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Published in:
Social Science & Medicine

DOI:
10.1016/j.socscimed.2023.116099

Publication date:
2023

Social Science & Medicine 331 (2023) 116099

Contents lists available at ScienceDirect

Social Science & Medicine

journal homepage: www.elsevier.com/locate/socscimed

Care and rhythmanalysis: Using metastability to understand the routines of dementia care

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ARTICLE INFO

Handling Editor: Susan J. Elliott

Keywords:
Dementia
Caregiving
Metastability
Rhythmanalysis
Eurhythmia
Rhythms

ABSTRACT

An increasing number of people living with dementia worldwide receive informal care from their family members. A key element of dementia care is maintaining a daily routine and familiarity, making caring an extremely rhythmic practice. To explore the rhythmic nature of informal care, we apply and advance Lefebvre's unfinished rhythmanalysis by developing an original typology of eurhythmia as a metastable equilibrium. Metastability, although appearing macroscopically stable, is a vulnerable state where a slight disturbance can result in deviation to another state (i.e., stable or unstable). Drawing upon interviews with informal caregivers, we discuss the rhythms and (dis)harmonies of caring practice, including the substantial rhythms of caring practice, the relational balance of rhythms between the caregiver and care recipient, and the various rhythmic disruptions that occur. We demonstrate how metastability provides an understanding of the ever-changing rhythms of every day and allows us to move beyond the immediacy of arrhythmic breaks and explore the subtle changes that occur in (poly)rhythms. Thus, eurhythmia as a metastable equilibrium allows us to explore the gradual and subtle development of, and changes to, dementia care and other routine practices in health geography.

1. Introduction

An increasing number of people living with dementia worldwide receive informal care from their family members (Mittleman and Batsch, 2012). While it is generally recognised that partners and friends of people living with dementia should have a choice in whether to provide care or not, as well as the types of care they provide (Al-Janabi et al., 2018), the increasing demand for dementia care combined with the unsustainable formal care system and continuing austerity measures across the UK, means that informal caring is likely to be the case for many within and beyond the UK (Pertl et al., 2019). Looking after someone with dementia is often very challenging and stressful, with a critical element being maintaining a daily routine and familiarity (Botek, 2021; Redfern et al., 2002); making caring an extremely rhythmic practice (Pazhoothundathil and Bailey, 2021). Consequently, rhythmic disturbances, phenomena that cause breaks in the routine/rhythm, pose a major difficulty for caregivers and care recipients and can cause a decline in quality of life, increased distress, and even institutionalisation (Safi and Hodgson, 2014).

To explore the rhythmic nature of informal care, we refine Lefebvre's (2004) unfinished rhythmanalysis. Whilst 'the meanings of the term [rhythm] remain obscure' (ibid, 2004, p.15), Lefebvre's conceptualisation of rhythm in an entanglement of repetition and difference: rhythms are repeated actions, yet "there is no identical absolute repetition indefinitely" (ibid, 2004, p.6). Rhythms are ubiquitous and diverse and include the cyclical repetitions of cosmological (e.g., day and night) and circadian rhythms (e.g., sleep patterns) and the linear repetitions of social and human activities (e.g., timetables and opening hours). The diversity of these every day "rhythms are forever crossing and recrossing, [and] superimposing themselves upon each other" (Lefebvre, 1992, p. 205). These rhythmic coalescences, or polyrhythmia, are filled with various rhythms that interact in complex ways, sometimes harmoniously co-existing (eurhythmia) or dissonant and conflicting (arrhythmia). Despite the popularity of rhythmanalysis in the social sciences, eurhythmia is often overlooked for intriguing discussions on and applications of arrhythmia (e.g., Edensor, 2010; Jones and Warren, 2016). Additionally, there has been a limited engagement with Lefebvrian theory in health geography despite the evidence that routines that support health/well-being are embedded within space-time contexts (Marković, 2019; McQuoid et al., 2017).

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https://doi.org/10.1016/j.socscimed.2023.116099
Received 6 February 2023; Received in revised form 27 June 2023; Accepted 14 July 2023
Available online 17 July 2023

As a "floating harmony" (Evans and Franklin, 2010, p. 183), eurhythmia is often considered an optimum polyrhythmic assemblage precisely because of its apparent congenial qualities. This paper, however, questions this common understanding and develops an original conceptualisation of eurhythmia as a metastable equilibrium. The consideration of metastability, as a state of apparent equilibrium but in constant collapse and reformation, allows for refinement and advancement of Lefebvrian theory. Thus, metastability does not imply that rhythms are perfectly stable, but rather there is a dynamic balance between competing forces that allow them to persist over time (Simondon, 2009). By exploring metastability in informal caregiving rhythms, we detail how eurhythmia may macroscopically appear 'manageable' or stable, but there are gradual changes that happen to this rhythmic 'stability'. Therefore, this paper extends scholarship on rhythmanalysis and the geographies of care in two significant ways: it develops and applies a typology of eurhythmia as a metastable equilibrium and, in doing so, explores the intricacies in the eurhythmia of informal caregiving and develops a conceptual toolkit for exploring the sporadic yet routine nature of dementia lifeworlds.

