Research Article

CITIZENS' SUSTAINABLE ENGAGEMENT IN CITIZEN SOCIAL SCIENCE (CSS) PROJECTS: THE EXPERIENCE OF THE YOUCOUNT PROJECT

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Citizen Social Science (CSS) is a methodological framework which implies the involvement of non-professional researchers – that is, citizens scientists (CSs) – in scientific projects along with professional researchers. Citizens voluntarily decide to engage in these projects with no expectation of economic rewards; thus, understanding the factors sustaining their motivation and commitment, as well as the enrichments stemming for them and for the beneficiaries represent relevant issues for sustaining their engagement in such projects. Aim of this study was deepen CSs' experience within the project "YouCount - Empowering Youth and Cocreating Social Innovations and Policymaking through Youth-Focused Citizen Social Science", funded by the European Union under the Horizon 2020 programme. Nine interviews were conducted and analyzed using the Thematic Analysis methodology. Intrinsic motivations seem to be the most relevant for CSs' involvement in CSS projects as well as to maintain their engagement over time. Even though difficulties may arise during project activities, flexibility and positive relationships represent key resources to overcome them while avoiding dropouts. Overall, CSS can produce impacts and relational goods both with reference to their beneficiaries and to the CSs involved. A better understanding of these aspects can provide professional researchers, CSs, and project beneficiaries with further enrichments, as it will be discussed.

***Keywords**: Citizen Science (CS), Citizen Social Science (CSS), Young Citizen Scientists (YCSs), YouCount, volunteer participation, engagement*

1. Introduction

Citizen Science (CS) is a methodological framework foreseeing that scientific activities are carried out by professional researchers along with non-professional scientists – that is, citizens – who volunteer to participate in data collection, analysis, and dissemination of a scientific project (Haklay, 2013). Therefore, it is a methodology aimed at developing new knowledge by actively involving citizens in scientific processes (Irwin, 1995). The citizens who are involved in scientific projects within this framework are usually defined Citizen Scientists (CSs) (Haklay, 2013).

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Thus, with CS the need to open academic knowledge and scientific tools to the participating public – mainly composed of citizens who voluntarily decide to contribute to the resolution of problems encountered within their community, without being driven by economic interests (Haklay, 2015) – stems. In the development of CS, two aspects are particularly relevant: the first concerns the scientific communication of knowledge in order to disseminate it also outside the scientific community; the second refers to the process of knowledge co-creation, in which the collaboration between citizens and professional researchers unfolds in the processes of data collection and analyses, as well as use of tools to think of creative scientific solutions to the challenges present in the social and community context. The inclusion of citizens within scientific practices gives CS a horizontal and democratic approach to knowledge production processes, in which all social actors actively collaborate in the various stages (Bonney, 1996).

Therefore, CS shares with participatory action research (PAR) and community-based participatory research (CBPR) the focus on the active involvement of citizens in the promoted collective processes. Indeed, according to the theory of collective action and social change (van Zomeren et al., 2008), such involvement can help reducing inequalities and enhancing group effectiveness especially in socially disadvantaged groups (Dixon et al., 2017). However, despite some similarities, CS well differs from both PAR and CBPR and should not be overlapped with them. Indeed, PAR foresees the involvement of citizens in studying social problems affecting their lives with the aim to determine how to act to solve them and improve their individual and collective daily life conditions (Cammarota & Fine, 2008) – that is, they are involved in intervention processes, not in research ones. Similarly, in CBPR the community affected by the issues under investigation is foreseen as a privileged partner to be involved in the projects along with researchers, who yet remain the only ones who hold the methodological rigor of scientific research (Viswanathan et al., 2004) – that is, again, citizens get involved in the unfolding processes, yet they do not learn how to play out research-related tasks.

In order to create an environment of true collaboration and participation, having the commitment of all community members is necessary to ensure that different perspectives and needs are properly considered and respected. Dialogue, supporting the empowerment of disadvantaged communities and groups, adopting concrete tools to promote access to available opportunities and resources, promoting positive relationships, maximizing diversity, and creating shared goals are some of the strategies identified for the achievement of this goal (Juvonen et al., 2019; Littman, 2021).

In light of this, the motivation of CSs to take part in the scientific knowledge production path and maintain this commitment over time represents a critical issue for the success of a CS project (Nov et al., 2014). Therefore, the present study was aimed at investigating the experience of young citizens who took on the role of CSs within the project “YouCount - Empowering Youth and Cocreating Social Innovations and Policymaking through Youth-Focused Citizen Social Science” (from now on, “YouCount”), a Citizen Social Science (CSS) project funded by the European Union under the Horizon 2020 (H2020) Science with and for Society programme, paying particular attention to the motivations that led them to the initial involvement and the maintenance of the same throughout the project, their experience in the role of CSs and the impact they felt the project had on them and the social groups involved, consistently with Omoto and Snyder’s (1995) focus on the antecedents, experiences, and

consequences of voluntary engagement activities and with the understanding that motivational aspects and engagement levels are tightly connected (Peters et al., 2018).

2. From Citizen Science (CS) to Citizen Social Science (CSS) projects

CS has been predominantly pursued in the natural sciences (Crain et al., 2014, Hecker et al., 2018); in quantitative terms, most of the scientific output is in the fields of ornithology, astronomy, meteorology, and microbiology (Kullenberg & Kasperowski, 2016).

