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Quality of Working Life in the Circular Economy: the Case of Self-employment in the Repair Sector

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Abstract

Establishing a circular economy is assumed by some definitions to include social benefits such as employment opportunities; however, research beyond quantitative job creation projections is only recently emerging. While the repair sector is well-established, it has been suggested that increasing circularity implies significantly expanded demand for this service. This article uses five case studies of repair workers, based on semi-structured interviews, to explore self-employment in the repair service sector. Findings indicate that the stresses of work in the circular economy are similar to those of other fields, with self-employment offering opportunities both for job satisfaction and additional pressures. Research needs to give more consideration to the social implications of a circular transition—work may be a necessity for a satisfactory life experience (for most people), but it is under-ambitious to assume that having work is sufficient to achieve that, or should be the limit of ambition for a sustainability transition.

Keywords Circular economy · Quality of working life · Repair · Self-employment · Social sustainability

Introduction

Circular Economy (CE) has become a hegemonic approach to resource efficiency in academia, business, and public policy. It is frequently cited as a tool towards job creation and, in turn, social sustainability and equitable economic distribution [1–3]. For the purposes of this research, CE can be understood as a system where value is retained throughout the extended lifecycle of materials and is realised through a number of retention options including refuse, reduce, repair, refurbish, remanufacture, repurpose, or recycling [4–6]. While job creation in this (or any) area is generally considered a social benefit, comparatively little work has been done to understand the quality of work that might be created through a CE transition, with the notable exception of health and

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safety concerns over waste management and informal employment [7, 8]. Much of the research on social aspects of CE approaches the subject from a high level (e.g., ethical considerations of implementation [9] and social framework development [10]). Some research in CE implementation has considered employees' perspectives on CE practices and strategies [11], and there is a call for more research on regional skill supply and demand [12]; however, very little attention in CE research has been paid to the actual experience of those directly engaged in its operation.

There is a challenge in defining what a CE job might be (as opposed to a reformulation of an existing job, or how distinctions might be drawn with other environmental roles [13]), but one sector that fits the description well is repair. Repair, the act of restoring the functionality, aesthetics, or safety of a product [14], in itself is not a new activity; but it is being rediscovered and given new life thanks to the CE. Repair is fundamental to extending product life, implied by the 'refusal' to purchase something new. It has also been seen as a sign of hardship or lack of options [15] (in the spirit of 'make do and mend' promoted to save resources in the UK during World War II). However, after recent decades with a mentality of, and products designed for, the 'throwaway society', the cost of repair can be higher than replacement [16, 17] and poses a significant barrier to adoption [18]. Upcoming initiatives such as the right to repair may help to overcome identified obstacles (e.g., access to repair manuals and supply of parts) [19].

Items such as buildings, cars, white goods, or industrial equipment are expected to have a lifetime longer than their components and are routinely repaired or 'maintained'. Smaller consumer items (e.g., electronics, clothes, and toys) have a lifetime more likely to be limited by that of the first component to fail. Repair, when it happens, covers a huge range of activities spanning the requirements and components of these unique items. The work carried out may be done by a department within a manufacturer, as a service department in any type of organisation, or by a specialised company which could be an automotive repair chain or an individual. In addition, the recent so-called repair cafes have begun to appear offering services and learning opportunities for free. The balance between different models of delivery and opportunities to earn a living in repair will vary according to the geographic context.

CE is often viewed through the lens of sectors, companies, or cities, but the employment opportunities arising from a CE may not be jobs created in particular places by existing organisations, but rather an entrepreneurship on the part of individuals [20]. Or to put it another way, in addition to what may be termed mainstream capitalist employment, a CE may in certain geographical contexts provide new economic niches from which individuals may seek to earn a living through self-employment. This may be particularly the case in geographic areas that have lost some of their larger companies/heavy industries without the emergence of newer, tech-focused companies through which technological innovation might create other types of CE opportunities. The reality in the UK, for example, is that self-employment is growing faster than the growth of salaried/employee positions in the same region, and the majority of that self-employment is by the solo-self-employed (i.e., business owners with no employees) [21]. This category of solo self-employment holds different characteristics than both employment positions and the self-employed with employees. For example, the earning potential for the solo-self-employed is significantly lower than those with employees [22]. Skilled trade occupations are the highest proportion of solo-self-employment in the UK, making up 23% of the group [23]. The following article therefore focuses on the case of small, independent repair shop owners (including, but not necessarily solo-self-employed) as an example of a skilled trade occupation within the CE.

The theoretical framework for this study comes from the quality of working life (QWL) literature. This is a sizeable body of research addressing employment from a primarily quantitative perspective, although there are calls now to complement this research with qualitative approaches [24]. Solo-self-employment *quality* is attracting scholarly attention (a review of which will follow); however, research connecting quality of working life to CE or other approaches to (social) sustainability is limited. This is despite the identification of quality and conditions of work as a key aspect of employment in CE [25]. Using QWL as a lens through which to examine the experience of employment in a CE field offers a means to address an important social aspect of the CE—that is to consider what the implications are for those who are most actively engaged in the implementation. This contrasts with a significant portion of the research to date quantifying job creation, implying that simply the generation of employment is a sufficient social benefit of a CE [1].

