Integrating Diverse Perspectives: Meaning-Making Process in Participatory System Dynamics

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Participatory Modelling is a distinct approach in the field of System Dynamics, aiming to include stakeholders in a formal process of model development. Scholars have investigated the micro-level interactions between stakeholders and explored how those arrive to common meanings and coordinate further action. We delve deeper into this question from a Meadian and neo-Meadian social theoretical perspective and find that GMB can be considered a symbolic meaning-making activity entailing perspective-taking between participants. Symbols are proposed by the stakeholders and represented as object/variables which are constantly expanded and enhanced with the perspectives of other members. This process leads to the coordination of participants' perspectives and allows for the emergence of possibilities for action that may have not been imagined before. We also explore how the different social positions that participants occupy can become central during their interactions, and observe that conflicts can emerge due to the failure to identify being in the position of the other. Based on our findings, we propose that practice can benefit from decentring (transient) positions that may impede participants' ability to take the perspective of the other toward themselves.

Introduction

System dynamics (SD) is a modelling methodology applied in various (inter)disciplinary fields studying complex, dynamic systems. Highly problem-oriented, its proponents seek to understand the behaviour-over-time of complex problems by modelling the underlying system structure. Participatory Modelling "is an approach for including a broad group of stakeholders in the process of formal decision analysis" (Stave, 2010, p. 2766), utilising their knowledge to generate "formalized and shared representations of reality" (Voinov et al., 2018, p. 233). Within the SD field, Participatory SD became a distinct approach with the emergence of Group Model Building (GMB) (e.g., Andersen et al., 1997; Richardson & Andersen, 1995; Vennix, 1996; Vennix et al., 1993). GMB refers broadly to a process in which a diverse set of problem owners share their mental models concerning a problem, and collectively represent its underlying structure in a causal map. This map can then inform and/or validate the conceptualisation of a formal simulation model for hypothesis testing and policy analysis (Hovmand, 2014; Király & Miskolczi, 2019; Vennix, 1996).

GMB produces "a range of cognitive and interpersonal outcomes that are considered beneficial to group decision processes" (Scott et al., 2016, p. 913). While there are evidence as to the method's effectiveness, valid conclusions are provisional "unless we open up the black box and record in more detail what exactly happens during group model building interventions" (Rouwette et al., 2002, p. 26). This call to open up the 'black box' of participation and explore "the micro processes at work in model construction at the individual and group processes" (McCardle-Keurentjes et al., 2018, p. 24) has since been answered by various scholars seeking to increase understanding of and improve GMB practice. Black and Anderson (2012) and Black (2013) explicitly relate the visual representations inherent in SD models to the sociological construct of boundary object – a "tangible representation of dependencies across disciplinary, organizational, social or cultural lines that all participants can modify" (Black & Andersen, 2012, p. 195). Their work highlights the ability of GMB to integrate diverse perspectives within a stakeholder group to achieve "shared meaning-making" (Black, 2013, p. 85). Zimmermann et al. (2015) have proposed the application of Mead's (1934) social theory to further investigate meaning-making in participatory processes. They contend that participants *gesture* by expressing their subjective experiences and knowledge, which enables them to "participate in the experiences of one another" (Zimmermann et al., 2015, p. 4). In turn, they respond to others' gestures by relating it back to their own knowledge before *naming* a concept and proposing dependencies. Through mutual feedback of adjustments to interpretations, "participants create significant symbols that allow them to mentally simulate the consequences of proposed dependencies and to *act in an orchestrated, shared way* instead of independently" (ibid., p.5). Their work thus describes the individual processes of meaning-making within the participatory process of GMB at a higher level of abstraction –the group level. In doing so, they do not delve deeper into how exactly the alignment process occurs at the micro-level and how those lead to the construction of the causal map as a significant symbol. Scholars in the field of Operational Research have been focusing precisely on *what actually happens* at micro-level interactions amongst participants. Drawing on communication theories, Tavella and Franco (2015) analyse micro-level "conversational exchanges" in a modelling workshop to identify various communication patterns that affect knowledge production (p. 452). Franco and Grieffenhagen (2018) explore ethnomethodology as an analytical approach to "reveal the ways in which OR-supported activity is practically accomplished by those involved, *moment by moment*, and with what effects" (p. 674). They emphasise the significance of micro-level interactions in contributing to the "attainment of intersubjective alignment" amongst participants in participatory modelling environments (ibid., p. 681).