Over time, different categorizations of CS projects have been made based on the level of citizen participation and engagement. Among the most recent ones, Haklay (2013) identifies four levels of involvement: (a) crowdsourcing: the cognitive engagement required from citizens is minimal, the resources they offer are only in terms of time and devices; (b) distributed intelligence: in addition to collecting data, citizens also carry out interpretation and classification activities of the collected material; (c) participatory science: involvement starts from the very beginning of the project, citizens then help to define the research questions and objectives as well as collect the data and analyze them but the expert researcher still has high levels of control; (d) extreme CS: all stages of the research process are defined synergistically between scientists and citizens, the role of the former is confined to facilitation and this leaves glimmers towards a citizen science carried out entirely by the latter.

Similarly, Bonney et al. (2014) categorize CS projects into (a) co-creation, (b) collaboration, and (c) contribution ones based on the degree of citizens' involvement in the research process: in the case of contribution, which foresees the lowest level of involvement, citizens only participate in the data collection and processing phases; in the case of collaboration, citizens also participate in the data analysis and interpretation phases, as well as playing out in any practical implications that may arise (e.g., the interventions developed from the findings); finally, in the case of co-creation, citizens are involved from the very first stages of the project, i.e., from the co-design of research questions and tools to be used.

Conversely, to authors' best knowledge CS has still found little application in the psychosocial sciences, with the role of CSs being mainly linked to the analysis and collection of sources in the fields of philosophy, art, literature, or languages over the years. This seems surprising, as this potential field of application relates directly to issues of social life, such as health problems, the effectiveness of social institutions, and social equity (Heiss & Matthes, 2017). However, due to the activation of relational and collaborative processes that working with social groups and communities entails, involving citizens in CS projects in the field of humanities and social sciences requires them to play out different forms of engagement, as well as to develop not only technical skills but also those related to being in relationship with the participants in the project (Hartshorne et al., 2018; Kanjo & Noisespy, 2010; Mody et al., 2009; Sadiković et al., 2020; Youyou et al., 2017). In these cases, CS is referred to as Citizen Social Science (CSS) (Albert et al., 2021; Tauginienė et al., 2020) to highlight its focus on social and community dynamics.

Overall, CSS can be defined as that scientific research in the humanities and social sciences that are carried out by relying on the cooperation between professional and non-professional

researchers – that is, citizens – who voluntarily get involved in scientific projects (Göbel et al., 2022). The main difference between CS and CSS project is that the latter work with CSs' perceptions of their social world as data (Butkevičienė et al., 2021): therefore, it does not rely on citizens only as passive political elements but includes them in the transformative change of political systems and institutionalized research (Albert et al., 2021; Kythreotis et al., 2019). For example, depending on the degree of their involvement in the research teams, tasks that can be performed by CSs in this kind of projects may refer to co-defining research questions and how to address them, administering questionnaires or interviews, (co-)facilitating group discussions, running observations, (co-)analyzing qualitative and quantitative data, co-creating strategies for involving participants or for showing them the results of the project along with professional researchers. That is, in CSS projects CSs are required to work with their own and others' perceptions about the surrounding physical and social worlds and the social processes characterizing it.

Thus, a CSS project can be read as a circumscribed intervention within a given social context that takes on very specific material and abstract connotations; it can be compared to a system characterized and defined by a set of subsystems, i.e., individual parts that give meaning and a specific framework to that system through their interactions. In this sense, it is possible to speak of a Citizen Science Ecosystem (Mačiulienė et al., 2021), focusing not only on the individual components that are part of a unitary process – as in the case of CS projects – but also on the interaction between the parts that make up the system. This stands consistent with an ecological perspective, within which communities and societies are to be understood as a series of nested and intertwined social systems, whose features, representations, and interactions are shaped by and shape its members' behaviors, beliefs, and understandings (Bronfenbrenner, 1979; Lewin, 1951; March & Olsen, 1989; Wiesenfeld, 1996). In this vein, individual and collective behaviors result from the interaction of individual and environmental characteristics and dynamics (Lewin, 1951). Therefore, promoting a change in a social system or even at the individual level means expecting that some additional changes will occur in other systems too (Bronfenbrenner, 1979). Based on this, participation in CSS projects can allow CSs to reduce their marginalization with reference to their community of belonging by actively taking part in the design and implementation of different relational patterns and power balances (Naqshbandi et al., 2023).

In this sense, the creation of a collaborative social network that jointly acts to achieve shared objectives in a given social context is at the basis of a CSS project (Butkevičienė et al., 2021). Indeed, the interaction between the parties is an indispensable feature to implement and guarantee the success of a CSS project, which implies some critical elements such as the active participation of all social actors, horizontal and inclusive collaboration, and the co-creation of creative solutions to solve social issues thanks to the knowledge provided by scientific professionals. Based on this, a fundamental aspect for the success of a CSS project concerns the motivations for CSs' involvement, but also – and above all – a deeper understanding of the factors that can contribute to maintaining such involvement during the project, also in the light of the expected personal and community outcomes (Nov et al., 2014).

2.1 YouCount: A CSS Project

The YouCount project (February 2021 – January 2024; https://cordis.europa.eu/project/id/101005931) aimed to co-create new knowledge and social innovations to increase the social inclusion of different groups of marginalized young people across Europe. The project partners are the Kaunas University of Technology (Lithuania), the Oslo Metropolitan University (Norway), the Deusto Foundation (Spain), the University of Vienna (Austria), the Aalborg University (Denmark), the nonprofit Environmental Social Science Research Group (Hungary), the University of Naples Federico II (Italy), the University of Central Lancashire (UK), the Sodertorns Hogskola Universtiy (Sweden), the Vetenskap & Allmanhet non-profit membership organization (Sweden), the University of the Church of Deusto Religious Entity (Spain), and the Spotteron Gmbh company (Austria).

