general public followed. As a result, a spin-out company was launched in 2020, backed by over £105K investment capital from sources including a Crowd Funding campaign and the UK Alzheimer's Society.</p>		
2. Underpinning research (indicative maximum 500 words)		
<p>The research into wellbeing described here dates from 2012 when Treadaway was co-Investigator on two Arts and Humanities Research Council (AHRC) Connected Communities research projects [a] [b]. This work identified the significance and benefit of creative participatory approaches to design research, and the importance of playfulness, creativity, hand-use and touch to wellbeing. The work also informed subsequent funded dementia design research [c] [d] investigating ways to support wellbeing through playful objects [R1] [R2] [R3].</p>		

In 2015, Treadaway was Principal Investigator and **Walters** was Co-Investigator of the **£424k** AHRC-funded LAUGH project [e], which included funding for a Research Assistant post, filled by **Fennell** (later a Research Fellow). LAUGH involved developing and testing prototype designs for six playful objects (made by Treadaway, **Taylor** and Fennell) for people living with advanced dementia [R4] [R5]. One of its key findings was that *in the moment* experience that is playful and engages the senses is very beneficial to the wellbeing of people living with dementia. Findings also indicated the potential for these six objects to assist in care, support wellbeing, improve mood and positively impact health. One particular object, HUG™ (a long armed, soft cushion-like, wearable object that contains a beating heart and plays music) was found to have a particularly significant impact on the wellbeing of Thelma, the person for whom it was made. Her professional carers contended that the HUG™ **'transformed'** and **'prolonged her life'**.



Significantly, the research also led to the development of a new methodology by Treadaway called 'Compassionate Design' [R4][R5][R6], which highlights sensory stimulation, personalisation and connection with things and other people as fundamental in designing for the wellbeing of people living with advanced dementia. Prior to this development, there had been little specific guidance available to the design industry on addressing the needs of those in the advanced stages of the disease.

In 2018, the team were awarded **£185k** Welsh Government Smart Expertise Funding [f] to conduct a large-scale field trial to evaluate the efficacy of HUG™. Between May 2019 and May 2020, HUGs were evaluated with twenty people with advanced dementia residing in the dementia unit of the *Sunrise Senior Living* residential care home. The details of the results and impact are presented in Section 4 below. A further trial is currently underway in collaboration with Cardiff and Vale University Health Board with twenty NHS hospital patients.

3. References to the research (indicative maximum of six references)

All six of the outputs here are included in our REF 2021 submission, five are published in recognised double-blind peer-reviewed journals [R1] [R2] [R3], [R5] and [R6]. Research grants in the period of **over £800K** including a major AHRC award and **2 design awards** provide further evidence of research quality.

Publications

[R1] **Treadaway, C.** & Kenning, G. (2016) Sensor e-Textiles: Person centered co-design for people with late stage dementia. *Working with Older People Journal*, 20(2), pp. 76-85. DOI: <http://dx.doi.org/10.1108/WWOP-09-2015-0022>

[R2] Kenning, G. and **Treadaway, C.** (2017) Conversations at the edge of play, *Continuum Journal of Media & Cultural Studies*, 31(6), pp. 868-880. DOI: <https://doi.org/10.1080/10304312.2017.1370075>

[R3] Kenning, G. and **Treadaway, C.** (2018) Designing for dementia: Iterative grief and transitional objects, *Design Issues*, 34(1), pp. 42-53. DOI: https://doi.org/10.1162/DESI_a_00475

[R4] **Treadaway, C., Fennell, J., Prytherch, D., Kenning, G. and Walters, A.** (2018) Designing for well-being in late stage dementia, in Coles, R., Costa, S. and Watson, S. (Ed.s), *Pathways to Well-being in design: Examples from the arts, humanities and the built environment*, London: Routledge. ISBN: 9780815346951

[R5] **Treadaway, C., Fennell, J., Taylor A.** and Kenning G. (2019) Designing for playfulness through compassion: Design for advanced dementia, *Design for Health*, 3(1), pp. 27-47. DOI: <https://doi.org/10.1080/24735132.2019.1593295>

[R6] Treadaway, C., Taylor, A. & J. Fennell (2019) Compassionate design for dementia care, *International Journal of Design Creativity and Innovation*, 7(3), pp. 144-157.
DOI: <https://doi.org/10.1080/21650349.2018.1501280>

Funding (total £836,487)

- [a] 2012: AHRC Connected Communities (£40,000) – Permission to Play (University of Strathclyde). Rogerson
- [b] 2012: AHRC Connected Communities (£40,000) – Hidden Connections, Shared Environments and Environmental Flows (Birmingham City University). Prytherch
- [c] 2013: Research Innovation Award (RIA) (£53,000) Cardiff Metropolitan University. Treadaway
- [d] 2015: Cardiff Metropolitan University Funding (£14,000) Sensor e-Textiles. Treadaway
- [e] 2015-2018: AHRC Standard Grant (£424,000) LAUGH: Ludic Artefacts Using Gesture and Haptics. Treadaway
- [f] 2018-2020: Welsh Government Smart Expertise (£185,212)
- [g] 2020: Alzheimer's Society, Business Investment for Spin-Out business (£61,700)
- [h] 2020: Crowd Funding for Spin-Out business (£18,575)

4. Details of the impact (indicative maximum 750 words)

It is estimated that over 900,000 older people in the UK have dementia and this will increase to over 1.2 million by 2030 [E1]. The assumed trajectory of a person with a neurodegenerative disease is reduced activity and limited cognitive response. More specifically, for people with dementia a trajectory of 'no change' over a six-month evaluation period is generally perceived as positive. In contrast, the findings of HUG™ field trials at *Sunrise Senior Living* showed improvement in a range of dementia outcomes: A Bradford Dementia Well-being Profile and Pool Activity Level Instrument was completed at baseline, 3 and 6 months to identify changes in cognitive function and demonstrated that **87%** of residents using a HUG™ for six months experienced an **improvement in their wellbeing** and some increased **functional and cognitive ability** [E2]. These findings were further supported by qualitative feedback gained from interviews with the family members and care staff of people involved in the trial:

Dementia Nurse Consultant DUETcare:

"HUG can provide comfort and wellbeing to people living with advanced dementia and offers a way of reconnecting with loved ones when words are often hard to communicate."