This research uses the case of Kingston upon Hull (hereafter Hull)—a port city situated in the northeast of England, which is often described as an economically deprived region [26]. The aim of the article is to explore the experience of and influences on self-employed people working in the CE in an industrial port city—a city which is undergoing a transition to a less carbon-intensive economic base focussed around renewable energy and the CE. We ask individuals self-employed in the repair industry how and why they started their businesses, and how they feel about the day-to-day experience of their jobs.

The following sections present a review of QWL literature to identify and discuss emerging issues relevant to solo/self-employment. This article then explores these themes in the context of self-employment in the repair service sector through a series of semi-structured interviews with business owners. We use a qualitative approach to navigate the various themes of QWL in relation to social sustainability principles. Our conclusions illustrate the trade-offs individuals make in their specific contexts and how their experience relates to structures outside the organisation such as economic pressures and corporate power dynamics.

Quality of Working Life

Although so far overlooked in CE research, there is a distinctive field devoted to examining the experience of work [27]. Known by several terms (e.g., good work, quality of work, and quality of employment, among others), for the purposes of this article, the term Quality of Working Life (QWL) will be used for consistency. This field emerged from an appreciation of the fact that job experience is widely varied (besides variations in remuneration) and that certain minimum standards should be expected for worker well-being [28]. There has been an evolution over time from a recognition of basic human rights in the 1960s, with a focus on intrinsic qualities of work, through to today, where the field has expanded towards multi-dimensional analysis. Aspects of the study now include, for example, psychological well-being, consideration of the 'whole life space' and how work impacts other aspects of life, external contextual conditions of employment, skill development, and job satisfaction [24, 27–30]. While the multi-dimensional nature of QWL is widely accepted, the criteria used to assess it are varied and differ in definition between studies. Nonetheless these criteria provide a valuable basis for inquiry.

QWL is also recognised as being observable and measurable at various levels or spatial scales. These levels have been conceptualised in different ways; however, they can be loosely defined as (1) individual, (2) organisational, and (3) societal levels. For example,

the distinction between the quality of work and quality of employment alludes to first an organisational level of internal job characteristics (work) and then to a societal level of contextual conditions (employment), such as national pension policies [27]. Findlay et al. [31] expands on this idea, identifying two levels of within the workplace and without to enable the mapping of actors of influence for each. These include governmental organisations and policy, institutions, and additional organisations. There is an inherent geographic implication in these analyses, as many aspects of employment, particularly the political and legal context, will vary widely at the national scale. In this sense, the 'societal' level may be overly generalised, and a further national or regional level could be included to enable study with contextual specificity. There have also been attempts to conceptualise the levels of (1) the individual and the job, (2) the context in which the work occurs, and (3) the relation between the two to life outside of work [28]. The latter framework provides an important connection between the individual as a worker, and the individual as a human, whose life is made up of many more dimensions than their working life, but which may be affected by the quality of their working life. This is indicated by the criteria of 'consideration of the total life space' [28]. While a multi-level perspective is harmonious among much of the literature, there remains some debate about the levels to be included, and many studies will favour either an individual level or an organisational level as determined by the studies' purpose, the methods used, or the data available. As one level is investigated in detail over others (which may be necessary to learn more about a certain aspect), there is a danger that connections and linkages between these levels may be lacking, thereby missing an opportunity for causation identification. A case study approach may be useful to address this potential pitfall, which will be discussed in more detail in the methods section of this article.

The diversity in understanding of QWL and the indicators used to measure it have been viewed as a strength of the field, contributing to a more robust conceptualisation [27]. However, some tensions remain as to the appropriateness of certain metrics. The validity of job satisfaction is a particularly contentious issue in QWL analysis. Although job satisfaction is often used as a measure of job quality, Muñoz de Bustillo Llorente and Macias [32] show that self-reported job satisfaction level remains relatively unaffected by obvious dysfunctions in job quality, such as extreme drops in salary, or an increase in workers not receiving their salary on time. They argue that the personal level of job satisfaction is essentially dynamically seeking equilibrium based on the variables of conditions and expectations and that those expectations are based on individual characteristics such as personality. This may be a somewhat simplified view; other authors suggest that subjectivity is largely shaped by contextual characteristics rather than individual ones—aspects such as social norms, gender values, institutional factors, and social systems [24].