To work towards its aim, the project moved within the methodological framework of CSS, gathering and training local groups of young people (aged between 16 and 30) as Young Citizen Scientists (YCSs), with whom to locally develop inclusive practices through the promotion of awareness and participatory development processes, creating opportunities to meet and exchange in order to generate or strengthen existing social networks among citizens and between citizens and stakeholders within a targeted community. Within project activities, youth social inclusion was meant as a dynamic and multidimensional process which attains to the opportunities and resources favoring participatory processes, but also the economic and political dimensions characterizing a specific social context (Butkevičienė et al., 2021; Procentese & Gatti, 2024).

Collaboration and co-creation of knowledge and social processes aimed at promoting social inclusion together with the involved YCSs were key elements in project unfolding (Ridley et al., 2023). Across cases YCSs were involved in several research stages: planning the unfolding of the local case studies, co-running preliminary analyses of local contexts through interviews and observations, co-analyzing such data, co-developing the activities to be carried out during the local cases (and co-facilitating group discussions, among such activities), co-creating strategies for involving participants or for showing them the results of the project.

Among the challenges that the research teams had to face during the implementation of the project (Butkevičienė et al., 2021), several issues related to the involvement of young people as CSs – specifically, in local research teams – arose. Some recurring themes concerned: how to maintain an open dialogue between researchers and YCSs, the need to observe and understand different levels of knowledge, the importance of knowing and encountering diversity to enable mutual recognition between different social groups, and how to maintain the interest, motivation, and commitment of YCSs and to value and understand how they will still be able to benefit from the results after the project.

3. Motivational aspects in CS and CSS Projects

A core element in CS and CSS projects concerns citizens voluntarily deciding to contribute to the resolution of problems encountered within their community context through their active

involvement in such projects, without being driven by economic interests (Haklay, 2013, 2015). However, differences between volunteering activities and volunteer participation in CS and CSS projects should be reckoned too: first, in CS and CSS projects citizens contribute to scientific research not only in the role of participants but also – and mainly – in the role of co-researchers (Cox et al., 2018); second – and consistently – in CS and CSS projects citizens contribute to knowledge creation along with professional scientists (Naqshbandi et al., 2023). Differently, volunteers usually engage in non-research activities and do not contribute to knowledge creation (they could at most participate as subjects in a study).

These differences may imply differences in their motivations, engagement, and involvement into these projects (Naqshbandi et al., 2023), which represent elements tightly interconnected in volunteer experiences broadly speaking (Peters et al., 2018). In light of this, and consistently with Omoto and Snyder's (1995) Volunteer Process Model (VPM), CSs' motivation to take part in the path of scientific knowledge co-creation stands as an aspect of great relevance, along with the factors that may contribute to maintaining such motivation and engagement over time (Lotfian et al., 2020; Nov et al., 2014).

Indeed, the VPM is aimed at better understanding why people engage in volunteer activities and keep their commitment towards them high, by meaning the involvement in volunteer activities as a three-phases process with reference to its antecedents, experiences, and consequences (Omoto & Snyder, 1995). That is, this model focuses on the factors bringing individuals towards the decision to get involved in volunteer activities, the characteristics of such activities in their experiences, and whether the intertwining of these two dimensions makes an intention to keep on volunteering stem. In the same vein, research has already acknowledged the tight link between motivational aspects and engagement also with reference to CSs (e.g., Naqshbandi et al., 2023).

Based on the distinction between extrinsic and intrinsic motivations (Deci & Ryan, 2012), Tiago et al. (2017) showed how mechanisms of extrinsic motivation can be more functional in the early stages of CSs involvement (e.g., in the recruitment phase); on the contrary, in order to achieve high levels of participation also in the long term, CS projects should leverage intrinsic motivations, which can be sustained through the project experience and the dimensions of relationality, reinforcement of skills, positive feedback, and flexibility in the modalities of participation, which should also be adapted to the needs of the involved citizens. Indeed, social dimensions such as positive feedback, teamwork, interactivity, and support within the reference group seem to favor the sustainability of CSs' sustained involvement and motivation (Iacovides et al., 2013).

Similarly, the model proposed by Nov et al. (2011) suggests that task granularity and levels of responsibility both represent aspects positively correlated with CSs' levels of motivation, raising the need to create dynamic environments allowing volunteers to start contributing to tasks of lower granularity and gradually progress to more challenging tasks and responsibilities within the projects (Nov et al., 2011); such evolution could also support intrinsic motivations related to the sense of responsibility and relevance of one's role within the project. Indeed, CSs' perception that their contribution is valuable and leads to relevant scientific results constitutes another key element to support CSs' motivation and to the maintenance of their involvement in the project over time (de Vries et al., 2019). Furthermore, the perception that the project one is

a part of is in line with one's own value tendencies can also be a further motivating and maintaining factor for involvement and commitment to the project (Levontin et al., 2022).

Despite the great relevance of this topic, to authors' best knowledge there are still only few studies investigating the motivational aspect of CSs, particularly with regard to CSS projects. Therefore, based on the acknowledgment that only a few studies deepened CSs' motives and how to sustain their engagement in CS and CSS projects, the aim of this study is to deepen the understanding of the factors contributing to or hindering CSs' short-term and long-term engagement and involvement in such projects, paying particular attention to the intertwinement of individuals' motivations towards and experiences within such projects (Omoto & Snyder, 1995; Peters et al., 2018). The above-mentioned YouCount project will be addressed as a case study.