Like Franco and colleagues, we seek with this research to examine the micro-level intersubjective interactions between stakeholders during the GMB process – specifically, to understand *what actually happens* during the alignment process through which participants arrive at shared meanings, and its implications for GMB practice. We embark on this exploration by grounding ourselves on Meadian social theory (Mead, 1910, 1922, 1934), inspired by the conclusion of Zimmermann et al. (2015) that such a framework provides a theoretical lens to understand "how individuals in a group process construct new meaning and thus change their thinking, which can contribute to consensus, commitment and system change" (p. 8). We further enhance the current scholarship on Meadian perspective in Participatory SD (e.g., Zimmermann, 2017; Zimmermann et al., 2015) by extending the theoretical base to include elements emphasised by neo-Meadian

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scholars (Gillespie, 2012; Gillespie & Martin, 2014), which we believe present opportunities for GMB, practice – especially in the presence of conflictual meanings and perspectives between stakeholders participating in the activity. In doing so, we further contribute to prying open the black box of participation in GMB.

In this paper, we begin by briefly describing the Meadian and neo-Median theory that frames our analysis of micro-level stakeholder interactions before delineating the methodology employed. After which, we present the key findings from our analysis that shed light on the meaning-making process during systems mapping. Lastly, we discuss the implications of our findings to SM and GMB practice and explore opportunities for further research.

Theoretical Framework

Mead's theory views reality as perspectival, characterised by the "dynamic, ongoing interrelation of individual and environment" (Martin et al., 2008, p. 298). Perspectives for Mead are not entities residing somewhere in the individual's mind but rather, represent very real *orientations to action* towards one's environment (Martin, 2005). Mead stresses that analytical thought only emerges out of the presence of conflicts in our conduct. During episodes of a "perfection of adjustment" with the world, awareness of the meaning of objects and actions is lacking; rather, it is only when an object gives rise to "conflicting tendencies of action" (conflicting perspectives) that we gain consciousness of meaning and can begin our search for new meanings that may resolve our conflict Biesta (1998).

Importantly, for Mead, such consciousness of meaning can only emerge in social conduct involving subject-subject interactions. One of the central concepts of Mead is the *social act* which entails the interaction of multiple forms and "the adjustment of the conduct of these different forms to each other, in carrying out the social process" (Mead, 1934, p. 45). This adjustment of conduct is made possible by means of *gestures*, "movements of the first organism which act as specific stimuli calling forth the (socially) appropriate responses of the second organism" (ibid., p. 14). Social conduct is thus a *conversation of gestures*, where consciousness of meaning emerges as we become "conscious of interpreting the gestures of others by our own responses or tendencies to respond" (Mead, 1910, p. 403). This interpretation is, however, not enough. Consciousness requires that actors "take the attitude of the other in responding to their own gestures. In this way they begin to import into their conduct the social significance of their own gestures" (Cook, 2006, p. 74). Significance is an important term for Mead, and a *significant symbol* is a symbol that calls out the same attitude (or perspective) towards it to the individual making it as it calls to others that participate in the social act; "It stands for the ideas in the minds of both of them" (Mead, 1934, p. 48). In this way, it allows the individual to become conscious of the others' perspectives towards it, thus enabling them to adjust subsequent behaviour more effectively during the conscious conversation of gestures.