Findlay et al. [29] also highlight the contextual nature of quality of work and identify the importance of 'fit', although they also point out that consideration must be given to the amount of choice a person has in the jobs they may obtain (e.g., reflecting education or location). These contextual conditions then relate back to the expectations individuals may hold for themselves, e.g., a worker living in a rural area with few employment opportunities may expect lower-quality work as a result. Although self-reported job satisfaction may not be an adequate measure of job quality, it is important to consider. If the goal of QWL assessment is to contribute to worker well-being, as Grote and Guest [28] suggest, then self-assessed satisfaction is paramount. What is lacking perhaps is the integration of personal experience to the contextual causes for that individual experience. Research specific to the gig economy also suggests that a relational perspective, particularly in terms of an ethic of care, may be missing from the understanding of decent work [33]. Early

work on the subject of job satisfaction already notes the challenge of using indicators without the capture of context [34]. This article will argue that a critical realist approach (see below) can help to reconcile the tension between diverging pathways of analysis based on objective and subjective criteria as well as investigating the significance of a specific CE occupation.

QWL in Self-employment

Beyond the wider debate on the quality of working life, there is an emerging discussion specifically relating to the quality of self-employed and solo self-employed work. The literature suggests, at first glance, conflicting results relating to the impact of self-employment on health, financial distress, and job satisfaction. For example, in a multi-country analysis, it was found that financial distress had a greater impact on the health and well-being of self-employed individuals than it did on wage-employed individuals [35]. However, while financial burdens specifically may weigh more heavily on the self-employed, overall, Gauffin and Dunlavy [36] saw no evidence that low-income self-employed workers in their Swedish study were in a more vulnerable health situation than employed. In general, notwithstanding financial burdens, self-employment has been shown to have a positive impact on health, reducing hospital admissions in Portugal by half [37], and resulting in less work-related stress in Australia, particularly among the solo-self-employed [38]. This discrepancy could be explained through national public health and social security differences, which affect access to health care and soften the impact of low earnings on well-being. Where individuals are coming into self-employment from a state of unemployment or resource disadvantage, for example in the UK, where policy support is found lacking, self-employment 'shifts the social risks and responsibilities of employment from state and employers to those individuals with the least capacity to bear them' [39]. While the representation of solo self-employed individuals is emerging as a subfield to traditional employer/employee representation, the maturity of the subfield is geographically varied [40]. In fact, the transition from unemployment to self-employment is often due to a lack of employment options [41], with the precarity of the situation bringing with it additional sources of anxiety [39]. Even from wage-employment to self-employment, poor job quality is found to be the significant factor pushing such a transition, outweighing 'pull' factors relating to opportunity identification or personal characteristics [42]. The discrepancies in these studies highlight the need for a geographically contextual understanding of QWL.

The transition to self-employment has also been shown to reduce skill mismatch (i.e., the match between the skills required for a job and those of the worker), with evidence suggesting that a better fit in this regard leads to improved outcomes for workers such as economic performance, productivity, and psychological outcomes [41]. Furthermore, job satisfaction is often a measure used to indicate the quality of employment, and studies have shown that self-employment leads to higher overall job satisfaction, particularly when the values of workers prioritise criteria such as autonomy and personal interest [43]. However, it has also been suggested that over time, job satisfaction tends to wane, reverting back to pre-transition levels, with increased satisfaction being more permanent for men than women [44]. This gender discrepancy is also borne out by the structure and motivation of women's self-employment, where part-time work, working from home, and caring responsibilities are significantly higher than both self-employed men and wage-employed women [45].

Thus, the QWL literature identifies many relevant concerns and criteria to consider in the analysis of employment opportunities arising from CE, including repair. A tension exists in the QWL literature between objective measurement and the importance of personal experience, particularly in relation to the validity of self-identified job satisfaction as a useful or accurate measure of job quality. The 'quality' of work represents a social dimension of employment, as distinct from the more purely economic considerations of whether one has a job and the level of remuneration.

A paucity of research looking beyond a narrowly economic view of a CE has been a weakness in the field, despite its identification with sustainability [9], which aims to balance not only economic and environmental concerns but also social [46]. Industry leaders have identified a need for social assessment of CE; however, application has been limited to non-existent [47]. For employment specifically, scrutiny of CE's contribution to the United Nations' Sustainable Development Goal (SDG) 8 (decent work and economic growth) remains largely economic, with little focus on the quality of work [48]. Indeed, SDG 8 itself says little about the experience of work. It is taking a very international perspective, focussing on ensuring conditions found in the Global South are akin to those already legally protected in much of the Global North. Vitally important as that is, the current tumultuous changes in employment related to technological developments, the longer-term trend towards so-called flexible employment practices (i.e., the decreasing prevalence in full time 'jobs for life'), and more recently, the repercussions of the COVID-19 pandemic mean that employment experiences in the Global North also need critical analysis in terms of the opportunities for and impacts on individuals.

In this article, we are utilising a critical realist approach (see below) for an innovative qualitative case study of the experience of working in the circular economy in a particular place, the city of Kingston upon Hull in the northeast of England. The purpose of this is to use the QWL-based criteria as an entry point to discussion, and then to explore the underlying influences.