4. Materials and methods

4.1 Participants and procedures

Interviews were conducted between February and March 2022 – that is, when the YouCount project was still ongoing yet YCSs had already been recruited and trained by local professional researchers for about a year, so that they could be able to deepen their experience as YCSs with specific reference to their short- and long-term motivations, engagement, and implications of their involvement.

As a preliminary step, project partners were contacted by the scientific responsible from the Italian research team – who led the study – to ask whether local YCSs would have been interested in taking part to this study; when they were, YCSs' personal e-mail contacts were provided by local professional researchers in order to send them the invitation to take part in the study and arrange meetings with them. One interview was administered online using the GoogleMeet platform, while the others were led in person during a project Consortium Meeting, where project partners agreed to invite some YCSs too according to CS principles.

Participants in the study were 9 YCSs (6 males, 3 females) aged between 16 and 39, from several local research teams being part of the consortium within the YouCount project: Spain, UK, Norway, Denmark, Lithuania, Sweden, Hungary. Due to language issues, it was not possible to interview a YCSs from the Austrian research team. Furthermore, since the study was led by the Italian research team along with Italian YCSs – who conducted the interviews – no Italian YCS was included as a participant in the study to reduce the risk of biases.

4.2 Tools

The semi-structured interviews addressed the following main areas: (a) YCSs' involvement and participation in the project over time (their recruitment, training, any motivational pitfalls and possible solutions); (b) participants' experiences and feelings as YCSs (their role, the activities they were involved in, their emotions, the relationships created and maintained within the local team and within the whole project); (c) the psychosocial impact of their

experience as YCSs (as to their commitment and engagement to their community of belonging, gender issues, any changes they reckoned in their community of belonging since the very start of the project, their knowledge and attitudes towards social inclusion issues, their informal dissemination about their experience as YCSs).

4.3 Data Analysis

Interviews were audio-recorded and transcribed verbatim. Texts were analyzes using the Thematic Analysis (TA; Braun & Clarke, 2006), whose aim is to identify patterns of manifest and underlying meanings and social representations of the investigated phenomena through the exploration of the contents and connections expressed by the participants and how they structure common sense thinking (Joffe, 2011). In order to make different meanings given to their experience as YCSs emerge, the TA was data-driven – that is, the emerged themes were strongly linked to the collected data.

The analysis was run according to Braun and Clarke's guidelines (2006). First, materials were read, and initial codes were to label the extracts. Then, the codes were grouped into potential themes and sub-themes, which were defined and labeled to clarify their meanings. The latter were discussed together to reach a consensus agreement among the authors.

5. Results

Six themes and thirty-seven sub-themes emerged; they are summarized in Table 1.

5.1 Initial Motivation for Getting Involved in a CSS Project

The first theme refers to youths' initial motivation for getting involved in a CSS project as YCSs, and the contents emerged specifically referred to different types of motives: (a) geographical proximity, (b) expectations of personal outcomes, (c) desire to make a difference, (d) curiosity towards new topics, and (e) project affinity with one's own values and interests.

Specifically, the emerged motivations can be categorized into extrinsic and intrinsic ones. As far as intrinsic motivations are concerned, the interviewees referred above all to the possibility of experiencing scientific and research processes – something they considered rare in relation to their everyday experiences but were curious towards. This is somewhat similar to the understanding-related motive identified by Omoto and Snyder (1995) in their VPM, which refers to volunteering activities allowing to acquire new knowledge and skills one is interested into. Furthermore, consistently with the *I create impact* profile as described by Naqshbandi et al. (2023), another motivating factor pushing them to become YCSs was the opportunity to make a difference in their own community, i.e., feeling an active part of it and in the role of promoting changes to improve individual and collective living conditions: "*you realize that you do not have to be a PhD student or a professional researcher to make a difference, and this feels good, and living my city, my territory, feels good too*" (F, 23, Denmark). They also point out that a further motivating factor was the recognition of an affinity between the project's central

Table 1. Summary of the emerged themes and sub-themes.

Themes	Sub-themes
Initial motivation for getting involved in a CSS project	(a) Geographical proximity
	(b) Expectations of personal outcomes
	(c) Desire to make a difference
	(d) Curiosity towards new topics
	(e) Project affinity with one's own values and interests
Factors promoting long-term commitment to the project	(a) Gamification
	(b) Responsibility-taking
	(c) Awareness-raising
	(d) Informal relationships
	(e) Professional researchers' ability to find solutions when needed
	(f) Affiliation to the project group
	(g) Economic rewards
	(h) Flexibility
	(i) Opportunity to travel
	(j) Personal outcomes
Risk factors undermining the motivation to remain involved in the project	(a) Communication issues
	(b) Lack of awareness about the value of one's contribution
	(c) Difficulties in reconciling one's own and project-related commitments
	(d) External stressors
	(e) Geographical distance
Experience as a YCS	(a) Recruitment strategies
	(b) Training
	(c) Activities carried out
	(d) Viewpoint as a YCS
	(e) Perceived usefulness of CSS
Impact of the experience as a YCSs on youths	(a) Self-efficacy improvements
	(b) Positive emotions and well-being
	(c) Feeling heard
	(d) Acquired skills for one's future profession
	(e) Acquired skills for one's personal life
	(f) Acknowledgment of gender inequalities
	(g) Knowledge about CS
Social impact of CSS projects	(a) Promoting interest towards the local community of belonging
	(b) Giving voice to youths
	(c) Producing changes
	(d) Creating connections within the community
	(e) Making gender inequalities visible

Note. CSS = Citizen Social Science; YCS = Young Citizen Scientist; CS = Citizen Science.

vision and their own values, interests, and skills, consistently with the value-related motive identified in the VPM (Omoto & Snyder, 1995): "*I believe YouCount goes in the same direction as I believe young people should be treated, get a role in society, see a better future; I believe YouCount is a starting point*" (M, 15, Sweden).