The acquisition of significant symbols in social interaction emerges, for Mead, in situations which facilitate our ability to take the perspective of the other and thus become other to the self. Situations such as games and role-play allow us to experience being in the actual position of the other and, from the experience of being "the other", take the perspective of the other towards the self. For example, when changing positions within a

game of soccer from goalkeeper to scorer, we are able to experience the different responses that are associated with those positions. If these perspectives become integrated, evoked at the same time during our conduct, they can direct our further conduct (Gillespie, 2005). Those ideas are further explored by neo-Meadian scholars under Position Exchange theory (PET).

Position Exchange Theory

PET (Gillespie, 2012; Gillespie & Martin, 2014) begins with the understanding that we occupy different *positions*, different locations in the world, whether those are physical, psychological, social, or symbolic (Glăveanu, 2018, 2021). Those positions can be transient (e.g., speaking) or relatively stable (e.g., being a student, being a woman). What is important is that, for each social position, there is an interdependent social position – for example, for one to be a speaker, there needs to be a listener, for one to be a student, there needs to be a teacher, etc. Moreover, each social position is considered as sustaining a perspective, "an orientation to an environment that is associated with acting within that environment" (Martin, 2006a, p. 67). In this sense, following Mead, perspectives arise from our interaction with the world and guide our conduct in the world.

The main tenet of PET is that, as people move between social positions (from speaker to listener or from student to teacher), they experience first-hand the situation of the other, and this allows them to "'layer up' psychological perspectives and discourses, thus becoming dialogical beings" (Gillespie & Martin, 2014, p. 74). Gillespie (2012) provides the example of a gift-exchange where participants alternate between the positions of giving and receiving presents, thus integrating the two perspectives and "give from the standpoint of receiving, and […] receive from the standpoint of giving" (pp. 41-42). Another frequently discussed example is that of play and role-play, where children may take the position of the mother towards a doll, or alternate between positions of "hiding" and "seeking" (Gillespie, 2005; Gillespie & Martin, 2014; Martin, 2006b) In all these situations, through the exchange of positions we develop self-consciousness and agency (Martin & Gillespie, 2010) by "becoming other" (Gillespie & Martin, 2014, p. 78) to ourselves. This allows us to "coordinate our actions with those of other people and come to understand them better. In essence, we build common ground and become able to take perspectives and develop empathy" (Glăveanu, 2021, p. 38).

Method

A total of two Systems Mapping (SM) workshops were conducted to collect primary data for examining the meaning-making process during stakeholder deliberation. The SM workshops took place as part of the course *GEO-SD304: System Dynamics Modelling Process* offered in the autumn semester of 2021 by the System Dynamics Group at the University of Bergen, and were conducted within one week of each other. A total of 17 students took part in the first workshop, and were allocated the roles of *facilitator*, *modeler*, or *stakeholder*. Facilitators and modelers received further information on how to perform their role and were provided with a detailed facilitation script, which was adapted from the *Initiating and Elaborating a Causal Loop* Diagram script (Vennix & Rouwette, 2018). Stakeholders, who were to role-play a certain fictional character, were each given further background information to cast their persona. The Personas were

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adapted based on earlier versions developed by Andrew Dwight Brown and Anaely Aguiar Rodríguez. For the second workshop, 14 participants returned for the session, maintaining their assigned role and persona. The workshop started with the presentation of the causal map that was developed in the previous session. After which, stakeholders were given the opportunity to renegotiate (e.g., remove, add new, or merge) the variables and connections in the map, and expand specific areas of the map.

To examine stakeholders' meaning-making process, qualitative data was collected by audio recording (with informed consent) the GMB workshops for each group. The recordings were subsequently transcribed into texts for analysis. We then broke down the transcripts into "topical episodes with a clear beginning and end" (Haapasaari et al., 2016, p. 240). In general, each episode starts with the introduction of a variable or concept that spurs a discussion centring on a certain topic and ends with the final codification of variables related to that topic in the causal map. At times, the topic at hand gets decentred from the discussion only to re-emerge again at a later time. In those instances, the episode is stitched together with excerpts of relevant discussion. We then selected a single topic, namely *food choice*, for deeper analysis since it was common between all groups and provided rich data on conflictual moments between stakeholders.

