



## Original Research

# A comparison of office workers' co-creation experiences: A Health CASCADE multiple case study

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## ABSTRACT

**Objectives:** Co-creation can be used to develop public health interventions, improve their effectiveness, and increase intervention uptake through engaging stakeholders, but there is little in-depth exploration of the co-creators' experience of taking part. Understanding the experience of taking part in a co-creation process can enhance future participation experiences, promote engagement and help design better co-creation processes in the future. The objective of this study was to explore the experiences of co-creators (i.e., office workers) involved in the co-creation process to address workplace sedentary behaviour.

**Study design:** Multiple case study.

**Methods:** Three small-to-medium sized enterprises participated in separate co-creation processes. Data were generated from observations during the workshops and semi-structured interviews (n = 31) employing elicitation techniques conducted after the co-creation process was completed. Each of the three cases were analysed separately (using thematic analysis), which then informed the cross-case comparison, the focus of this study.

**Results:** Comparison of co-creators' experiences across the three cases identified psychological, emotional, social and cognitive experiences which occurred before, during and after the co-creation process. The analysis identified both intended (e.g., sedentary behaviour awareness) and unintended (e.g., forming relationships) outcomes from these experiences. These experiences and outcomes were influenced by factors such as workplace environment and structure, design of the co-creation process and how it was facilitated, highlighting the interplay between the co-creation context and the broader work context.

**Conclusion:** This study contributes to the understanding of co-creation experience in the workplace setting. Recommendations were derived from using an iterative reflection process of the three cases.

## 1. Introduction

Co-creation is defined as “any act of collective creativity that involves a broad range of relevant and affected actors in creative problem-solving that aims to produce a desired outcome”.<sup>1</sup> Co-creation is used for public health interventions to ensure interventions are tailored to the needs and preferences of the public, improve their effectiveness, and increase intervention uptake through meaningfully engaging relevant stakeholders.<sup>2</sup> Co-creation offers a promising approach to address

workplace sedentary behaviour.<sup>3,4</sup> High amounts of sedentary behaviour are associated with an increased risk of poor physical and mental health.<sup>5,6</sup> The sedentary behaviour of office workers is high (70% of work hours).<sup>7–11</sup> Workplace health promotion research has traditionally focused on larger organizations, but most businesses in the United Kingdom are small-to-medium enterprises (SMEs, <250 employees).<sup>12–14</sup> As well as having fewer employees, SMEs differ from larger enterprises in terms of organisational cultures, structures, and resources, e.g., leadership styles, capacity, and finance to innovate.<sup>4,15</sup>

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The process of co-creation is important, because how the process is designed and facilitated influences the outputs success as an effective and sustainable solution.<sup>2</sup> Without an evaluation of the process, co-creation risks being ineffectively applied,<sup>16</sup> and evaluating co-creators’ experience is recommended.<sup>16</sup> Co-creation experience is defined as “stakeholders’ psychological states, feelings and perceptions associated with their involvement and interactions with other stakeholders before, during and after the co-creation process”.<sup>17</sup> A recent scoping review<sup>17</sup> highlighted an overall limited use of theory to underpin co-creation experiences even though some theories could be used such as the theory of Psychological Ownership<sup>18</sup> and Self-determination theory.<sup>19</sup> For instance, Self-determination theory can be used to understand how stakeholders’ engagement can be nurtured in ways that are beneficial to them personally, and also to the co-created outcome.<sup>20</sup> The limited use of theory may stem from the complexity of co-creation experiences which are situation and context specific. Additionally co-creation continues to evolve in response to technological advancements and an expanding evidence base, making it challenging to identify a single theory that adequately encompasses all aspects.

The scoping review<sup>17</sup> also found that few publications had the primary focus on evaluating co-creators’ experiences, although, such evaluation can serve to identify areas for improvement in the process, and provide benefits to the co-creators through their active participation (e.g., acquiring knowledge/skills).<sup>21</sup> Therefore, this study aimed to evaluate co-creators’ experience of a co-creation process targeting workplace sedentary behaviour conducted in three SMEs in Scotland.