In relation to the more extrinsic motivations, however, many of the respondents report they joined in view of an expected personal outcome (e.g., an achievement in terms of curriculum or certificate of participation) or after considering whether the venue for project activity was if the venue was close to their daily life context and easily accessible for them – which was also mentioned in Naqshbandi et al. (2023) as a threat to motivation towards and engagement into volunteer research-based activities. Specifically, some of the mentioned personal outcomes stand close to the motives identified by Omoto and Snyder (1995) as career-related, such as enhancing one curriculum vitae or facilitating one's access to the job market.

5.2 Factors promoting long-term commitment to the project

The second theme addresses the factors promoting YCSs' long-term commitment to the project, with specific reference to the following aspects: (a) gamification, (b) responsibility-taking, (c) awareness-raising, (d) informal relationships, (e) professional researchers' ability to find solutions when needed, (f) affiliation to the project group, (g) economic rewards, (h) flexibility, (i) opportunity to travel, and (j) personal outcomes. Therefore, as suggested by Cox et al. (2018), the motivations partially change when moving from the initial to the retention phases, with the relevance of knowledge-related and value-based motivations decreasing in favor of personal development and self-enhancement ones.

A recurring element in the interviews is the importance of gamification, interactive activities, games, or computer simulations as aspects to keep young people interested and involved in the project. This stems consistent with the results from Moreno et al. (2015), showing that applying gamification mechanisms to volunteer activities can enhance volunteers' engagement in them. However, in this study participants pointed out that in the long term, these aspects need to be complemented by other elements in order to motivate YCSs to constant commitment: young people need to be made more aware of the importance of their contribution, of the individual and community impact of the activities in which they are involved, through the activation of individual and group empowerment processes – which sounds close to the personal development and community concerns motives identified by Omoto and Snyder (1995) as well as to the relevance of meaning-making processes in promoting volunteers' long-term engagement, as identified by Preist et al. (2014):

> "*I think the key is into two things: the first is to let them have fun, to let them enjoy the workshops, and the second is to let them keep the important things...if it is just fun, pizza, etc., they will not be interested because they will want to change, to do their part for a change, but if there is only the serious part and not the fun then they will leave anyway*" (M, 25, Norway).

In addition to these aspects, consistently with the *I connect with others* profile as described by Naqshbandi et al. (2023), other elements that can maintain commitment and active involvement in the project according to the participants concern the possibility of feeling part of something bigger than the individual commitment through the project. Indeed, through participation in project activities with the local research group or, in some cases, together with the international research team, all participants – including the YCSs – had the opportunity to establish informal relationships with peers or more experienced colleagues, broadening their perspectives through exchange with them and providing and receiving support when necessary, feeling part of the project community at last.

Related to this, another important factor that fostered participants' continued involvement was the professional research team's ability to find solutions to the problems that arose from time to time and to maintain flexibility during the unfolding of project activities to keep YCSs' engagement high (Naqshbandi et al., 2023), i.e., to accept that the YCSs' availability of time and commitment and their attitudes towards the addressed topics and activities were not homogeneous and stable. In this sense, rescheduling activities, and meetings when necessary was of crucial importance to avoid dropouts according to the participants: "*the researchers were met if the requests were not understood and reiterated the various steps in the scientific process and the activities to be carried out step by step if they were not clear*" (M, 15, Norway).

Extrinsic dimensions also emerged, such as personal outcomes, in this case not meant as the motivation for the initial adherence to the project but rather presented by some interviewees as an aspect that contributed to keeping their commitment high: "*I sometimes feel tired, but I know that at the end of the day the project has a positive outcome; I know what the result will be, and I want to achieve it*" (F, 39, Hungary). For instance, some partners decided not to issue equal participation certificates for all YCSs but differentiated according to their degree of participation; another example is the possibility of having their contribution acknowledged in the writing and publication of co-authored scientific and non-scientific articles or book chapters. Again, this seems consistent with the career-related motive identified by Omoto and Snyder (1995).

Another extrinsic factor referred to by participants is that some project partners were able to offer economic compensation of varying degrees to YCSs thanks to partnerships with the university or local associations. This was not initially foreseen by the project but was obtained during its implementation in some countries; it transformed the YCSs' completely volunteer participation into a partly paid collaboration. According to participants, this was an important incentive to keep motivation and involvement high, not because of the sum but because of the attribution of meaning and importance to the time and effort they spent on project activities.

Finally, some interviews revealed that the opportunity to travel (e.g., to take part in international project meetings, such as Consortium Meetings) was also an unexpected opportunity that further maintained participation in the long term.

5.3 Risk factors undermining the motivation to remain involved in the project

The third theme includes the risk factors undermining youths' motivation to re-main involved in the project according to YCSs by addressing different topics: (a) communication

issues, (b) lack of awareness about the value of one's contribution, (c) difficulties in reconciling one's own and project-related commitments, (d) external stressors, and (e) geographical distance.

In line with the significance of awareness and responsibility about the importance of one's own contribution and the individual and community impact of the activities to be carried out as factors maintaining YCSs' long-term involvement and motivation, the lack of awareness and understanding of these aspects appear as a factor that may undermine YCSs' motivation to keep being part of the research team:

> "*for me, it started slower as I did not understand what this time spent in this knowledge meant; maybe for a younger person it might be easier, but I did not understand many research items. Then, my involvement significantly increased when interviewing stakeholders and analyzing the data accordingly*" (M, 20, UK).