Discourse analysis was then conducted for each episode. Discourse analysis is a qualitative, interpretive method that analyses text not simply for its content but also for "its relation to its context, the intentions of the producer of the text, [and] the reaction of the intended audience" (Hardy et al., 2004, p. 20). More importantly, such analysis is "concerned with the development of meaning and in how it changes over time" (ibid.), which is precisely the objective of this study. In each episode, the unit of analysis is a speaking turn – both in isolation and in relation to the episode (Haapasaari et al., 2016). Each speaking turn, in isolation, contains the gesture of the speaker. However, to interpret the meaning of the gesture, we read into the text the speaker's position and perspective (context) as well as that of the speaker's intended audience within the episode (be it someone they are addressing or responding to). The goal of the analysis is to explore how meanings related to the topic is negotiated between participants and trace how those meanings change over time as participants attempt to codify them in the causal map. In doing so, we hope to glimpse into the meaning-making process in GMB.

Analysis

Systems Mapping as a Meaning-Making Process

SM is both a symbolic activity, in the sense that participants use language (symbols) to communicate their ideas and, simultaneously, an object-mediated activity. Objects in SM are the tangible, on paper, representations of variables. The very process of SM is that of transforming symbols (words, concepts, ideas) to objects (variables, links) that contain the symbols and thus gain a symbolic value (act as symbols) within the activity. Another class of objects are the physical arrows that are drawn to connect those variables representing the causal links/relationships between them. Causal relationships are important in that the meaning of an object-variable is found in its connection to other object-variables. For instance, in the connection where more healthy food consumption decreases obesity, the meaning of "healthy food" lies in the benefits of such consumption

that could positively affect one's body mass. However, the meaning of healthy food is also the action of its the choice – i.e., what produces the choice of healthy food in contrast to unhealthy food? To illustrate, we provide an example in which a stakeholder presents a variable that can affect the problem at hand (obesity):

> **Parent:** I think the most important for me is definitely eating habits. So, the reason is, eating habits used to be different when I was a kid, but, right now, for my children it is a lot different. We used to eat a lot of home cooked meals then and now people eat outside a lot of time […] so eating habits changed a lot and that is the major cause, I think, for obesity.

The object-variable "eating habits" that the parent brings forth, enhances the object "obesity" by adding to it the causal connection from "eating habits". Importantly, it symbolises the parent's perspective emanating from the positions they occupy (e.g., what they used to eat as a kid, what they are feeding their kids as parents). In this sense, it can be viewed as a significant symbol, representing "the entwining of both the perspective of self and other into a single meaning" (Martin & Gillespie, 2010, p. 257). It is however not necessary, in terms of the here-and-now of the specific social act of the modelling process, that such a symbol integrates the self/other perspectives *within* the group. In any case, it triggers the meaning-making process as stakeholders adjust their perspectives in response. In the others' responses, the meaning of the gesture emerges, oftentimes seemingly in accepting the symbol as significant for the here-and-now, and oftentimes not.

We now provide an extended example of the process through which symbols may become "increasingly significant symbolic" (Gillespie & Zittoun, 2010, p. 54) in the SM process. Prior to this episode, the group has identified Price as a constraint to Healthy Food Choice. In this process, they have expanded the object/symbol 'healthy food': *healthy food is more expensive than its counterpart (unhealthy food)* and it is this characteristic that acts as a constraint to its Choice. The facilitator attempts to ensure that all participants agree.

> **Principal**: Partially... […] For me it's also... and also I'm a high school principal and what I see in my students is also that they need, like, a quick... quicker solution to get something to eat.
> **Highschool Student**: Easy to go buy some junk food from the store and... It's nice to enjoy once in a while.