2. Eurhythmia: metastable equilibrium

In his last but unfinished work, *Rhythmanalysis* (2004),[1] Lefebvre (and co-author Catherine Régulier) discuss the presence and impact of the rhythmic society. These essays build upon Lefebvre's previous works (1991, 1992) and combine the biological, spatial, temporal, and political into a holistic concept of society and everyday life. Despite not determining how to undertake rhythmanalysis, Lefebvre proposes a conceptual framework for analysing spatial and temporal phenomena interlocking. Following the translation of *Rhythmanalysis* (2004), there has been a strong interest in analysing everyday rhythms within anglophone geographical scholarship, demonstrating the interconnectedness of different temporalities in everyday life. These studies have highlighted how a study of society's rhythms brings a renewed richness to questions of power (Jones and Warren, 2016; Reid-Musson, 2018), mobilities (Cook, 2022; Rickly, 2017), the more-than-human (Marković, 2019; Walker et al., 2020), and health and well-being (McQuoid et al., 2017; Vallée, 2017).

A key element of Lefebvre and Régulier's work is the coalescence of rhythms across levels and scales. This co-existence and interrelation of rhythms, or polyrhythmia, are complex and dynamic assemblages (Chen, 2017) and perfectly exemplified by the body: "The body consists of a bundle of rhythms, different but in tune. […] The body produces a garland of rhythms, one could say a bouquet" (Lefebvre, 2004, p. 20). While Lefebvre's conceptualisations of polyrhythmia focus on the body (albeit often as a metaphor for society), they are also embodied by other spatial fabrics (e.g., the city) (Edensor, 2010; Lefebvre, 2004). The versatility and applicability of the concept are apparent in various work which has explored smoking (Marković, 2019), urban air pollution (Walker et al., 2020), and the creative economy (Jones and Warren, 2016). This work demonstrates how polyrhythmia captures the co-existence and interrelation of rhythms "without revealing any simple or linear relationships of causation" (Marković, 2019, p. 495). However, this co-existence and interrelation can be typified further as either an arrhythmia or, as the focus of this paper: a eurhythmia.

Eurhythmia is a polyrhythm where the various rhythms support, collaborate, and mutually reinforce each other. For example, Lager et al. (2016) likens older adults' well-being experiences in their urban neighbourhoods to a eurhythmia since they find comfort and safety in the regularities and behavioural repetitions occurring in their neighbourhoods. Indeed, everyday life often embodies eurhythmic ordering due to the routine qualities of place, with each location having its own 'place-ballet' constituted by people's time-space patterns. Thus, eurhythmia is often described in the literature as a harmonious and stable manifestation (Evans and Franklin, 2010; Meij et al., 2021). Yet, eurhythmia is more complex than just a harmonious polyrhythm; it may be an ideal polyrhythmia, but it is constantly changing and adapting.

Whilst Lefebvre (2004, p. 30) equates a eurhythmia to a "*metastable* equilibrium", the notion of metastability is seldom discussed in the social sciences. Instead, it is a commonly used concept applied in physics, chemistry, and neuroscience (e.g., Bardin and Ferrari, 2022; Kelso, 2012; Reiter and de Gennes, 2001)[2] yet is a valuable concept through which to reflect on caregiving practices. Metastability is a precarious state of constant collapse and reformation but appears macroscopically stable. For example, Kibele et al. (2015) illustrate the stability states with podiatric movement (Fig. 1), demonstrating how running, as the continuous state of falling and recovering, exemplifies metastability whereby having constant foot-ground contact will coax a stable state. However, a strong disturbance to the running rhythm may prompt falling or an unstable state. A metastable equilibrium is vulnerable and can quickly become stable or unstable when subject to an external disturbance or arrhythmia. Yet, as soon as the disruption is rectified or removed, the polyrhythmia will return to the initial metastable state. However, if subjected to a sufficiently strong disturbance, the situation will transition into a new equilibrium, whether that is (un)stable or another metastable equilibrium (Tschoegl, 2000). Since eurhythmia is often described as harmonious, it is essential to highlight that the distinction between stable and metastable is generally that a stable state is 'truly unchanging', whereas the metastable state may change slowly or gradually (Anderson, 2002).

A metastable equilibrium, therefore, goes together with disruption and change. Indeed, Kibele et al. (2015) argue that one of the theoretical strengths of metastability is its ability to explore transfers and conditions of flux resulting from these disruptions or arrhythmic moments. Arrhythmia represents the de-synchronisation or breakage in rhythms. The term commonly refers to an irregular heartbeat and, in its philosophical understanding, is a similar discordance of interruption and disharmony where "rhythms break apart, alter and bypass synchronisation" (Lefebvre, 2004, p. 77). Thus, arrhythmia interrupts eurythmic configurations with pathological and damaging consequences. Predominantly arrhythmia is equivalent to a pathological disorder but can also embody potential. It can also be curative and restorative, whereby rhythmic breaks and interventions can spur potential and productive change in the rhythms in the aftermath (Simpson, 2008).

By understanding eurhythmia as a metastable equilibrium, it evolves into ever-changing and vulnerable polyrhythm rather than a simplistic harmony of rhythms. As a stable instability, a eurhythmia is neither a perfect nor unworkable state but a viable middle ground with the macroscopic illusion of stability despite being in constant flux. Lefebvre (2004, p. 20) contextualises eurhythmia as the healthy human body – "a bundle of rhythms, different but in tune" – and this aligns with the metastable typology since the body is ever-changing with new aches and pains. So, whilst the body may appear stable, the growing stresses of everyday life and the processes of ageing epitomise the gradual changes that occur in a eurhythmia. Indeed, the frailty and fragility of later life can remind us of the universal vulnerability of our bodies and relationships, especially with the growing prevalence of degenerative diseases and the need for social care.