Methods

This study integrates a critical realist approach into the methods of examination in order to assess the underlying structural influences on employment that are difficult to disentangle from the mostly quantitative studies of QWL. Critical realism offers a middle ground between positivism and relativism. Positivism asserts that reality is observable, measurable, and absolute. It searches for patterns and generalisable cause-and-effect relationships but may offer limited explanation [49]. Conversely, relativism holds that reality is contextual and subject to experience [50]; explanations are therefore relevant only to the specific circumstances. Critical realism nods to both views by suggesting three levels of reality: the empirical, the actual, and the real [51]. The empirical level acknowledges a level of observable and experiential truth that is filtered through human interpretation (subjective epistemology). By contrast, the actual level encompasses everything that happens whether it is observed or not (objective ontology). Critical realists thus acknowledge an 'experiential' element, while asserting that some perspectives are closer to the actual truth than others. The third layer of reality contains the causal mechanisms which explain observations on the empirical level; research aims to find the explanation that may be closest to the 'real' [51]. Causation cannot be characterised by a simple cause-and-effect relationship where the observed regularity of an effect determines causation (such as characterising the positivist

approach). Instead, critical realism relies on an understanding of the underlying structure and the conditions or context under which a causal mechanism may activate, regardless of its frequency [52]. Thus, we are not quantifying without reaching an explanation, but neither are we assuming that each experience is entirely individual and cannot offer any wider lessons.

The need to explore the contextual circumstances around a particular situation (i.e., employment characteristics) is best served by a case study approach. Case study research is an empirical, in-depth inquiry into a contemporary phenomenon, which specifically allows the researcher to explore pertinent contextual conditions [53] and 'disentangle a complex set of factors and relationships' [54] in order to identify causal mechanisms that may apply beyond the bounds of the case study. For this study, in order to understand how employment in CE might contribute to social sustainability, we have used a case study of repair services in Hull.

The city of Hull was chosen as the spatial boundary for this study. Hull is located in the northeast of England in Yorkshire, along the Humber Estuary. It is a port city and has a long-standing history based on blue-collar employment. Historically a fishing town, the collapse of the fishing industry in 1976 led to wide-scale unemployment in the area [55]. While other industries have taken over (largely manufacturing and light industrial repurposing of the port), the city has more recently been categorised as a 'structurally disadvantaged city' [26]. This can be evidenced through statistics of the region, including the Index of Multiple Deprivation which ranks Hull as the 6th most deprived in income, 7th in employment, and 2nd most deprived in education [56]. The potential for places to benefit from environmentally based economic initiatives can be questioned [57], but if CE job creation is to have distributed benefits, it is these deprived regions that require attention and examination to understand the extent to which any benefits might be realised. Citizens in Hull have been shown to have a high willingness to participate in the repair economy [18]; therefore, the examination of the repair service sector as an opportunity for job creation and quality of work assessment was chosen, with a particular focus on small, independent businesses.

The proposed critical realist model has been operationalised utilising qualitative methodology, thus contributing to an emerging field of QWL assessment [24]. Semi-structured interviews were chosen as an appropriate choice for a qualitative data collection method for several reasons. Interviews allow for the capture of individual experience as well as the context surrounding that experience, complementing a critical realist approach. The semi-structured nature also allows for some standardisation in the interview, which aids in comparison, while still being fluid enough to allow for new information and ideas to emerge [58]. Most importantly, the less formal structure (compared to a fully structured approach) allows the researcher to explore the significance of responses based on context and follow-up questions, investigating underlying motives in a way other collection methods do not allow [58, 59].

Interview questions were developed with the purpose of discovering the quality of working life of individuals. For a multi-dimensional exploration, social sustainability principles [60, 61] and various QWL criteria identified during an extensive literature review were used as a basis for the themes to be covered during each interview. Questions were adapted to encourage generative and expansive responses, with the option for follow-up inquiry using a conversational approach. See Table 1 for examples of interview questions and the QWL themes they are based on.

In total, 73 shops whose primary focus was repair were identified in Hull. These included appliance, textile, electronics, and vehicle repair. Vehicle repair has been excluded

Table 1 Semi-structured interview question examples

Semi-structured interview question examples	
Example question	Rationale/theme
Could you take me through what one of your average workdays looks like?	Used in a free-flowing, conversational way to allow interviewees to signal what is most significant to them
Do you feel that you have enough time to complete all of your tasks?	Used as one gauge for health and stress level
Do you have the freedom to choose your tasks at work?	Used as one gauge of job control and influence level
What non-technical skills have you learned in your job? Were these skills supported by purposeful training?	Used as a gauge of competence and skill/capacity development opportunities
Are you proud of the work you do? In what ways?	Used to identify meaning/purpose beyond economic justifications for work

from this study, however, as the long history of repair in this sector makes it unlikely for these positions to represent emerging employment due to CE advancement. Attempts were made to contact the 48 remaining businesses. The timing of the COVID-19 lockdown restrictions likely decreased the success of contact; however, successful contact was made through either email or phone with 22 of the shops. Of those, five interviewees (see Table 2