## 2. Methods

### 2.1. Recruitment of companies and participants

Scottish SMEs with a significant proportion of desk-based employees

**Table 1**  
Overview of the cases and action group participants.

	Case 1	Case 2	Case 3
Company	Construction Management	Charity	Charity
Company size	150 employees	100 employees	30 employees
Company description	The company had two offices that worked on different construction sites. Both offices were located on or near the construction site with which it was affiliated. The action group consisted of employees from two offices, with participating co-creators from the non-hosting office travelling to office that was hosting with an approximately 15-, 30-, 40- minute travel time either by car, public transport or walking between both.	A charity organisation that provided counselling and support services to those experiencing mental health difficulties such as stress, anxiety and depression. The organisation’s operations extend beyond the office setting, as some employees (e.g., therapists) work off-site with schools and community groups. The company operates in different venues throughout Glasgow. The workshops were hosted in the office headquarters, with all of its co-creators originating from this same location.	A charity organisation that provided advocacy support for people seeking assistance in various different health and social care issues. This company operated from a single office site, where it hosted the workshops.
Co-creation process (macro overview)	9 weeks, 8 workshops of 90 min, Oct–Dec 2022.	7 weeks, 6 workshops of 90 min, Jan–Mar 2023.	7 weeks, 6 workshops of 90 min, Apr–May 2023.
Co-created action plans	Co-created action plan to establish (1) a walking challenge for office staff for on-site walk rounds, (2) a hot standing desk area, (3) games break-out space.	Co-created action plan to establish (1) a 5-min step break in each meeting, (2) table tennis, (3), step challenge, (4) need assessment for work equipment.	Co-created action plan to establish (1) daily calendar reminder to stand/stretch/walk, (2) step challenge, (3) fun away day, (4) outdoor meetings.
Action group composition	10 employees (2 female, 8 male). Age ranged from 29 to 58 (M = 41.3, SD = 10.6). The length of time in employment at the company ranged from less than a year to over 10 years. 6 reported they supervised/managed other staff. All held higher education qualifications.	9 employees (7 female, 2 male). Age ranged from 19 to 55 (M = 41, SD = 12). The length of time in employment at the company ranged from less than a year to 19 years, with most (n = 7) being employed at the company for four or less years. 7 reported they supervised/managed other staff. 7 held higher education qualifications, and 2 had secondary education qualifications.	12 employees (11 female, 1 male). Age ranged from 25 to 60 years (M = 38.33, SD = 12.28). The length of time in employment at the company ranged from one year to 23 years (M = 4.83, SD = 6.41). 3 reported they supervised/managed other staff. 10 held higher education qualifications, 2 had secondary education qualifications.
Average attendance across all workshops	66 %	89 %	71 %
Number of co-creators interviewed	10	9	12

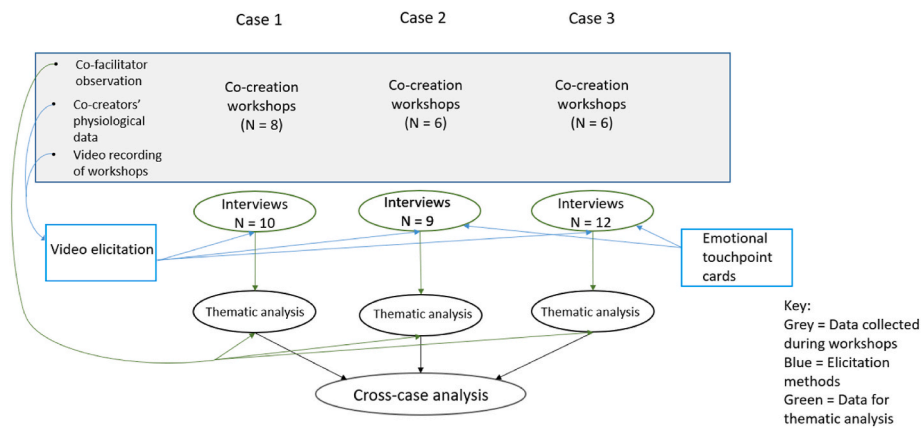
(self-reported), which were not currently participating in initiatives to address sedentary behaviour, were recruited using a study website, social media, email, and newsletters. Interested companies met facilitators to ensure a feasible timescale and signed a memorandum of agreement setting out expectations and responsibilities. Individual employees were recruited to form an action group (6–12 co-creators) using convenience sampling; recruitment flyers and information sheets were distributed by a primary contact employee.