3. The rhythms in the geographies of care

Caring is a broad term referring to a proactive interest of one person in the well-being of another (Conradson, 2003). Care is an ethics of

[1] *Rhythmanalysis: Space, Time and Everyday Life* is a collection of pieces including the unfinished 'Elements of Rhythmanalysis' (Lefebvre, 2004), and two co-authored essays with Catherine Régulier.

[2] Simondon (2009) was one of the first philosophers to expand of the philosophy of metastability in discussions on individuation.

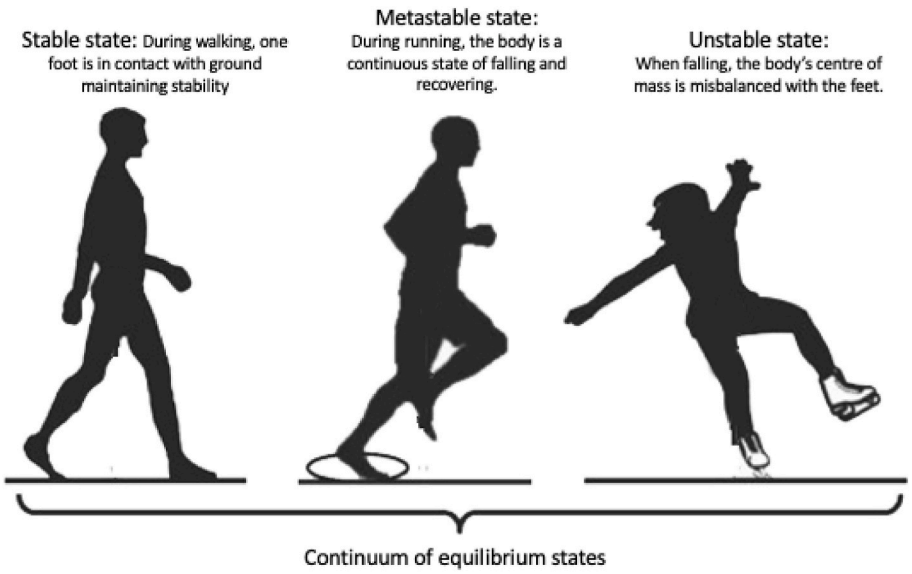

Fig. 1. The continuum of equilibrium states depicted as podiatric movements (after Kibele et al., 2015, p. 886).

encounter, a set of practices "to maintain, continue and repair our "world so that we can live in it as well as possible" (Fisher and Tronto, 1990, p. 40). It is important to stress that care practices are multidirectional (Gorman, 2019), whereby the caregiver's "own sense of health and well-being is intimately bound up with the health and well-being of the care recipient" (Milligan, 2006, p. 326) and there is a rich diversity of caring relationships including childcare (Lulle and Kaleja, 2021), animal welfare and care (Gorman, 2019), care among colleagues (Askins and Blazek, 2017) and of ourselves (Asker, 2022).

Despite the breadth of contributions to the study of care in the social sciences, our focus is on the informal care of those experiencing memory loss or dementia. Dementia is a long-term condition where the individual can progressively and gradually lose cognitive functions, including memory, behaviour, and language (Lipton and Marshall, 2013). Thus, those with dementia become increasingly dependent on others for everyday activities, with the caregivers gradually adapting to the needs of their care recipient. This dependence can be especially hard for informal caregivers, who provide unpaid care to their relatives or friends (Bremer et al., 2015). With the prevalence of dementia likely to triple worldwide by 2050 (GBD Dementia Forecasting Collaborators, 2022), informal caregivers will become even more essential to health and social care provision worldwide, especially with the '*Ageing in Place*' policy agenda.

Due to the growing societal significance of (informal) care, many health geographers have provided crucial contributions to the study of care from a range of discourses and perspectives (e.g., Conradson, 2003; Milligan, 2017), demonstrating how care is emotional, relational, embodied, and contextualised across space and time. Indeed, the work on caringscapes/carespaces (Bowlby, 2012; Bowlby and McKie, 2019; Ivanova et al., 2016) stresses the importance of both time and space in care and caring relationships and calls for explorations of "the various temporal rhythms and routines of care" (Milligan and Wiles, 2010, p. 740).

Thus, rhythms are a fundamental aspect of the geographies of care and are further demonstrated by the dominance of 'routine' within health literature (Denham, 2003; McQuoid et al., 2017; Zisberg et al., 2007). 'Routine', 'habits', and 'rituals' are widely regarded in nursing and health sociology literature as crucial for advancing and maintaining health and wellbeing. For example, Wiles (2003), in their discussion of the experiences of informal caregivers, stressed the importance of routine, with the caregivers describing their daily routines in striking detail. Some suggested that the establishment and maintenance of caring routines maintain a structure for the care recipient, whereas others indicated that it was a tactic for the caregivers to help them cope with the sheer volume and intensity of care-related tasks (Wiles, 2003).

In a recent special issue in *Applied Mobilities,* authors have begun to unpack and explore caring practice through a Lefebvrian lens to explore 'rhythms of responsibility' (Lulle and Kaleja, 2021) and 'the extraordinary in the ordinary' (Fitzpatrick, 2021) of childcare and care home workers respectively. Fitzpatrick (2021) unpacks the spatiotemporal dimensions of care work and identifies the pressure of satisfying the rhythms of the work; Lulle and Kaleja (2021) focus more on the temporal and personal rhythms in informal and formal childcare. Their analysis of the emotional labour of mothers and childcare providers in Latvia demonstrates how rhythms are substantial and relational; they exist because of the relations between actors, things, and processes. While consideration of the interconnected rhythms of the practice of care (the substantial) and the relational rhythms are key tenets of caregiving rhythmanalysis, it is paramount to explore the continual disruptions and transformations that occur in care provision (Karner and Bobbitt-Zeher, 2006).