Table 2 Characterisation of interviewees

Characterisation of interviewees	
Interviewee 1 (electronics repairer)	He is relatively new to business ownership, having opened his shop, which primarily repairs mobile phones, but also other electronics occasionally, 4 years ago. He currently works alone, although he has had a part-time employee in the past
Interviewee 2 (television repairer)	He is a veteran of business ownership (trading for 27 years) and is approaching retirement from his television repair shop. He has two full-time employees who mainly run logistics and customer service for him so that he can focus on repairs. His premises also serve as a warehouse of spare parts
Interviewee 3 (seamstress/tailor **1**)	She has owned her sewing shop for the last 20 years, and does some repairs, although mainly works on custom projects and alterations. She has primarily worked alone, although is in the process of taking on an apprentice
Interviewee 4 (appliance repairer)	He has owned his business for 9 years, doing house calls for white good appliance repair. He is not interested in hiring employees, but rather prefers the flexibility of working alone and for himself without the stress or pressure of providing enough work for an additional person
Interviewee 5 (seamstress/tailor **2**)	She has owned her sewing shop for 6 years after being made redundant from her previous job. The shop offers alterations, custom work, and repairs. The business has flourished to support three full-time and one part-time staff member, who work both on sewing tasks and bookkeeping. She is now considering how to transition towards retirement

for characterisation of interviewees) were identified based on the small or micro scale of their operations, their positions as business owners, and their willingness to participate in the study. While the small number of interviewees cannot be assumed to be representative of the repair sector as a whole, each participant provides insights into the diversity of experiences based on the type of product being repaired. In addition, similarities of experience and context with regard to quality of working life can also be identified and explored. Further interviews within each product category, or across different geographies would aid in determining the representativeness of results; however, these long-form, conversational interviews provide valuable insights for further research.

Interviews were conducted online via the Zoom software. The online format of the interviews was primarily due to the COVID-19 pandemic, which occurred during the data collection phase of the project and prevented in-person meetings. All interview recordings were then transcribed, and the transcripts were summarised and coded. Codes were initially based on the dimensions of quality of working life identified in the literature. A process of redescription then took place, whereby each of the authors analysed the summaries for additional emergent themes, which are explored in the results section below.

Results and Discussion

This section will present the results of the interviews discussed around the emerging themes of self-employment identified in the literature review.

Route to Self-employment

Interviewees had been in their present occupations for between 4 and 27 years. Despite this generational difference in the age of the businesses, there was a common theme of necessity (applying skills to earn a living) rather than an entrepreneurial spirit to set up a business to exploit a perceived market, or in an attempt to develop a new market. Seamstress/tailor 1 notes that her choice to start a business was borne out of the necessity to provide for her family. Likewise, seamstress/tailor 2 and appliance repairer started their businesses after being made redundant from their previous employment. Nonetheless, the sense of independence and flexibility of being one's own boss was highly valued by respondents. This was partly to cope with caring responsibilities, but also a more general sense of satisfaction at not working for someone else. As will be discussed below, however, these benefits come with disadvantages too.

Identification with the Circular Economy

When thinking of repair as a crucial component towards CE, it is important to consider how the environmental merits of repair were perceived by the service providers. In practice, very little emphasis was placed on this aspect of the work. Indeed, all interviewees have been working in the repair sector since before the CE reached its current prominence (though one can note that academic prominence even on the level of the CE does not equate to public awareness). Asked to consider the environmental aspects of the job, appliance repairer says 'I like to think it is a worthwhile kind of job. Some appliances go to landfill. I am not a particularly green person. But fortunately, I do quite a green job.' The television repairer extensively describes his reuse of materials, and in fact, he keeps a large inventory

of unrepairable products to be used for spare parts. However, this choice is largely based on economic factors rather than any desire to be eco-conscious.

Rather than an ethic of environmental stewardship, an ethic of care emerged as a defining aspect of the sense of self-worth as an aspect of job satisfaction. For example, the electronics repairer describes a relationship that he has built with a repeat customer, where he finds himself making decisions in the interest of the customer rather than on immediate profitability. He describes a mother who brings her daughter's phone in for a screen replacement every 3 months, saying, 'I feel sorry for [her] to be honest. I give her a free screen protector every time and a case some other times. Just to try to minimise the risk when the daughter drops it.'