### 2.2. The co-creation process

The co-creation process was conducted in the three companies sequentially. Action group participants took part in workshops (~90min duration) with the overall aim to co-create an action plan to address sedentary behaviour (Table 1). The co-creation process plan permitted flexibility and variation in discussion based on the unique contexts of each company. All co-creation processes followed similar steps (introduction, knowledge building, exploring the company’s context, action planning) using various methods, tools, group activities, and facilitated discussions.<sup>22</sup> Each workshop began with people settling in, and then the workshop agenda was shared and the goals and activities outlined. Workshop activities (e.g., presentation, brainstorming) formed the bulk of the workshop time (see Supplementary file 1), including a 5-min break. Workshops ended with an evaluation form completed by each attendee and information of what to expect at the next workshop.

### 2.3. Evaluation of co-creators’ experience of the co-creation process

To evaluate the co-creators’ experience a multimethod approach was used, drawing data from observations during the workshops and interviews conducted after the co-creation process (Fig. 1). Observations during the workshop were made by one facilitator (LMcC) and were



**Fig. 1.** Sources of data for collection and analysis.

written into field notes at the earliest opportunity after each workshop.<sup>23</sup> These notes included information about interactions among co-creators, their apparent engagement based on behaviour and verbal input, and the general workshop atmosphere. A debriefing session (10–30 min) between the facilitators immediately after the workshops facilitated reflections and observations were shared, therefore, field notes may also include reflections. Audio-recorded interviews ( $n = 31$ ) were semi-structured, using an interview guide<sup>24</sup> designed to explore co-creators' experiences of the co-creation process, including positive and negative aspects, expectations, workshop content, the decision-making processes, and perceived learnings from involvement. The questions were developed based on a review of the literature and the Self-determination theory,<sup>19</sup> specifically drawing upon the sub-theory Basic Psychological Needs, which focuses on the three psychological needs of autonomy, competence and relatedness. For example, the need for relatedness was captured in questions about collaborations between co-creators. Two elicitation techniques were employed during the interview to prompt recall of emotional experience. Preliminary analysis of SME1 data identified the opportunity to assist the participants in describing their experience more deeply. Emotional touchpoint cards<sup>25</sup> were introduced for interviews conducted in SME2. Co-creators were invited to select a card that best represented their experience, which then served as a point of further elaboration. These cards were effective in eliciting emotional experience and their use retained for SME3 interviews. All workshops were video recorded, and selected video clips were played to co-creators during interviews to aid recall and discuss specific moments. Clips (max 5) were chosen based on changes in physiological response (heart rate, skin temperature and electrodermal activity) continuously recorded by wrist-worn monitors (Empatica E4, Empatica Inc., Milan, Italy), video quality and representation of different types of workshop content. The purpose of collecting physiological data was to identify relevant video clips for eliciting further exploration of experiences associated with those moments, rather than for independent analysis.

#### 2.4. Analysis

Interviews were transcribed and pseudonyms assigned to participants. Analysis was conducted in two stages. Firstly, data from each case was analysed separately. Thematic analysis consistent with Braun and Clarke<sup>26</sup> allowed for the identification of recurrent and dominant themes in the data. Transcribed interviews and observations were coded and themes were generated from the coded data by grouping together similar codes. Themes were refined in an iterative process of discussion with research team and recoding (Supplementary file 2). The second stage of analysis, the cross-case comparison, was guided by the three high-level steps proposed by Miles and Huberman<sup>27</sup> of data reduction, data display, and conclusion drawing/verification, and conducted using

the findings from the within-case thematic analyses. To gain an overview of the data, themes generated within each case were examined and data assembled into comparable groups. Several working drafts of tables and figures were used to help organise the data coherently. This iterative process involved identifying patterns or reoccurring causes of experiences across the cases, as well as examining exceptions and differences in experiences. Asking questions such as 'What accounted for the difference in experiences?' or 'Why do we see more of one experience (e.g., frustration, ownership) at one SME and less in the other SMEs?' enabled contrasts and comparisons to be identified. Through analysis we developed an analytical framework (Fig. 2) to present and discuss the findings. We categorised experiences as social, emotional, cognitive or psychological (Fig. 2). We also identified intended and unintended outcomes from involvement. Outcomes refer to changes or effects on an individual or group that result from their experiences. To interpret the data, we viewed it chronologically by linking co-creation experiences to events occurring before, during, and after the co-creation process. Company context and the co-creation context also influenced co-creator's experience. Company context refers to the circumstances, conditions, situations, or workplace environment that enable or constrain the co-creation process. Co-creation context refers to the overall design of the process, its structure, format, length, methods and activities used and how the process was facilitated. No predefined theoretical framework was applied to guide the analysis.