Despite this stressed importance of routine in the geographies of care, it is often described as "sporadic and inconsistent" (Zisberg et al., 2007, p. 443), leaving space for further discussion on how and why these rhythms that support well-being and health are formed, disrupted, and displaced, whilst considering the dynamic space-time contexts of people's everyday lives and the logistical and rhythmic forces that shape them. Therefore, by applying Lefebvrian rhythmanalysis to dementia care, this paper addresses two critical gaps: (1) it develops a typology of eurhythmia that can explore the gradual rhythmic changes over sudden breaks, and (2) it develops a conceptual toolkit for discussing the establishment, maintenance, and disruptions in the routine nature of dementia lifeworlds and other carescapes.

4. Methodology

This paper is underpinned by the experiences and narratives of caregivers across the UK and is part of a much larger project looking at the links between mobility and well-being in later life. The Meaningful Mobility project focuses on the experiences and patterns of everyday mobility of older adults in three different socio-economic contexts. Within Meaningful Mobility, we have explored older adults' mobility practices and routines of their daily activities, thereby generating a deeper understanding of their experiences and feeding directly into

discussions around rhythmanalysis. Additionally, the criticality of maintaining routine in caring practice (Botek, 2021; Redfern et al., 2002) further emphasised the significance and presence of rhythms in older adults' lives.

4.1. Participants and recruitment

A gatekeeper approach was utilised to recruit participants through organisations and groups. TL liaised with gatekeepers, such as coffee morning organisers, charity organisations, and care support groups across the UK to promote the research. Through this recruitment process, 17 caregivers volunteered to take part (Table 1), all of whom were 50 years or older and caring for someone with some memory problems or dementia. Whilst gender or familial relationship was not explicitly recruited for, most carers were spouses or daughters.[3]

4.2. Data collection

The semi-structured interviews, undertaken between January and August 2021 by TL, explored the caregiver's everyday experiences and mobilities and the roles supportive actors play in their caregiving, such as other family members, caregiver supports, and medical professionals (Lowe et al., 2023). Due to the COVID-19 pandemic, all these interviews were undertaken remotely, which allowed us to speak with more geographically dispersed participants yet have the same qualitative rigour as in-person interviews (Holt, 2010; Malta, 2012). The interviews were audio recorded rather than video recorded. This avoided the potential privacy risks of video calls and utilised the familiarity of telephone communication. Furthermore, the framing of the interview around three time periods -past/before caring, present, and future (Lowe et al., 2023) offers a way of reflectively engaging with rhythm by offering participants an opportunity to take a 'present-but-outside perspective' (Bennett, 2015, p.960–1). Such a perspective is crucial to explore rhythm and rupture as a result and consequence of informal care responsibilities during the pandemic (Lyon and Coleman, 2023). The interviews, which were on average 70 min in length, were recorded and later transcribed verbatim.

Table 1
Participant characteristics.

Name (Pseudonymised)	Age	Gender	Relationship to caree
Mrs Jones	60	Female	Daughter-mother
Ms Bradley	54	Female	Daughter-mother
Mrs Smith	67	Female	Wife-husband
Mr Mitchell	71	Male	Husband-wife
Mrs Woods	66	Female	Wife-husband
Mrs Chapman	64	Female	Wife-husband
Mrs Law	63	Female	Daughter-mother
Mrs Christie	65	Female	Wife-husband
Ms Graham	57	Female	Daughter-father
Mrs Peel	57	Female	Daughter-mother
Mr Andrews	Mid-80s	Male	Husband-wife
Mr Philips	63	Male	Husband-wife & mother in law
Mr White	72	Male	Self-care
Ms Collins	59	Female	Daughter-mother
Mrs Wilkinson	52	Female	Wife-husband
Mrs Wilson	Not disclosed	Female	Wife-husband
Mr Osman	62	Male	Husband-wife

[3] We are unable to provide the details of the race and ethnicity identities the caregivers. This is because we used a convenience sampling strategy that was necessary due to the difficulties of recruiting participants both remotely and during the COVID-19 pandemic. Our main focus during participant recruitment was age and gender because care is considered a highly gendered sphere and carers for older adults living with dementia are often older adults themselves.

4.3. Analysis

The interview transcripts were coded and analysed thematically by TO: a coding structure was developed from themes grounded in theory around well-being, mobilities, and rhythms, as well as the subjects that emerged from the data. This approach was reflective, with the inductive codes applied to all the transcripts and overlapping deductive codes combined to complement the initial grounded themes of rhythmic disruptions and substantial and relational rhythms.

4.4. Research ethics

The data were collected and stored securely in line with the General Data Protection Regulation (GDPR) (Meijering et al., 2020), and ethical clearance was granted by the University of Groningen and the European Research Council.

5. The eurhythmias of informal care

5.1. Routines and circadian rhythms

With the progressive need to support the care recipient in activities of daily living, maintaining a routine is fundamental since it can benefit both the caregiver and the care recipient (Porock et al., 2015). Indeed, many caregivers highlighted the importance of a daily routine in their caring practice: "*I have to follow the same routine every day for my mother, so that's she able to engage with it. You can't really alter routines significantly when you're dealing with someone with dementia*" (Ms Bradley). As Ms Bradley demonstrates, by maintaining a routine, the care recipient (her mother) can be an active actor within the rhythms of the house, like grocery shopping, the laundry, and walking the dog (e.g., Mrs Wilson, Mrs Christie, and Mr Andrews, respectively). Not only does a routine encourage purposeful activity, but it also helps the care recipient tackle some of the challenges of short-term memory loss with familiarity since habits and memories often fade away last (Botek, 2021): "*she's (care recipient) losing her confidence as she's getting more forgetful. And she likes her routines because of it*" (Mrs Peel).