However, other factors were also identified as potential threats to maintaining the YCSs' involvement and motivation by the participants. Specifically, other risk factors recognized in all the interviews refer to the difficulty of reconciling one's own commitments (personal, work, study, etc.) and those envisaged by the project activities, especially in the initial phase, and to the impact that any external stressors (e.g., issues with time management) may have on the level of commitment and involvement in project activities, consistently with the results from Naqshbandi et al. (2023). These difficulties seem to be mitigated by greater organizational flexibility on the part of the local research team and, above all, by informal relationships with professional researchers and the other YCSs locally involved, as both aspects enabled better and more functional management and organization of the tasks to be completed, the materials to be produced, and the activities to be implemented. Again, this aspect is consistent with the relevance that flexibility and informal relationships had according to the YCSs as elements that favored high levels of involvement and motivation over time.

In the same vein, the participants referred that having communication issues within the research group – be them with professional researchers or with their peers – could have represented another risk factor for them keeping their motivation towards and engagement in the project high (Naqshbandi et al., 2023). Indeed, not feeling safe – that is, not feeling that one's ideas, values, needs, and beliefs can be expressed without being judged, or that it is possible to ask for help when in need (Pataki et al., 2023) – within the research group may have a detrimental effect on YCSs' involvement and motivation towards the project, making them gradually detach from it.

Lastly, a more extrinsic motivation emerged too. That is, participants reckoned the geographical distance from the venues where project activities were carried out as a factor potentially undermining YCSs' involvement in and commitment to the project, since such distance might make it difficult or time consuming for them to take part in project activities – even more when online meetings were not possible.

5.4 Experience as a YCS

The fourth theme unpacks participants' experience as YCSs, specifically referring to (a) recruitment strategies, (b) training, (c) activities carried out, (d) viewpoint as a YCS, and (e) perceived usefulness of CSS.

As regards to the recruitment strategies, participants report about several ones, with some countries using the social networks most widespread among youths of the targeted age, while some others taking advantage of the curricular timetable in local high schools or of previous collaborations with university students and locally active citizens (see also Ridley et al., 2023). In the same vein, professional researchers chose the most suitable methods and tools to train youths locally, even though a shared framework existed within the consortium (see also Ridley et al., 2023).

As to the activities carried out, the participants point out that their role as YCSs was not only related to the mere data collection, but rather enabled them to provide their perspectives to the research team and to see them valued by the latter; they also participated in the data analysis processes alongside professional researchers and were trained to get properly involved in scientific research and intervention procedures and in the use of different methodologies and tools to promote participative processes within the targeted communities (see also Ridley et al., 2022).

With respect to the experience as YCSs, participants highlight the enrichments stemming from the activities they got involved into and from how these made them feel – that is, finally heard and that their viewpoints were valuable – but also the difficulties, especially encountered in the initial phase, and the strategies they identified to face them over time:

> "*we did the Living Labs, I think two living Labs, in the meantime we held meetings in which we collected data and talked about how we could do things to gather more people, talked about problems around the ideas we were having or the changes we were making*" (M, 19, UK);

> "*in the beginning, it was not easy to involve people – no matter how young or mature – in learning about new topics, doing new activities, and being motivated to volunteer. What I tried was to come prepared to each meeting. I knew I was dealing with a wide range of people – from 14 to 16, at the beginning – and I had to attract attention, so that I could clearly portray a 'frame' of what the YouCount project was about*" (F, 39, Hungary).

Another important element of the experience as YCSs is the perceived great usefulness of CS in the social sciences, not yet widespread nor previously known by most participants, which after the implementation of the YouCount project was totally re-evaluated. Specifically, they reckoned the role their personal characteristics (e.g., gender, age, ethnicity) played in how they could come in relationships with other young citizens and the outcomes of such relationships:

> "*I think for me the most interesting thing about CSS is the type of data we have access to: it is not just about collecting it, or just doing charity to include young people, but it is*

about having access to different data than I would normally collect. As an adult male part of the white middle class in Norway, if I went to these neighborhoods to talk to teen migrants about social inclusions, I would not get the answers younger people get" (M, 25, Norway).

5.5 Impact of the experience as a YCSs on youths

The fifth theme deepens the impact of the experience as a YCSs on youths according to them. Specifically, the main elements compounding such impact were reckoned as (a) self-efficacy improvements, (b) positive emotions and well-being, (c) feeling heard, (d) acquired skills for one's future profession, (e) acquired skills for one's personal life, (f) acknowledgment of gender inequalities, (g) knowledge about CS, and (h) knowledge of one's community of belonging.

Consistently with the *I am a learner* profile as described by Naqshbandi et al. (2023), the most recurrent aspects concerning the impact of participation in the project as YCSs on the young people involved referred to the perceived increase in self-efficacy and more generally to the skills learnt – be them referred to their personal life broadly speaking or to their present or future foreseen professional one. The latter were detailed not only from a practical point of view (e.g., the ability to use new technologies), but also from a social and relational point of view (e.g., different perspectives and ways of thinking, ability to work in a team). Moreover, irrespective of the course of study undertaken or the profession pursued or desired, many participants also pointed out that among the skills learnt there were also elements that might be more broadly useful for their professional future, such as competence in project management, ability to interact with institutional and vertically asymmetrical figures or to facilitate group decision-making and participative processes:

"*even if you do not work in the field of social sciences, in all social contexts you have to work with people and co-create something as a team; in the end the social sciences are not so different from any other kind of knowledge in science, you need to be able to work in a team*" (M, 19, UK).