Reminiscence Co-ordinator, Sunrise Senior Living:

"Using the HUG has been an effective way of helping our residents feel secure and loved, it has been amazing to see the smiles that a HUG can bring."

A daughter on her mother's response to HUG:

"She finds it very comforting. I'm not sure what her perception is. I know she talks to it, and she kisses the head and she strokes it ... she absolutely loves it. Honestly when I saw her with it the first time, I cried, cos she was getting so much comfort from it and I just can't praise it enough"

In October 2019, the BBC produced a short film [E3] about HUG™, featuring an interview with someone living with dementia and her daughter. The daughter stated:

"The thought of your loved one kind of slipping away and maybe just slipping away for good is just terrifying. So to see her actually coming back is just amazing. It's just brilliant.... The HUG, I don't know what it is, but it has kind of brought her (Mum) back again. The recognition, the smiles, the happiness seems to have come back."

Three days after broadcast the film had gained **178,260 'likes'** on Facebook and **410 'shares'**, while **26 health boards** and **44 care homes** had asked to purchase the HUG™. There were also **74 enquiries** from the public, with requests from as far afield as The Netherlands, Iceland, South Africa, Belgium, France, Canada, Singapore and Australia. An additional **22** requests for more information were received from people living with other medical and behavioural conditions affecting people of all ages, such as autism, chronic fatigue and depression.

In March 2020, interest in HUG™ led to a spin-out company (HUG by LAUGH) [E4] being set up to manufacture and sell HUG™, creating **three new jobs**. Investment capital of **£105,275** was raised from three sources: **Alzheimer's Society UK** contributed £61,700 through their Accelerator Programme [g] which 'invests in innovations to improve the lives of people affected by dementia', a **Crowd Funding** campaign raised £18,575 from 196 supporters [E5], and **Cardiff Met** invested £25,000. One of the Accelerator Award judges commented: *"This sweet, simple and effective product touches the heart, very tactile and believable. What greater feeling is there than receiving a hug?"*

HUG™ is now being **prescribed on the NHS** to people living with cognitive impairment. In September 2020, the research team won both the **People's Award** and the **'Winner of Winners' award** at the **UK Tech4Good Awards** [E6].

A Compassionate Design methodology book providing guidelines on designing for the wellbeing of people living with advanced dementia was launched in March 2018 at the Royal Society of Arts in London and information on it was distributed by both the **Alzheimer's Society UK** [E7][E8] and **Care England**. As a result, LAUGH research is included on the Social Care Institute for Excellence website [E9] as an **example of good practice** for the care industry. The methodology is also taught to design and Human Computer Interaction students at Cardiff Met, Swansea University, the University of the West of England, and the University of Technology Sydney.

In summary, Treadaway's team's research has had significant impact on the quality of life of older people living with advanced dementia and care practice. It has raised dementia awareness and provided guidelines for the design industry on how to address the needs of people living with advanced dementia. A spin-out business has made the HUG™ available, nationally and internationally.

5. Sources to corroborate the impact (indicative maximum of 10 references)

- [E1] Wittenberg R, Hu B, Barraza-Araiza L, Rehill A. (2019) *Projections of Older People with Dementia and Costs of Dementia Care in the United Kingdom, 2019-2040*. London, England: Care Policy and Evaluation Centre, pp. 1-79, highlighting the number of people in the UK with dementia https://www.alzheimers.org.uk/sites/default/files/2019-11/cpec_report_november_2019.pdf
- [E2] Treadaway, C., Pool, J. and Johnson, A. (2020) Sometimes a HUG is all you need, *Journal of Dementia Care*, November/December, 28(6), pp. 32-34, providing evidence of research findings that the HUG improved wellbeing for 87% of participants..
- [E3] BBC Film: <https://www.bbc.co.uk/news/uk-wales-50237366> , showing how the HUG is used as well as reflections of its impact from interviewees.
- [E4] Spin-out company website: <https://hug.world/>, highlighting that a spin-out company has been formed.
- [E5] Crowd Funding: <https://www.crowdfunder.co.uk/hug-by-laugh-1>, confirming that funding has been raised through crowd funding.

- [E6] UK Tech4Good Awards: <https://www.tech4goodawards.com/2020/winners-revealed/>, confirming that the HUG won the Tech4Good People's award.
- [E7] Dementia Knowledge Centre (DKC) E-Bulletin – confirming evidence of dissemination of the Compassionate Design methodology to Alzheimer's Society members.
- [E8] Email from Knowledge Officer, Alzheimer's Society confirming distribution of Compassionate Design methodology to Alzheimer's Society members.
- [E9] Research recognised, recommended and disseminated to the public on the Social Care Institute for Excellence website:
 - a. <https://www.scie.org.uk/prevention/research-practice/getdetailedresultbyid?id=a110f00000NXsByAAL>, confirming the LAUGH research is included on the Social Care Institute for Excellence website.