The organised rhythms of caregiving are also beneficial to the caregivers. The caregivers caring for those in the mild or earlier stages of the disease explained that the routine meant that less supervision and direct action was needed and that they were able to leave their care recipient for a few hours at a time: "*He's absolutely fine, I can go out for a couple of hours knowing that I've sorted out before I've gone*" (Mrs Chapman). Since the care recipient can act within the caregiving rhythms independently, these routines can also reduce the stress and burden for the caregiver (Botek, 2021). However, it is important to note that all the caregivers commented that their loved one is always on their mind, even if they found time for themselves. Crucially, from the dominance of a routine, the caregiver can quickly notice and adapt to any changes in the care recipient's condition to the extent that "*with each new thing [disruption], it becomes ordinary quickly*" (Mr Mitchell).

These routines were often underpinned by the care recipient's natural circadian rhythms, which strongly echoes Lefebvrian theory - rhythmanalysis is fundamentally embodied: 'to listen to one's own body is necessary to appreciate external rhythms' (Lefebvre, 2004, p.19). Many caregivers detailed that they gave their care recipient meals and put (or nudged) the care recipient to bed and woke them each day: "*Because of the situation, we wake [care recipient] up, and we talk her to bed. She doesn't live with us. We talk her to bed every day, and it would have been eight, ten phone calls throughout to nudge her*" (Mr Philips). Whilst the body is central to rhythms, Lefebvre's interest in the body is founded on a conception of practice that is complex, open-ended, and holding many dimensions: "in the body and around it … rhythms are forever crossing

and recrossing, superimposing themselves upon each other" (Lefebvre, 1991, p.205; Simonsen, 2005). While the body is central across Lefebvre's work (1991, 1992, 2004), he argues that external capitalist systems dominate the body's natural circadian rhythms and that the body is trained by external rhythms through the process of dressage (Jones and Warren, 2016; Massey, 2019). However, in dementia care, the body's circadian rhythms take precedence instead, broadly resisting dressage - with the only exception being for medical appointments. Whilst the increasing need for informal care globally may arise from capitalist structures (Healy, 2008), the often-dominating rhythms of capitalism cannot entirely override the rhythms of caregiving: the needs of the body prevail.

However, due to the degenerative nature of the disease, the circadian rhythms that dominate the routines and rhythms of caregiving are constantly shifting. For instance, the caregivers reported that their sleeping patterns and those of their care recipient had gradually changed during the progression of the disease. Indeed, as dementia progresses, there can be an increase in sleep disturbances (nightmares and night terrors), the possibility of restless leg syndrome, and incontinence (Gibson et al., 2014). These disturbances in the sleep cycle can have knock-on effects for the care recipient and caregiver due to an increased chance of the care recipient sleeping in, missing meals, and daytime napping (which in turn affects the sleep cycle again). Thus, the rhythms of caregiving are never certain but continually shift depending on the body's needs. Indeed, as a degenerative disease, the very nature of dementia means that the dominant circadian rhythms are metastable; they are constantly shifting across different lengths of time based on the care recipients' (often increasing) needs.

5.2. Between the caregiver and care recipient

A relationship underpins the practice of caregiving. However, the informal caregiver-to-recipient relationship is complicated by the layering, or intermingling, of several relationships with different needs, power dynamics, and histories (LaPierre and Keating, 2012). Informal caregivers are often related to those they care for; thus, they balance the marital or parent-child relationship with the caregiver role. Most of the caregivers in our study informally cared for either their spouse (eight) or a parent (six), with some reflecting that caring is just a part of the relationship: "*I think caring is different when it's your husband because you care for them anyway*" (Mrs Wilson). However, after the diagnosis, many of the caregivers reflected upon how the relationship between the couple's needs becomes disharmonious and the care recipient takes priority: "*That's how I feel as a carer. Nobody cares about you. He's [care recipient] the most important thing, he's the one we have to concentrate on. He's the one that everything is aimed at*" (Mrs Smith). For some, like Mrs Smith, this tension between affection and resentment can tip either way, depending on the day-to-day rhythms of the caregiving. For instance, bouts of aggression or frustration from the care recipient can add to the emotional burden of caregiving and move closer to an arrhythmic relational rhythm or increase feelings of guilt (Prunty and Foli, 2019).

Undeniably, dementia can significantly affect the personalities of those living with it, whether that is the loss of abilities or the development of new personality traits (Quinn et al., 2015). While many caregivers stressed that these changes developed gradually, they had to adapt to the 'new person' or, as Mrs Woods describes, '*grieve for someone twice*' due to the loss of the person they remember. These changes to the care recipient's personality (and therefore the caregiver's and care recipient's relationship) are not static nor do they follow a single trajectory. As an unusual example,[4] Mrs Wilkinson found caring for her husband stressful and anxiety-provoking since he would complain, ask questions repeatedly, and get angry at her. This situation grew too much for Mrs Wilkinson, and Mr Wilkinson moved into residential care for five years, where she visited every day before returning to the family home this year. She commented that she could care for him in the home because:

> "*He's probably in the most chilled phase that he's ever been in his life. (…) he's in the latter stage of dementia, at home and knows that he's well looked after; it's calm and peaceful here. He laughs quite a lot these days, which is lovely. It's just such a change from all the years of angst.*"

Thus, the relational rhythms between the caregiver and care recipient do not follow a single fixed trajectory but shift between different metastable states. Indeed, Quinn et al. (2015) highlight that the relationship is not static, and there are often moments where the 'old self' and previous relationship reappear (and disappear again). Mrs Wilson explained that when her husband spoke about his previous employment or topics he knew very well, it was like she was not living with someone with dementia but the man she knew previously. These changes in the relationship between caregiver and care recipient typify the metastable nature of caregiving; there are moments of slow and gradual change, such as Mr Wilkinson's change during his residential care and many other caregivers who reflected on their care recipient's gradual changes, but also fleeting moments where it can return to a previous relational state (i.e., Mrs Wilson). Indeed, the rhythms of the relationship may alter, but the relationship is constant.

5.3. Relational polyrhythms and networks

The relational rhythms of caring are not always bilateral but are better described as a network of care with other family members (i.e., children, siblings), friends and neighbourhoods, or formal/paid caregivers assisting in the caregiving practice. These networks of care have a crucial role in promoting caregiver well-being and avoiding burnout (Forbes et al., 2011); for example: "*My family who are always giving me a big hand - I don't know how we would have coped without them*" (Mr Mitchell). These family members, who did not live with the caregiver and care recipient, incorporate themselves into the caring rhythms and routine by visiting at the same time and day each week; for example, Ms Collins detailed that she goes to visit her parents from 10am to 5pm most days, and her sister will be there every Monday from 11am to 2pm. While these visits were frequent and scheduled (for the most part), visits from family and close friends were often seen as a 'change of pace' from the mundanity of the substantial and circadian rhythms. Thus, joining rhythms allows more evaluation (and/or appreciation) of the original rhythm. Indeed, Lefebvre (2004, p. 10) argues that "we know that a rhythm is slow or lively only in relation to other rhythms".

Although the familial relational rhythms were seen as a major positive for most caregivers, each caregiver had a story about where another relational rhythm dissolved, whether with friends or other family members. A common occurrence was the loss of friends: "*Our friends just slowly disappeared. We couldn't keep up with them, and it was difficult going out with them … he [care recipient] couldn't cope with a restaurant and stuff like that*" (Mrs Woods). Mrs Wood's account of their disconnect with old friends epitomises a moment when "rhythms break apart, alter and bypass synchronisation" (Lefebvre, 2004, p. 67). Thus, some relational rhythms can be arrhythmic, indicating that the disease was a factor in the shift from the relational rhythm's metastable state to an unstable one. Despite the emergence of arrhythmic relational flows, there were also instances where the relationships adapted to the person's needs with the diagnosis. For example, before his diagnosis, Mr White had a group of friends linked with his support of his local football team, but many drifted away since he often lost his temper with them. Two friends, however, stood by him by educating themselves on the condition, thus shifting their friendship from 'football buddies' to incorporating more social support. These shifts in the relational rhythms (gradual or sudden) were common among the participants, again attesting to the metastable nature of caregiving. While Mr White's friends may not be 'official'

[4] Mrs Wilkinson's experience is unusual since the transition from the home to residential care-home setting is often the last residency for the care-recipient.

caregivers, the relationship shifted gradually from social company and fun with the addition of rhythms of support and care.

While these familial relational rhythms may be complex in their intermingling due to the histories of the relationships, the merging of rhythms is more complex when professional caregivers are employed since they are external to the familial relational rhythms and often are subject to tight time pressures. Indeed, Ms Woods described how the professional carers who support her neighbour visited the neighbour for 5 min each day and had "*no time to build a relationship*". Yet many of the caregivers discussed how professional carers had become an integral part of their everyday lives:

> "*I am really lucky in that I have carers go in four times a day now. So they go in the morning, get him up, make him breakfast, and wash and dress him. They go back about 1pm and just have a brew with him and a game of dominoes. Then they're back at teatime, and at bedtime. I have some good carers; it's not like an agency where they just send different people all the time. You never know who's going and, well, that's no good for people with dementia because they need to know who they are*" (Ms Graham).

Ms Graham's account reemphasises the importance of circadian rhythms in caregiving and how new rhythms are forged between the family and the formal caregivers. The caregivers' working routines merge with the circadian rhythms of the care recipient, and the caregiver is given a bit of respite during the moments of formal care and has time independent of the caregiving routines. So, while the metastable state of caregiving shifts the routines and rhythms of the individual actors, the relational polyrhythmia that occurs with the merging of the individual's rhythms is an exemplar of "finding a balance point [to] preserve equilibrium in caregiving while facing competing needs" of the various actors (Shyu, 2000, p. 36).

5.4. Shifts and disruptions

Aside from the substantial and relational rhythms, caregiving further exemplifies the metastable nature of eurhythmia through its vulnerability to change. Indeed, in the previous discussions of substantial and relational rhythms, there were examples of how these rhythms are in continual flux, whether gradual or sudden. Caregiving practices are "fragile synchronicities" (Fitzpatrick, 2021, p. 120) with the degenerative nature of dementia and major events that occur in later life. For example, six caregivers reflected upon specific events, such as falls or a stroke, that spurred a sudden change in their caring practice:

> "*It just seems to be everything goes okay, and then all of a sudden something'll happen. I mean, he fell one night [and] he'd broke his wrist. After the carer found him on the floor, I had to up his care*" (Ms Graham).