### 3. Results

#### 3.1. Description of participating companies and participants

Data for this study were gathered in three different companies in the Glasgow region of Scotland, a construction company and two charities, with between 30 and 150 employees (Table 1). The 31 employees who participated as co-creators are not a full representation of their respective companies, but included a range of job roles (e.g., human resource) and positions (e.g., senior manager). A selection of co-creator quotes is provided in Table 2 to illustrate their experiences.

#### 3.2. Co-creators' experience of the co-creation process

##### 3.2.1. Motivation for being involved in co-creation

Similar reasons for joining were evident across the cases. Improving personal health and collectively contributing to a healthy workplace were two reported reasons for participation, which reflect intrinsic motivation. Additionally, participants reported being influenced by a senior colleague who asked them to participate, which reflects an extrinsic motivation for participation. There were variations across SMEs in how co-creators perceived this invitation to take part. Some individuals in SME1 and SME2 perceived a sense of pressure to join,

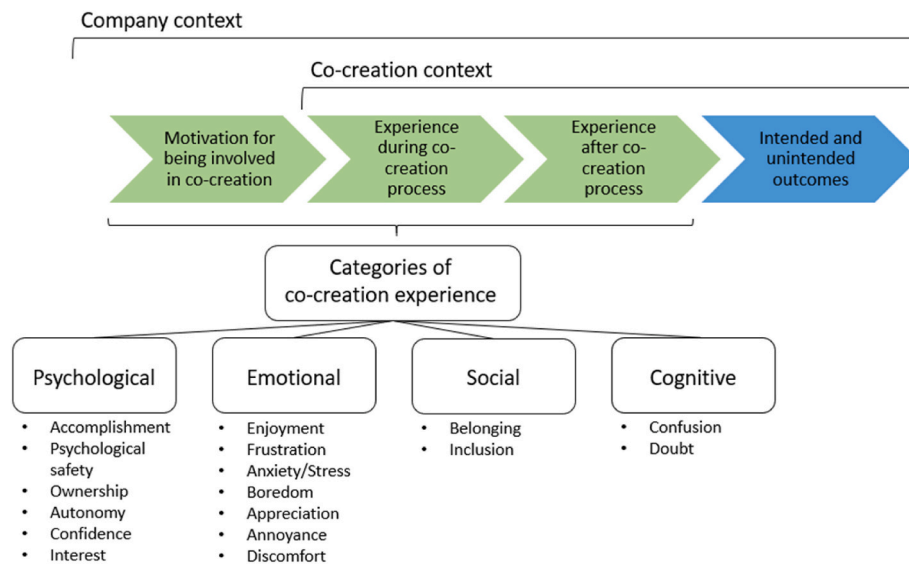


Fig. 2. Analytic framework and categories of co-creator's experience of the co-creation process.

which stemmed from the influence of senior colleagues and from perceiving their invitation as a request, despite the voluntary nature of participation as expressed by the facilitators. However, in SME3 it was perceived more as an open invitation. In all three cases, a senior employee who served as the primary contact for the facilitators took the lead on recruiting other employees to join the action group. Differences were apparent in how each of these primary contacts approached recruitment, in terms of their style and communication strategies.

### 3.2.2. Experience during the co-creation process

Within each action group, co-creators expressed enjoyment in the co-creation process, especially from interactive methods that promoted engagement, creativity, a sense of fun and created memorable experiences, particularly in SME1 and SME2. Individuals favoured certain types of methods over others, largely due to personal preference which influenced how they engaged with activities during the workshops. Many co-creators from each action group enjoyed the brainstorming methods because it allowed them to think creatively and have fun. In general, however, it was observed that visual methods and use of stickers/post-it notes to be useful aids in fostering engagement, enjoyment and sparking creativity and discussion, across all three SMEs.