For the principal, Healthy Food Choice is not constrained only by Price, but also by *convenience*. Importantly, the perspective on food choice that they present seems to emanate from their position as a school principal observing the students' behaviour and attempting to take their position. The student indeed confirms, and they both share the perspective that *healthy food is less convenient* than unhealthy food. This triggers the adjustment of the perspective of the farmer:

> **Farmer**: …oh, it doesn't only depend on price.
> **Principal**: Doesn't only depend on price.
> **Farmer**: Well, it also... depends on… how you see this. Yeah.
> **Principal**: Yeah, but price is a factor of course.

Here, we see a coordination of perspectives with the farmer explicitly acknowledging that the meaning of Food Choice includes but is not limited to the Price Of Healthy Food. They recognise the dissimilar perspective evoked in the principal due to their differing social positions, and this allows for the enhancement of the symbol Food Choice with this perspective. Interestingly, the supermarket manager enters the conversation with a potential course of action, proposing to rearrange the display of food items in the store such that healthy food is located at the front of the store, and unhealthy food is moved away from easy reach. They gesture, "And it will take them more time to look for junk food in the rear of my shop." The supermarket manager seems to attempt to take the position of the consumer in order to produce an appropriate response, a solution to the proposed constraint (convenience). Under the seller/buyer dyad, the meaning of 'convenience' is 'time to buy something' and, as such, placing unhealthy food out of reach will alleviate the convenience constraint for healthier food.

> **Principal**: […] when I go to the store, I usually have my shopping list and if junk food is on there, then I will buy it no matter where it is in the shop.
> **Student**: Yeah. Sorry, as long as junk food is available and it's the quick fix, that's probably what we'll go for in the shop

Here, the perspectives of both the principal and student contest the seeming conflation of *visibility* and *convenience* by the supermarket manager. "Quick fix" has a different meaning when viewed *only* under the buyer/seller dyad, and a different one from other positions the consumers occupy (e.g., as workers or students). For these positions, "quick" refers to the time from purchase to consumption:

> **Parent**: […] healthy food is not always already prepared to eat, and sometimes you have to cook it. Parents don't have time to cook…junk food is the solution

'Healthy food', as symbol-object, is again enhanced: *healthy food requires more preparation and is less convenient as such*. It is precisely this emergent meaning that is now challenged by the farmer and supermarket manager who seem to share a similar perspective from their common position as sellers. They convey that healthy food need not be time-consuming to prepare, rather it is the lack of awareness about how easy it is to prepare such food options.

> **Farmer**: Then it just comes to education again…if you educate on how much delicious food you can make from fresh vegetables.
> **Student**: But then you have to make this.
> **Farmer**: But it doesn't really have to take that much time. It's about prioritising the right things during the day.
> **Principal**: But it takes more time than eating junk food, and we have enough responsibilities.
> **Farmer**: Yeah, but don't we have the time?
> **Principal**: No, no, I don't feel that we have the time.

We have seen in the above episode participants sharing and mutually adjusting their perspectives. This allows for the clarification and thus expansion of symbols by the different perspectives that are present in the room, and which emanate from stable positions the participants occupy. Healthy food choice is expanded to include the

constraints of price and inconvenience. Subsequently, inconvenience as a constraint is expanded to not including visibility but include time for preparation. As the symbols are enhanced through the integration of different perspectives, as they become increasingly significant symbolic, they now allow for the emergence of new possibilities of action: from changing food placement in the supermarket to educating people on how to quickly make healthy food. While this particular discussion is far from over for the group, it represents how the perspectives of the participants lead to the enrichment of symbols in the here-and-now of the participatory modelling process and towards the path to significance. It further exemplifies how such enrichment is necessary for new 'solutions'; new possibilities for action.