Events like these spur changes in the rhythms of caregiving with changes in caring time and the space(s) of care (Lowe et al., 2023). Numerous couples arranged their houses, added more assistive tools (such as stair rails), and even in a couple of cases, moved home to make their caregiving practice easier. Thus, disruptions can change the spatialities of the caregiving rhythms, often at a smaller scale.

The data that underpins this paper was collected amid the COVID-19 pandemic. During this time, people were only allowed to mix outside in groups of six (or two households), and this was eased more as the UK Government's '*Roadmap out of Lockdown*' (2021) progressed. Consequently, all the caregivers reflected upon how the restrictions impact their and the care recipient's everyday lives. Whilst the substantial circadian rhythms were broadly unaffected by the pandemic's restrictions since those rhythms are centred on the home space(s): "*She's had the same kind of routine which she likes*" (Mrs Peel). However, the pandemic has major effects on the relational rhythms of caregiving with the closures of dementia support groups and the impossibility of having other family members in the home, which can have major effects on the caregiver and recipient's well-being:

> "*I can probably count the fingers of one hand when we've seen somebody, and that's actually visited us. I'm aware that they can't, well, they are not allowed in, but it's just like suddenly everyone forgot us. We don't exist anymore*" (Mrs Smith).

And whilst the relational networks may have been reduced or dissolved because of the pandemic, many caregivers reported that their relationship between caregiver and care recipient grew much stronger. Thus, similar to life events, the pandemic reduced the scale of the rhythms of caring from the community and extended family spaces to the home. Indeed, we have shown how older adults have adapted and overcome many mundane obstacles caused by the pandemic, with the smaller spaces of the home and local neighbourhood becoming crucial (Osborne et al., 2021; Osborne and Meijering, 2023). Thus, with the emphasis on circadian rhythms in caregiving, the pandemic was often described as another readjustment in the caregiving practice but had major implications on the caregivers' well-being since it has been "*twice as hard to be able to kind of relax or do normal stuff that would make it easier*" (Mrs Peel).

Beyond the pandemic, another common disruption to caregiving eurhythmias is the involvement of professional carers and respite care. As a support service provided in or outside the home, respite care aims to give the informal caregiver temporary relief or a break from caregiving duties. For example:

> "*I did get a couple of weeks respite back in April where she [care recipient] was in a home for two weeks, and that sort of recharged me up, and I've not been as bad since then I used to get riled up* […] *I felt dead guilty putting her in there, but after few hours I was relaxed*" (Mr Osman).

The organised disruption of respite care is akin to Simpson's (2008, 2012) work on street performance and the disruptive potential of disruptions (or arrhythmia). Simpson explains that the potential disruption of a rain shower enhances the performance, with nervous energy added to the routine, thus suggesting that the possibility/anticipation of arrhythmia adds to the performance. Respite care, however, is probably not best described as an arrhythmic break since it is not damaging nor only a short-term enhancement (Simpson, 2008, 2012), but a temporary and planned disruption to maintain the metastability of caregiving by avoiding a slippage into an unstable state.

6. Discussion

The caregivers' experiences demonstrate various elements that typify eurhythmia as a metastable equilibrium. While the routineness of the substantial rhythms may appear stable, our unpacking of the relational rhythms and the disruptions demonstrates that the rhythms of caregiving are not arrhythmic; they do not "break apart, alter and bypass synchronisation" (Lefebvre, 2004, p. 77) nor are they an "equality of rhythms" (Lyon, 2020, p. 27). Instead, caregiving is a eurhythmia: a metastable equilibrium consisting of multiple substantial and relational rhythms and subject to numerous gradual and sudden disruptions. And whilst metastability goes hand-in-hand with change, unlike arrhythmia, these disruptions are nuanced and subtle to the extent that eurhythmias appear macroscopically stable but often change and shift in unnoticeable ways. Indeed, the case study of informal caregiving epitomises metastability since the caregivers and care recipients were often subjected to (minor) disruptions in their everyday lives due to the degenerative nature of the disease. The caregivers detailed how the caregiving practice is highly changeable (e.g., "*care is very dynamic. It will always be a changeable thing in a sense of what works one week may not the following week*" - Mrs Law). The emphasis on routine establishes an outward image of stability; however, the continual disruptions and changes to the caregiver and recipient's daily rhythms epitomise metastability. Thus, a consideration of metastability provides a new depth to rhythmanalysis, not just to explore the gradual changes that happen to rhythms and the layers and intricacies of rhythmic stability.

Lefebvre (1992, 1996, 2004) argues that the repetitive nature of capitalist production determines everyday life to the extent that capitalist systems dominate the body's natural circadian rhythms (Massey, 2019). Whilst the predominance of informal caregiving worldwide is a symptom of neoliberal capitalist agendas (Tronto, 2013), caregivers' everyday lives are dictated by the circadian rhythms of the care recipient. Indeed, a sense of order may be preserved in the cyclical repetition of circadian rhythms, which benefits the caregiver and care recipient. Still, the repetitive nature of the substantial rhythms of caregiving impregnates possibilities of the unexpected (Chen, 2017), such as falls and the effects of the progression of the disease.