All co-creators spoke of their enjoyment for interacting with others and getting to know each other better. Interacting and forming relationships was particularly evident for co-creators who did not usually work with the others or if their job role was more solo than collaborative in nature. A sense of feeling comfortable and relaxed in the workshops was common across all three action groups, indicative of psychological safety. This experience was influenced by the co-creation company, in SME3 the workshop environment was perceived as similar to the workplace environment, reinforcing existing good working relationships. Experiencing psychological safety was also influenced by the co-creation context, specifically the facilitators' approach and personal characteristics. Perceiving the facilitators as approachable and friendly helped to foster a comfortable and safe space for co-creators to participate. Tailoring the facilitation to suit the working style of the company and their workplace environment helped to support the co-creators and gain their trust. A supportive environment and positive atmosphere whereby co-creators and facilitators showed support to others' ideas, without judgement or criticism, helped create psychological safety. An inclusive environment, whereby co-creators' inputs into group discussion were heard, respected, and valued, also contributed to psychological safety. A sense of belonging to the action group was particularly apparent in SME1, which may be partly because the action group

comprised employees from two different office sites that typically had little interaction. Consequently, some employees were unfamiliar with one another, which may have heightened the importance of fostering a strong sense of belonging. In contrast, at SME2 and SME3, all the employees in the action group at least knew of each other or had seen each other in the office before, even if they hadn't directly worked together.

The emotional experience of frustration was evident in all three action groups. A distinction can be made between frustrations associated with the co-creation process and those associated with interpersonal conflicts. In SME1, frustrations were experienced because of the perceived slowness of the co-creation process which contributed to some co-creators losing interest towards the end. In response to their perceptions, the process was subsequently condensed for SME2 and SME3. In SME2 and SME3, frustrations were mostly associated with interpersonal interactions. The interconnectedness of employees' job roles and position in the company and its influence on power dynamics within the action group played a role in these interpersonal frustrations. In SME2 one person was perceived to have too much influence on decision-making resulting in challenging group interactions and leading to frustrating experiences. In SME3 frustration arose when co-creators felt that their opinions or ideas were met with resistance and dismissed by others during discussions or when they perceived that some group members were not contributing equally to the discussions.

Both SME2 and SME3 co-creators expressed autonomy over the co-creation process plan and the activities set out in the workshops. They remarked how the facilitators provided them with control over the process by providing flexibility, taking on board their suggestions and feedback. Although Tara (SME3) expressed she did not think the proposed co-creation process design plan needed to change, she felt they had the autonomy to adjust the plan to their needs or preferences. This suggests that the co-creators experienced the overall co-creation process as acceptable and satisfactory for meeting their needs and requirements.

Different levels of stress and anxiety were reported between action groups, which were attributed to employee workload. Some individuals perceived that by attending workshops they had less time to complete their primary work responsibilities, evident in SME1 and SME3. The average attendance across all workshops, SME1 (66%) and SME3 (71%) were lower than SME2 (89%). It is important to take into consideration the unique nature of employee's jobs and company context which likely play a role in perceived job demands and resources available to them to cope. For example, in SME1, co-creators mentioned that tight deadlines and the dynamic nature of their work often led to important meetings cropping up unexpectedly, which prevented them from attending the

**Table 2**  
Co-creator's quotes illustrating experience associated with events before, during, and after the co-creation process.