Similarly, the television repairer reminisced about his most rewarding activity related to his work, when he would volunteer to check the televisions in the oncology section of the hospital. He explains, 'because one of the best things you can do is go into a room and somebody's really not well with cancer and the TV's not working and you walk in and you leave that room and they've got a TV. Because they can not get out of bed and the smile on their faces, you couldn't put a price on that.' This sense of pride in being able to help someone who might not have the skills or ability required to fix something themselves was a common theme among interviewees. The electronics repairer reflects that 'it makes me feel happy to see other people happy'. It is potentially these moments that encapsulate job satisfaction for these individuals, and while things like flexibility and stress have a significant impact on their day-to-day experience, upon wider reflection, it was often these aspects of care that came through as significant and meaningful for the interviewees. This is a well-documented phenomenon in care services (e.g., long-term care and nursing), where the perceived social benefit is seen to improve job satisfaction among workers [33, 62].

Skills, Knowledge, and Experience

Lying behind all of these examples is the possession of marketable skills on the part of the service provider. As self- or solo-employed individuals, they define the remit of their business around the skill sets they possess. This results in a gender-stereotypical division with the two female interviewees working with fabrics, and the three men with various electronic items. While repair work is a technical trade, interestingly, little formal training was mentioned by interviewees. When directly asked, most who have received formal training seemed to minimise its importance for their work or success. This is with the exception of the appliance repairer, who mentioned valuing the safety component of his education. All interviewees, however, emphasise experience and natural aptitude as drivers of success. For example, the electronics repairer states, 'I see it as very easy. Maybe someone would damage the phone if they opened it. But I don't need to see a video on how the new phone screen would be replaced. I would just find my way.' Similarly, the television repairer, when asked about his educational background said, 'I was put on a placement which took me off the benefit system … It was just to get the unemployment figures down. The effect of the college was very, very minimal to what I do today.' Instead, lifelong learning is embedded in repair work, as every job will present different challenges, and technology changes over time require new skills and updated information.

While these skills are ones that might feel effortless to those who are defining their career around them, the business and managerial skills required to operate a business, for some, require a more concerted effort. In these cases, training or mentorship programs would be helpful. For example, the seamstress/tailor 2 concedes that, 'I'm only good with

the sewing, the rest of it is the hard part.' This was a sentiment that was echoed by all interviewees to varying degrees; however, those with employees were able to delegate some of those undesirable tasks (customer service, logistics, or bookkeeping to name a few) to others and focus more on the work that they enjoyed. The skills required for the management of staff, however, are a barrier for some, and while those individuals may benefit from delegation, either the pressure of maintaining enough work for multiple people or the concern over personality dynamics prevent them from scaling their business in this way. For these individuals, the transition to self-employment may have improved their skill mismatch in terms of the use of their technical repair skills, affirming results seen from Albiol-Sánchez, Diaz-Serrano [41]; however, the competencies needed to run their business, and particularly to manage staff, opens another dimension of skill acquisition that was not always present or pursued. Furthermore, the fast-paced nature of the work leaves little time for future planning or capacity building, particularly when the business is new, with a sense of survival permeating day-to-day operations. As one interviewee stated, 'obviously you did every bit of the work you could to keep yourself going'. That same interviewee, however, also spoke about more recently exploring and developing her marketing skills and indicated some regret about not pursuing this sooner. It seems, therefore, that with the maturity of the business, capacity for skill development also increases. Nonetheless, opportunities for self-development appear to be limited.

When hiring staff, again, formal qualifications were not a priority. For example, the electronics repairer requires a demonstration of skill when hiring new staff (e.g., performing a screen replacement); however, the way in which those skills are obtained was less important. He explains his informal criteria for employees by saying, 'You might have a friend who is very good with phones or computers that other friends would go to him and ask for advice. I would be looking for someone like that.' Similarly, the seamstress/tailor 2 states that none of her staff have formal education, but instead were self-taught. Practical and proven skill and quality of work are clearly valued much higher than formal qualifications in this industry, which may indicate an opportunity for employment for people without access to extended formal education. Customer service and social skills also ranked high in skill requirements for hiring staff. This preference for (seemingly) innate skills may stem from the recent history of Hull, with a reliance on unskilled work in the fishing industry, and the (at least perceived) lack of outside support to bring new jobs, leaving a distrust of formal institutions [55].

Work–life Balance and Control

The interviewees reported contrasting experiences of work-life balance—both the extent to which they felt in control of this balance and their attitude towards it. Most interviewees expressed that they felt rushed during the day. Variations in how interviewees felt about this partly reflected the difference between being solo-self-employed or having employees with whom to share the work. The electronics repairer, for example, works alone and expressed a struggle and/or frustration to complete jobs and schedule work, reflecting that at times his interactions with customers may seem short or unfriendly, simply because he is stressed about finishing a job on time for a previous customer. Conversely, another owner with no staff (appliance repairer) says that he needs to turn down jobs in order to ensure that he has adequate time to complete existing jobs to a satisfactory level of quality. The difference between these two experiences may be related to the maturity of the business. Several interviewees shared that they experienced a transition between the early years of

their business, when all jobs were accepted to keep the business afloat, to later years when a customer base was established, and they were able to have more flexibility to turn down jobs that they did not have time for or were not comfortable with the work. In either case, however, these solo owners/operators relate to the feeling of being rushed in a negative way, and either cope with the stress out of necessity or take steps to balance the workflow.