Through our discussion of the relational polyrhythmias of caregiving, this paper expands upon the ongoing discussions on intersectional approaches to rhythmanalysis. Reid-Musson (2018) has been critical of Lefebvrian theory, arguing that it essentialises and fails to acknowledge how rhythms are gendered, racialised, and classed (Riley, 2021; Rouse et al., 2021). Their discussions have sought to address this oversight and develop an intersectional approach to the Lefebvrian theory. Whilst the experiences of both male and female-identifying caregivers' are explored in this paper, caregiving is predominately perceived as "women's work" throughout the world (Esplen, 2009). Yet through our discussion of the eurhythmias of caregiving, we have explored the multidimensional and relational nature of the practice and how it is experienced by individuals cohabiting their intersectional identities with their own needs and desires. Moreover, this paper has brought renewed attention to multiple bodies and further expanded Lefebvrian theory beyond eurhythmia as the healthy human body. Thus, our discussion of the eurhythmias of caregiving demonstrates how "processual and repetitive patterns and routines within which social categories of difference are both constituted and contested" (Reid-Musson, 2018, p. 892).

As a stable instability, metastability often goes together with change and disruption, and the eurhythmias of caregiving were often subject to tension, disruption and change. Indeed, Lefebvre (2004) argues that rhythms are always receptive to reorientation and change. And whilst many scholars have explored disruptions to rhythms (Simpson, 2008, 2012), this paper has gone beyond a discussion of immediate or sudden rhythmic disruptions. Instead, we have explored the gradual changes in caregiving routines by unpacking the notion of metastability in discussions on eurhythmia. Indeed, most caregivers mentioned that there was not a specific event that led to them becoming caregivers or increased their caring responsibilities but that they gradually picked up more tasks. Furthermore, we have shown a diversity of outcomes when the caregiving eurhythmia is disrupted from the development of arrhythmia (e.g., loss of existing friends) to a new state of metastability (e.g., the relational networks of formal and informal caregivers). Thus, the typology of eurhythmia as a metastable equilibrium unpacks the gradual and subtle development of, and changes to, rhythms and the potential to influence and advance other research topics and interests in health geography beyond dementia care.

7. Conclusion

Whilst eurhythmia is often described in contemporary literature as a harmonious or smooth combination of rhythms (e.g., Lyon, 2020), we establish that eurhythmia is a more nuanced concept through a consideration of metastability. Previous discussions on eurhythmia considered it the optimum polyrhythmic assemblage precisely because of its apparent congenial and harmonious qualities and instead focused on discussions around arrhythmia. However, existing literature in health geography and nursing often details the sporadic yet functional routines in the geographies of care (Zisberg et al., 2007), which are neither harmonious nor arrhythmic. Bringing together the lifeworlds of dementia care and rhythmanalysis, we have refined and advanced the concept of eurhythmia as a metastable polyrhythm. The consideration of metastability, as a state of apparent equilibrium in constant collapse and reformation, allows for consideration of the gradual and subtle shifts in the rhythms. In doing so, we unpacked rhythmic nuances within individual day-to-day routines of UK informal carers, but this approach has the potential to explore across a longer spatio-temporal scale (e.g., across the disease's stages) or in different socio-cultural contexts. Indeed, as such, metastability enables us to move beyond the immediacy of rhythmic breaks and explore the subtle changes that occur in (poly) rhythms, but also accounts for moments where the metastability or norm is returned: "*Dementia is [a] dynamic condition. It changes and will suddenly get worse in many respects, and then suddenly stabilises*" (Ms Bradley).

While there were arrhythmic moments in the caregivers' experiences, this reemphasises the metastable nature of caregiving eurhythmia: a metastable state is not a perfect state but a workable state (Anderson, 2002; Kibele et al., 2015). Indeed, Simondon (2009), in their discussions on individuation, describes metastability as systems that are macroscopically stable but internally characterised by an uneven distribution of potentials. However, by looking (broadly) stable or workable from a distance, caregiving risks being seen as not a priority in society and policy. Indeed, many caregivers demonstrated how their caregiving role was becoming increasingly unsustainable with the increased need for respite care. So, since the metastability of caregiving can quickly slip into an unstable or arrhythmic state, the UK's ongoing reliance on unpaid carers to support people with dementia will prove unsustainable (Limb, 2016). Indeed, around 850,000 people currently live with dementia in the UK and based on demographic changes; this could exceed 1,200,000 by 2035 (Kingston et al., 2018; NHS England, 2022). Yet the years of neoliberal agendas have led to NHS underfunding, cuts to council budgets, and the grossly inadequate social infrastructure necessary to address the needs of an expanding ageing population leaves dementia care in a precarious state. While this paper has explored the resilience and adaptability that arises from the metastable state, it is essential to remember that a metastable equilibrium is a temporary state that can quickly shift into a different state; and, sadly, the reality is that it is likely to become unstable unless the caregiving rhythms are sustained, improved, and supported by governments and society.

Indeed, eurhythmia, as a metastable equilibrium, has the potential to influence and advance other research topics and interests in health geography and the social sciences beyond informal care. Not only does metastability provide a robust understanding of the ever-changing rhythms, but it also allows scholars to move beyond the immediacy of rhythmic breaks. We have demonstrated how this typology of eurhythmia can unpack gradual changes and the layers and intricacies of (macroscopically) stable rhythms. Thus, we believe that a consideration of metastability can attend to broader social science discussions and continue to move away from the stable/unstable dichotomy.

Funding

This project has received funding from the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme (Grant Agreement No. 802202).

Data availability

Data will be made available on request.

Acknowledgements

We would like to thank all the participants who took part in our research and shared their experiences and insights. We thank the two anonymous reviewers and Susan Elliot for their helpful feedback and support of the paper. Equally, our thanks go to Rich Gorman for their comments on this article and the health geographers of the IMGS 2022 for their feedback and encouragement. Finally, we would like to thank Judith Jarvis for assisting with the transcription of the interviews.

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