Experience		Co-creator quotes
Motivation to be involved in co-creation process	Intrinsic motivation	<p>"I was interested in what we could do as a business to help improve the working conditions here. Because as I think everybody recognizes that we spend far too long sitting at desks" (Colm, SME1)</p> <p>"We are sat down all day everyday Monday to Friday ... So I just wanted to see what we could do to get more, like be more, not sedentary, to get up and about more and find ways to implement it because we do really struggle" (Grace, SME2)</p> <p>"I know that I don't stand up and I sit too much basically and I know that so I was quite interested to sort of be involved in the group and find out advice on how to combat that, but also for it to be accepted throughout the organisation" (Harriet, SME3)</p>
	Extrinsic motivation	<p>"My <u>only</u> reason for joining is that I was nominated" (Howard, SME1)</p> <p>"But you weren't asked [by colleague]. You were told, like, you're coming to this. <u>But</u> not in a bad way" (Susan, SME2)</p> <p>"one of my managers coming over my desk and being like, 'hey would you like to be in this group?' And I was like, 'sure' [laugh] ... it was <u>really</u> just being asked, it wasn't just like, 'you're coming', it was more about, 'would you like to be', and I was just like, 'sure, why not? Let's do it'" (Chloe, SME3)</p>
Experience during co-creation process	Psychological safety	<p>"[I] didn't feel at any point that I was being ignored. Felt <u>really</u> at ease, that I could speak up ... Didn't feel like I was getting judged if you were going to speak up and felt I could speak to you guys [facilitators] as well, so yeah it was good ... I feel that was listened to and anything that I said was ... respected. Didn't feel like anyone at any point was like, <u>no</u>, or ... looking down. I don't feel like anyone was judging. It was very kind of open, honest, judge free group." (Haley, SME1)</p> <p>"Overall with the workshop, it helped that it wasn't a huge group, it was nine of us, so it felt like we had enough time to get around each person with ideas and nobody was really talking over anybody or anything to try and diminish their point" (James, SME2)</p> <p>"I'd say the overall workshop experience, it was very inclusive ... it did feel like a really safe space and inclusive, everyone had the opportunity to speak, but at the same time if there was people who were maybe feeling a bit quieter, there wasn't that <u>pressure</u> to make them talk in front of everyone" (Maire, SME3)</p>
	Enjoyment	<p>"It [the quiz] was something new. I never joined the quiz in those particular forms. Yeah it was quite cool in the way it was presented, the way it was measured and the reaction time. Yeah no I thought it was enjoyable ... I was getting competitive (laughs)" (Marty, SME1)</p> <p>"I really enjoyed it. I have actually still been doing the desk-exercises with the team. We normally do them on a Friday or any opportunity we've got 10 min ... or even if we are just feeling tired or rubbish or having a bad day we are like 'okay guys let's do some desk-exercises'. So, we use it more than just being sedentary, we use it to actually just feel better with what we are doing or just take a break from what we are doing as well." (Grace, SME2)</p>
	Autonomy	<p>"We had a nice time, it was fun, we had a laugh, an opportunity just to be away from your desk thinking about something different that will hopefully make positive changes" (Tara, SME3)</p> <p>"I think, you know, [facilitator] did give us a bit of autonomy with regards to, you know, if we needed more time then ... we could carry that forward into the next [workshop] ... If we'd wanted to discuss that [activity tracker data] more, then there was the autonomy to do that. So, I do think we did have some control. I don't think it was as if you came in and, right, this is it - it's rigid" (Anna, SME2)</p>
	Stress/anxiety	<p>"It didn't feel as though it [workshops] was being too guided ... I did feel as though we had a kind of element of control over things" (Chloe, SME3)</p> <p>"It wasn't a good feeling. I was like, quite on edge. Like, I remember running back to my desk, put my headphones in and just being like that kind of anxiety kicks in. So there's a few Fridays like that I think. I know [action group member] maybe had one as well (laughs). So yeah, Friday kind of was a wee bit of a, not a, low point but yeah, maybe would have preferred it to another day. But again, it's everybody's preference. Some people might be deadlines on Wednesday, deadlines Monday" (Haley, SME1)</p> <p>"there were some days I think there was a meeting right after I got back [from the workshop] where I was like, I don't know if I can do this [workshop] right now [laugh] I have so much to catch up on so I guess I was more stressed in that sense but related to the workshops themselves, no, I was pretty relaxed" (Julia, SME3)</p>
	Frustration	<p>"I think it began to flow far better at the end than it did at the beginning. I think at the beginning it was a little bit frustrating because we didn't really move I think. I think the process could have been done <u>considerably faster</u> with the same outcome ... so I could understand the process. I just think that we had the capability round the table to go <u>faster</u> in the process" (Howard, SME1)</p> <p>"at one workshop I did feel a bit frustrated and it wasn't the fact that people had a different <u>viewpoint</u> to myself, that wasn't what it was because I just, I think somebody had mentioned 'Oh there's no point in answering this because [job role] will have the final say', like meaning [action group member]. I had said, 'well what's the point in us answering the question then if youse have already decided that [job role]'s going to' ... I felt a bit frustrated because I thought we're a group and it's not about one person making the decisions because the purpose was as a group we would come up with a plan. So I think that was the only time that I ever felt frustrated in the group" (Anna, SME2)</p> <p>"For me it [teamwork] felt positive but there were periods where I was quite frustrated and that wasn't through any of yourself or [facilitator] input, I guess it was due to maybe lack of input from other group members and there were some workshops where I felt frustrated probably and slightly maybe, I don't know, not as heard within the group as I would have normally" (Martina, SME3)</p>
Experience after co-creation process	Doubt	<p>"I don't think [company name] will change anything as of yet. I think that's what we need to try and keep pushing for. I think we've obviously set up a group between the, how many individuals we've got, so I'm hoping that will continue. I don't want us to fall by the wayside because I think there's a few good ideas ..." (Eric, SME1)</p> <p>"Again, it's still that kind of reserved curiosity to see whether or not they actually [implement change] ... kind of sitting back and thinking, I wonder if they're actually going to disseminate these things or make them available." (Richard, SME3)</p>
	Sense of accomplishment	<p>"it's got people that weren't in the workshop talking about it [action group] just from seeing us being in it. Its good ... It's a good feeling. Especially because you're encouraging people to be healthy ... it's good feeling. It's good to have ideas as well that maybe, these people that haven't been in the workshop haven't had so when you're telling them your idea, and they're like, 'that's actually good', you feel, you get a buzz (laughs)" (Haley, SME1)</p>