Furthermore, another element that, albeit unevenly, was mentioned as a skill acquired by the YCSs was the ability to read contexts from a gender equality perspective. Indeed, at the very start of the project, YCSs were not aware of the gender unbalances and dynamics they were embedded into due to their culture and social context of belonging: "*in my community, there is no exceptional equality as globally, women are often alone in taking care of their children, while men work*" (F, 39, Hungary). However, while progressing in project activities, they gradually became more aware about them and worked along with professional researchers to identify paths to make them visible to others and to promote perspectives based on greater gender equality (Pataki et al., 2023).

Other central aspects refer to dimensions more related to the emotional sphere, such as the positive emotions and overall well-being generated by active participation in the project and feeling listened to, as elements that made the experience as YCSs unique in reference to an

unmet need finally expressed through the project. Indeed, participants report how feeling that their voice had been heard by local stakeholders and institutions had made a difference as to their community-related well-being (Prilleltensky, 2005; Prilleltensky et al., 2014) as well as with reference to their feelings towards their community, making them feel less marginalized within it (Naqshbandi et al., 2023).

Lastly, cognitive aspects were also highlighted, linked both to a concrete greater knowledge of the territory and the community inhabiting it, and to the deepening of CS as a theoretical and methodological framework – previously unknown – that represents a potential strategy of involvement for public participation in the social sciences. As to the first aspect, working within one's community by taking an active role for its improvement allowed YCSs to further explore it out of their comfort zone, that is, to get to know people and places they did not know before getting involved in YouCount even though they had been living in that social context since years. As to the second one, participants reported they appreciated and enjoyed getting to know CS as a methodological framework and its implications in terms of public engagement and involvement.

5.6 Social impact of CSS projects

The sixth and last theme unravels the social impact of CSS projects according to YCSs, with reference to (a) promoting interest towards the local community of be-longing, (b) giving voice to youths, (c) producing changes, (d) creating connections within the community, and (e) making gender inequalities visible.

Indeed, the impact is first and foremost articulated as a greater interest in one's own community and its members, with reference to the importance of listening to others and of taking a critical look at the problems of one's own community, with the awareness of being able to do one's part to solve them and bring about broader changes. Furthermore, as it was mentioned in the previous theme, participants reckoned that another impact of their involvement in the project was them to get involved in identifying paths to make gender unbalances and inequalities visible to the broader community, and to promote perspectives based on greater gender equality through the activities planned and implemented along with the professional researchers. In this vein, they proposed this as an individual but also social impact of the project, since they reckoned this change in their daily life and adopted perspectives, but also as a potential impact on their communities through them changing personal attitudes and behaviors. Indeed, prompting changes in some elements of a social ecosystem can promote broader changes in the balances of the whole social and cultural system (Lewin, 1951; March & Olsen, 1989).

In line with this, participants highlight how their role in the project allowed them to giving voice to young people and promoting their more active involvement within the communities of belonging, also establishing an intergenerational dialogue when needed:

> "*in my community, how to involve young people is a big issue, because there is like an age bias, so the older people seem to tell other people in the territory that because they have more knowledge, they do not want to hear their voice, as if having lived their whole life in*

that territory they already know everything. Youth involvement is small, and that is why we do not have a youth group, I do not know if anything has changed but we are working on this, to make them feel heard; they have something to say too, so we spend time in the parks and we can say where we feel included and where we do not. We are asking the high school kids "what would you like?" but the real problem is who would facilitate it, even if K. or I do it, we would need more people to do it" (F, 23, Hungary).

However, they also reckon the need for a stronger local social network among stakeholders, so that more human resources can be mobilized to manage the produced social innovations when needed.

In some cases, moreover, participants in the interviews pointed out that the quality of interpersonal relations in their community had also improved, probably as a secondary benefit resulting from the greater opportunities for involvement and dialogue, greater participation and greater interest promoted in relation to issues and questions felt to be common (e.g., Donati, 2014; Uhlaner, 1989).

6. Discussion

CSS defines those scientific projects within the field of social sciences and humanities in which non-professional researchers – that is, citizens – get involved in processes and activities along with professional researchers (Albert et al., 2021; Göbel et al., 2022). As these projects mainly rely on the volunteer collaboration between citizens and professional researchers (Haklay, 2013, 2015), CSs' motivation towards such involvement represents a critical issue for their success, as well as the factors that can contribute to maintaining such involvement during the project (Nov et al., 2014). However, as outlined above, to authors' best knowledge only few studies addressed these issues with specific regards to CSS projects.

Therefore, the present study deepens these aspects by addressing YCSs' perceptions about them and about their experience as CSs during the above-described YouCount project. Indeed, based on Omoto and Snyder's model (1995) about volunteering experiences, the antecedents and the consequences of such kind of engagement should be addressed along with individuals' experiences with regards to that. In order to properly deepen all the above-mentioned aspects, the study was led when participants had already been YCSs in such project for more than a year.