On the other hand, those working with a team of staff seemed to relate differently to the rushed atmosphere. One interviewee (television repairer), while expressing being very busy during the day, also characterises it as a 'steady flow', saying that 'there's never two days the same in that shop', suggesting that the variety in work holds his interest. Another interviewee (tailor/seamstress 2) with staff again discusses the time pressure and hectic environment in the shop, saying that they are too busy to offer an express service; however, she also states that the team will always take tea and lunch together, and talks about trading jobs based on enjoyment or expertise, ensuring the work is done efficiently. This team atmosphere seems to transform what might be a very stressful grind for an individual, into an energetic challenge for the group. These observations might lead one to believe that working within a team provides an opportunity for greater health. This finding is somewhat in conflict with previous work which found that self-employed with employees experienced substantially higher work-related stress than the solo-self-employed [38]. However, these results do not necessarily indicate that the team atmosphere corresponds to less stress, but rather that the experience of that stress is changed by the comradery of the group. This result would also be highly dependent on the group dynamics of the staff, and the skill set of the employer.

Some aspects of work/life balance relate to schedule flexibility. Three interviewees brought up their families in different ways. The appliance repairer observes that having control over his schedule as a business owner has enabled him to work around his young daughter's schedule, which was a very important consideration as a single parent. Seamstress/tailor 2 mentions how much she appreciated being able to temporarily drop work 1 day a week to care for her new granddaughter. While these examples reflect an ability to maintain agency in work/life balance, that is by no means guaranteed. Seamstress/tailor 1 states that it has been difficult to separate work life from home life. For example, she discloses that she has not taken a holiday in 20 years, and frequently mentions the immense pressure that she is under to maintain the business, which at times has taken a toll on her mental health. In theory, she can determine her own hours and elect not to work, e.g., around school hours. In practice, however, this was immensely difficult given the total number of hours of work needed to gain a viable income. Having even one employee might offer some greater flexibility—but with low profit margins that is hardly an option.

It is worth noting here that of the five interviewees, three mentioned familial responsibilities. Of those three, two were women. While the gender discrepancies revealed in previous studies [44, 45] are crucial to addressing systemic inequalities between gender groups; in this case, the root of this inequality seems to be attributed to primary childcare responsibilities, regardless of gender.

Industry Context

A significant issue to emerge from the interviews was the significance of contextual factors, i.e., circumstances that are beyond any element of control by the service provider but which frame the circumstances of their operation. Interestingly, the most

prominent contextual factor is one that relates directly to the CE, i.e., collaboration with other companies in the value chain.

Interviewees expressed concerns in relation to access to information and/or components and spare parts. The appliance repairer explains that 'the problem that we have in the industry is that manufacturers guard their information very jealously.' For example, the electronics repairer explains that while there are components readily available through Amazon or eBay for most cell phones, the quality of these parts can be very low and difficult to assess before purchase. While the original equipment manufacturers' (OEM) repair technicians will have access to the original parts, he must rely on agents in China to source his replacements. The television repairer also expressed frustration that his access to components was limited, and, when available, marked up to a price which undermined the competitiveness of the repair. The appliance repairer shared a specific example of this, where a particular brand of a printed circuit board, for third-party engineers, requires the purchase of a single-use card reader (costing about £20) to program the new bar. This purchase immediately puts him at a disadvantage compared to the agent engineers with access to the proprietary software. While all interviewees, with the exclusion of the textile repairers, mention these external forces to some extent, often indicating an unfairness with regard to competing interests of large OEM corporations or the rate and trajectory of technology changes in general, their perception was of limited to no personal agency to affect these conditions. This lack of public access to information and/or parts needed for repair is a known issue that has received attention from the public and has gained some traction from policy-makers [63]. What we note in particular here is the constraints on individuals attempting to earn their own living from a CE. Larger companies tend to have advantages in a capitalist system, where power dynamics and economies of scale influence their access to manufacturing, logistics, influence on legislation, and their ability to safeguard their intellectual property even when this appears to be against the public interest. For small or micro businesses, competing with these larger companies from a purely economic standpoint may be futile in the current capitalist system, and alternative economies and value propositions may serve to bolster their competitiveness in the local community.

The appliance repairer was also concerned with regard to disclosure of information to consumers. He mentions that model-specific repair manuals, to his knowledge, do not actually exist. Although as an engineer he does not need them, he suggests that access to such information would go a long way in enabling the average person to tackle a repair themselves. In fact, he goes on to say that the single best change that could be made for the industry is to have a reparability index or grading system available for customers, so they can make an educated decision when purchasing an appliance and know how repairable it is. While the focus on these industry-wide barriers is likely related to the interviewees' position as owners of their businesses, it remains a challenge to be noted particularly with regard to local and small business success. The viability of repair as a positive force towards CE relies on local enterprises, as the logistics associated with transporting goods long distances diminishes the environmental benefit of the repair and also sacrifices the opportunity for local employment benefits (i.e., social benefit). While OEM manufacturers may have local branches for repairs, independent repair shops represent a significant portion of the industry, and therefore, overcoming their barriers to compete and contribute is important for the development of a local CE.