Note. Underlined text indicates where the co-creator placed emphasis.

workshop.

### 3.2.3. Experience after the co-creation process

When co-creators in SME1 shared their ideas and progress with individuals outside the workshops and received positive feedback, they felt a sense of accomplishment and validation. Some co-creators in SME1 and SME3 expressed doubt as to whether the co-created action plans would be implemented and make a difference to reducing workplace sedentary behaviour. For example, Richard, SME3, expressed a “*reserved curiosity*” which suggests feeling that there were some reasons to hope for positive change, whilst also protecting himself from disappointment. Some SME1 co-creators expressed uncertainty about the long-term viability of the action group and its ability to achieve meaningful outcomes because people were busy and might not complete tasks they volunteered to do.

### 3.3. Intended and unintended outcomes from involvement

Intended outcomes from the co-creation process included raised awareness of sedentary behaviour among co-creators and maintaining changes made to reducing sedentary behaviour during the co-creation process. Educating co-creators about the health implications of excessive sedentary behaviour and providing space for them to explore their own sedentary behaviour patterns was a fundamental component of the co-creation processes which laid the foundation from which co-creators could use this knowledge to work towards co-creating an action plan to address sedentary behaviour in their workplace. For example, Lucy (SME3) expressed: “*I became more conscious of my sitting habits ... it made me focus a lot more on like the days where I knew I was going to be sitting*”.

For some co-creators their knowledge building and learning experience translated to feeling motivated to take action and adjust their daily behaviour habits to reduce their sedentary behaviour. Examples of actions were not limited to work hours and included, going for a walk at lunch time and taking the dog to work (SME1), standing to have a cup of tea and awareness of activities when they tended to sit for a long time (SME2), standing in the train and getting off the bus a stop earlier to finish the commute walking to work (SME3). This suggests that involvement in co-creation is a means to promote motivation to change.

Unintended outcomes included, in SME1 and SME2, forming of work relationships with colleagues they wouldn't ordinarily work with, thereby expanding their support network. This was particularly evident for SME1 which had two different office sites. Lewis (SME1) expressed the team building experience with a sense of togetherness and camaraderie between group members which was facilitated through collaborative nature of the workshops: “*I think there was a feeling the camaraderie. I would look forward to it [workshops] and come up with ideas and what can we do*”. Forming relationships was not a feature in SME3, likely due to the smaller company size ( $n = 30$ ) with a single open-plan office site, resulting in employees already being familiar with one another.

Encouraging other employees to break up sedentary time and disseminating health information outside of the company to significant others were both complementary unintended outcomes evident in SME2 and SME3. For example, Molly (SME2) shared: “*I'm more aware of my own behaviours now and I'm trying to encourage other family members [to reduce sedentary behaviour]*”. Co-creators in SME3 provided evidence of instigating healthy changes to the company beyond sedentary behaviour. Anna (SME3) shared that for company refreshments: “*normally it would be biscuits and things and now its fruit ... it's just all these wee slight changes ... I know that's not what your remit was but it's impacted wider [than sedentary behaviour]*”.

## 4. Discussion

This multiple case study explored the experiences of co-creators' involved in co-creation processes to address workplace sedentary

behaviour in three different SMEs. Co-creators reported a range of mostly positive experiences, categorised as psychological, emotional, cognitive, and social experiences. This study highlights the potential of co-creation to engage employees in workplace health promotion strategies, to raise awareness of public health concerns such as sedentary behaviour, and to ensure that co-creators voices and priorities shape effective solutions.