As to their experience in the role of YCSs, participants detailed how they were recruited and trained across local research groups and the different activities in which they were at different extents involved. Furthermore, they reported that their role as YCSs in the project made them feel that their viewpoints were valuable and worthy for the project unfolding as well as for their communities, and that CSS was a powerful tool to promote citizens' more active participation in local processes and for common aims. Therefore, both the experiences and the meanings YCSs attributed to them were deepened, consistently with Omoto and Snyder's VPM (1995). As to its antecedents, moving from participants' answers, the motivation towards becoming a CS in a CSS project was unpacked in initial motivations for getting involved, factors promoting the long-

term commitment, and factors undermining the motivation to remain involved in the project (that is, risk factors for maintaining the motivation and involvement). As to the consequences of the experience as a CS, in the same vein they were split into the impact participants reckoned on themselves and the one they identified on the targeted social contexts and communities, with participants somehow tracing the two dimensions of external and internal relational good suggested by Mannarini et al. (2018) as to social added value (SAV) – that is, the benefits stemming in terms of relational goods that affect project members' and beneficiaries' well-being (Dietz et al., 2012; Donati, 2013, 2014).

On the one hand, as to the antecedents (Omoto & Snyder, 1995) of the experience as a CS, it is to mention that both intrinsic and extrinsic motivations (Deci & Ryan, 2012) stemmed both as to participants' initial involvement in the project and as to them maintaining it over time. Several motives at both stages were in line with those identified by Omoto and Snyder in their VPM (1995), yet the present study also shows the relevance of other dimensions when it comes to involving youths in CSS projects. Consistently with Cox et al. (2018), the present results suggest that the motives and their relative importance can vary based on the stage of the involvement process. Specifically, the intrinsic factors were felt as more relevant at both stages by participants, differently from what was suggested by Tiago et al. (2017); however, they differed across stages. Indeed, when talking about their decision to become a YCS, participants mostly referred to them seeing their role in the project as an opportunity to do something to improve their community and make a difference in it (community concern motives, Omoto & Snyder, 1995), since they reckoned that the project and their own values were aligned (value-related motives, Omoto & Snyder, 1995); another current motive referred to their curiosity and desire to learn more about scientific processes and their unfolding (understanding-related motives, Omoto & Snyder, 1995).

Differently, when it came to maintaining their involvement over time, great relevance was attributed to them being aware of the relevance at both individual and community levels of the work they were carrying out and feeling responsible for its success (personal development and community concerns motives, Omoto & Snyder, 1995) – consistently with Cox et al. (2018). Conversely, not being aware of the value of one's contribution was reckoned as a factor undermining their motivation towards the project over time. This stands consistent with previous studies (Nov et al., 2011; de Vries et al., 2019) suggesting that higher levels of responsibility and being aware of the relevance of one's role within the project might represent elements supporting CSs' long-term commitment. Moreover, another element protective for CSs' long-term engagement was linked to relational aspects (Iacovides et al., 2013; Tiago et al., 2017). Indeed, their feeling of being part of the local research group: this was through the informal relationships established – both horizontal and vertical ones – but also through professional researchers' availability to find solutions together with the YCSs to meet their needs when needed. Indeed, when the did not happen, the risk of YCSs leaving the projects due to the difficulty of reconciling their own commitments (personal, work, study, etc.) and those envisaged by the project activities was higher according to participants.

On the other hand, as to the consequences (Omoto & Snyder, 1995) of their experience as a CS, participants mainly mentioned the impact in terms of enhanced self-efficacy and skills learnt – be them personal or professional. That is, they reckoned that volunteering in a CSS

project in the role of CSs allowed them to acquire technical as well as relational skills, to feel more confident in playing out several tasks, to understand how to manage different kinds of relationships. Furthermore, they also reckoned that their role also allowed them to achieve more knowledge about both CS principles and the characteristics and dynamics shaping the targeted communities – which often were their own. Overall, this was linked to them feeling good and experiencing positive emotions with reference to their experience of involvement in the project. Moreover, the interviewees also reckoned the impact they had had on the targeted communities through the activities they got involved into during the project. Three main domains emerge with reference to this: (a) promoting awareness (about community issues but also about gender inequalities); (b) giving voice and producing changes; (c) fostering local relationships and social capital. Therefore, the interviewees felt they had been "catalysts for promoting community change" (Hyde & Chavis, 2007, p. 179).

Altogether, what emerges from this study allows to better understand which are the specific motivations for youths to get involved and maintain their commitment in a CS project when it refers to the field of humanities and social sciences, but also which outcomes can stem for them and for the beneficiaries of such projects. On the one hand, this can be relevant for professionals aiming at developing this kind of project, since keeping CSs' commitment high for the whole duration of the project can represent a challenge to be faced within them (Butkevičienė et al., 2021). On the other hand, this can also be meaningful when it comes to making CSs aware of the relevance of their role and contributions. Indeed, showing them that the activities they can be involved into will have an impact at different levels could provide them with a stronger vision about the transformative power they could have in fostering changes of the cultural, social, and political systems they are embedded into (Albert et al., 2021; Kythreotis et al., 2019).

6.1 Limitations and future directions

The results of this study provide further insights into the antecedents and individual and social consequences of taking part as a CS in a CSS project. It should be mentioned that the YCSs involved were only a group of those being part of the YouCount project – that is, those who agreed to take part in the study – and that the results are to be understood concerning the specific social and work context of the project, as well as with reference to the characteristics and main topics of the. However, despite these limitations, the present research meets transferability criteria (Guba, 1981) and provides meaningful insights.

Furthermore, it is to mention that the interviews were carried out during the project implementation. However, a few YCSs initially took part in the project but dropped out in the first stages of its implementation; therefore, it was not possible to reach them and interview them when the study was carried out. This may explain why most of the difficulties emerged from interviewees' words refer to motivational aspects, but not to other experiences within the project – that is, those experiencing different difficulties just left the project.

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