Conclusions

This article has taken a critical realist approach to examining the experience of CE work in the form of a solo- or self-employed repairer, using the city of Hull as a case study. In terms of the QWL criteria, we found that the respondents experienced varying levels of ability to control their work–life balance, and their experience of stress in response to similar conditions was variable. They are skilled workers, using pre-existing skills to find an opportunity to earn a living on the margins of the mainstream capitalist economy. Their work is helping to prolong the lives of products and keep associated materials, labour, and money circulating locally [64], indicating dimension to the Hull CE. However, the critical realist approach enables us to dig beneath the direct responses to the QWL criteria in order to understand the causal factors influencing the way the respondents experience their respective situations.

CE-relevant skills enabled interviewees to set themselves up in business—i.e., by having some directly marketable skills, they can sell their abilities as self-contained services directly to clients—drawing on the lack of skills/confidence of the wider population (e.g., [18]). This has allowed some sense of control, but ultimately the running of especially a solo-self-employed business appears to dictate the quality of working life, which indeed becomes difficult to separate from quality of life. On an empirical level, the maturity of the business influenced the capacity to both develop skills and manage time. Having a small team involved in the business was important for improving the ability to manage workload and achieve some flexibility (e.g., the ability to turn work away during busy periods). Even managing the daily routine to cope with family obligations cannot be assumed—some respondents had this option, but not all. The passage of time, however, does not seem to guarantee that opportunities for self-development or for expanding the business will come about—so maturity might be less of a factor than the profit margins of the specific occupation. The time that would be needed for development—whether that is learning how to run a business, coping with the administration of hiring staff and then managing them, or developing new technical skills—comes out of the time that is spent running the business as is and/or directly doing the work. For individuals, this is a disadvantage of self-employment compared to working in a larger organisation with more flexibility for distributing work. Furthermore, the business does not necessarily generate profit margins sufficient to utilise some of that profit for hiring another worker. Income is limited by the rate it is possible to work, in addition to the amount of work available, and the amount that the public is able/willing to pay for the service. If the demand exists, then hiring staff might enable some economies of scale and the ability to gain more control through the utilisation of others—but the threshold to reach that point is too great.

These livings being made around the fringes of the mainstream economy are nonetheless inextricably entwined with it. A major constraint on the electrical/appliance-based enterprises was access to information and parts needed to repair products. Although discussions around the right to repair might redress the balance, manufacturers decidedly hold the upper hand. Even if and when changes are made, it will remain to be seen whether the public repair for themselves or seek help—indeed the manufacturers and distributors may see this as an opportunity for business development.

Although respondents were pleased to learn of the environmental benefits of their work, these did not motivate them or help to achieve a sense of satisfaction. Social aspects, or an ethic of care (for people, not the environment), were a strong motivation. The social aspirations and satisfaction of these CE workers resonate more with the aspirational academic

definitions of a CE than the more resource/environmentally driven vision of policymakers. This is specifically true of the approach of Hull City Council as well as England and the EU [65]. This also chimes with the experience of social enterprises in Hull [66]. This attitude of helping others might reflect the nature of the city, with a long (if disrupted) history of community support [55], and might also account for the disdain for formal qualifications. These aspects of a social circular economy may not work as well in different types of cities, but notably even in Hull, are providing a recipe for a lifetime of hard work, rather than an escape from the so-called rat race of employment.

This study contributes to CE research by contextualising CE employment within existing and emerging QWL discussions. While many CE studies acknowledge the significance of employment, and in a broader articulation, the social dimension of CE, taking a qualitative approach to investigating the quality of employment is novel in this field. This study, however, should not be mistaken as representative of all CE employment, or even of repair employment in other geographies and contexts. The value of the critical realist case study approach is found in the richness of the data, and the insights it provides. However, there are limitations to this approach as well. Critical realism offers a framework for exploring causation in a particular circumstance, as a route to uncovering causal mechanisms that may be more generally applicable. However, caution must be taken when generalising results to different contexts. To substantiate these results in different industries, geographies, or time scales would be a worthwhile area for further research. Furthermore, the focus of this study is narrowed by the solo or self-employed identification of participants. Future research into comparisons between QWL in CE/repair as a business owner versus an employee would be beneficial to the field. Finally, while this study has taken the first step in exploring the intersection of CE and QWL, each of these topics orbits around sustainability research. Formalising this connection in the literature would be a substantive step towards a more ethical CE.

Declarations

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