Overall enjoyment was a prominent experience, particularly derived from the collaborative way of working. Both the company context and co-creation context promoted psychological safety within the action groups. The workshops' supportive and inclusive environment fostered team building and productive collaborations, which led to the beneficial outcome of forming and strengthening work relationships. A supportive environment naturally facilitated productive collaborations among co-creators, essential for successful teamwork.<sup>28</sup> Allowing room to express negative experiences and share negative evaluations can be beneficial as long as there is psychological safety. The benefits experienced by the co-creators aligns with the ‘*welldoing*’ approach advocated by Davis et al.<sup>29</sup> A ‘*welldoing*’ approach to co-creation means the process contributes to both achieving a collective solution or outcomes for a project and simultaneously contributing to co-creators well-being.<sup>29</sup>

The company context, job demands, existing power dynamics, and hierarchies impacted co-creators' participation and collaboration during the co-creation process. Conducting co-creation during work hours may add to job demands if no additional support is provided, and can be challenging to integrate with work tasks.<sup>30</sup> According to the Job Demands-Resources Model<sup>31</sup> job resources are necessary to manage job demands and support motivational processes for enhancing work engagement, performance and reducing cynicism.<sup>32</sup> Managing job demands has implications for companies to offer resources and support that enable employees to engage in co-creation and integrate it into their work tasks.

From joining the action group to collaborating in workshops, there were existing hierarchies and power dynamics within each of the companies that influenced participation. The motives for joining are theorised to influence the nature of co-creators' engagement. For instance, Self-determination theory<sup>19</sup> suggests that external pressure to join motivates people to get involved to avoid shame or guilt, or seek approval and self-esteem, which may result in resistant behaviours. On the other hand, people who are intrinsically motivated join because they are inherently interested, which may result in better quality engagement. Unequal power sharing, where a team member exerts influence (positive or negative) on the group process can create conflict among other team members.<sup>33</sup> Conflict is perhaps an inevitable aspect of collaboration and teamwork, making it crucial to identify.<sup>34,35</sup> When managed effectively, conflict can be productive, leading to mutual understanding, more robust plans by addressing potential issues, and the development of strategies to handle future conflict.<sup>34</sup>

Although some co-creators felt motivated for personal change, there was some doubt experienced after the co-creation process about whether co-created action plans would be implemented. This uncertainty highlights the need to incorporate a stronger focus on implementation within the co-creation process to ensure a higher possibility for implementation, which may reduce the experience of doubt, ultimately supporting both personal and company-wide change. To ensure successful implementation of the co-created action plans, action groups may require the involvement of stakeholders who have the authority to implement the action plans, especially during the implementation phases. Future research should investigate the experience of implementing co-created solutions, and examine how motivation for involvement impacts experience during and after the co-creation process.

There is limited existing research directly evaluating co-creators' experience,<sup>21</sup> but given the importance and complexity of managing the social and relational dynamics involved in engaging diverse stakeholders,<sup>36</sup> practical guidance on facilitating co-creation is essential for improving the co-creators' experience. Some of the similarity in the

range of experiences reported across the three cases could be because the co-creation processes were similar, addressing the same topic, using an in-person workshop format with the same facilitators, with data collected using an interview guide seeking both positive and negative aspects of experience. However, based on the experiences of co-creators in this multiple case study we recommend that future co-creation processes should use interactive methods that involve incorporating different stakeholders' opinions. When co-creators feel able to participate and have fun whilst doing so it fosters engagement. To minimize negative experiences, we recommend that facilitators should be well-prepared, be flexible to the needs and preferences of the co-creators and support co-creator involvement. Additionally, for co-creation in the workplace support is needed from the company to manage the additional demands on employee time for engaging in the co-creation process. Although derived from experiences of employees participating in workplace health promotion, these insights are applicable to public health and health promotion more widely. Fostering engagement through interactive methods, providing skilled facilitation, and respecting the time and effort co-creators invest are likely to improve their co-creation experience and contribute to the development of tailored, effective and sustainable public health interventions.

### Author statements

#### Ethical approval

Ethical approval was obtained from Glasgow Caledonian University's ethics committee (HLS/PSWAHS/21/229) and all participants provided informed consent.

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#### Competing interests

None declared.

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### Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.puhe.2025.01.034>.

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