Stable and transient positions and their role in the Meaning-Making process

As Mead notes, the meaning of an object or a gesture is precisely our tendency to respond to it, and there are numerous responses that can be evoked by a gesture or symbol (1934). Therefore, in social interaction, the response chosen of all the possible ones as the meaning of a gesture is part of the mutual adjustment of participants. In what follows, we attempt to look a little deeper into what can the emerging meaning of a gesture be, not only in terms of the symbols discussed in the previous analysis, but also in terms of such a mutual adjustment of interlocutors' perspectives that emanate from both the stable and transient positions they occupy within the social act. In the episode:

> **Policymaker**: […] If we can make sure that we have a healthier lifestyle within our population… we would not have to pay as much for [healthcare costs of] other people, meaning we can spend more on building better schools, for example
> **Parent**: Yeah, but what about the cost of … there are some people that cannot afford to buy healthy food because in the supermarket there are a lot of… the prices are really high. And so they rather prefer to go for cheaper stuff. So why you're not about…?

There are multiple potential responses, multiple possible meanings of the policymaker's gesture, all to be found in the tendencies of the parent to respond: there is, for example, the possible meaning that centres on the object 'healthy lifestyle' and places it under scrutiny to make its characteristics more visible (e.g. "What is a healthier lifestyle?"); there is a possible meaning that centres on a solution (e.g. "schools can help with a healthy lifestyle"); and so on. But the real meaning of the gesture, the one chosen from all potential meanings, seems to respond to the idea of 'healthy lifestyle' as (the population's) *responsibility*. Why then, within the current interaction, is this meaning of responsibility chosen for the gesture? Perhaps the parent's response represents an adjustment to the phrasing "within our population" which implies their conversational partner is speaking from their position as policymaker, thus centring the conversation around the dyad policymaker/constituent. The parent, assuming the position of a constituent, choses to bring forth the problematic of fulfilling their responsibility of having a healthier lifestyle, namely *cost as a constraint*. What can also be observed here is that the parent counters being positioned as the one responsible by putting the supermarket in that position instead – an attempted repositioning of the one responsible for unhealthy lifestyle.

> **Supermarket Manager**: Yeah, but there's nothing much I can do […] I have to pay the rent and pay the salaries so… well… What should I do?

The Supermarket Manager also responds to the idea of responsibility, solidifying this meaning that the parent proposes. They bring to the front responsibilities that are associated to their own position as a seller and business owner and identify with the parent's perspective of costs as constraints to fulfilling their responsibility. Despite shared meanings, the different positions the interlocutors occupy within the same institutionalised social act (buyer/seller) imply different situational demands in relation to the issue of cost of food– and, moreover, demands that contradict each other in terms of their actionability. The parent's proposal is 'cost of healthy food needs to be lowered (for me to take the responsibility)', the manager's is 'cost of healthy food cannot be lowered (because I also have responsibilities)'. The policymaker breaks the possibility of expanding on the common perspective (between parent and supermarket manager) towards cost as a constraint to action:

> **Policymaker**: People have the right to pick whatever food they want. So you can't just tell them what they can and cannot eat. That goes against their liberties

While they now share into the meaning of responsibility as well, they introduce the concept of "(free) choice" and utilise what they may perceive as a(nother) significant symbol: "liberties." It can be speculated that 'liberties' conveys the meaning of a right and a responsibility for all citizens. From their position as a policymaker, they seem to gesture that "(free) choice" (which is perhaps their own responsibility to protect) means the *lack of imposing restrictions.* The supermarket manager also agrees with this meaning: choice implies for both the same disposition to act, or rather *not* act to restrict this choice. Interestingly, the parent accepts their meaning but, from their position, reject the very applicability of the symbol "choice" which, again under our interpretation, stands for them being accused as having the responsibility for a healthy lifestyle:

> **Parent:** At this point I can add the money to afford healthy food because I don't really have a choice so I can add it here […]
> **Policymaker:** Still have the option to buy the healthier food.
> **Parent:** What if I don't have the money to buy the healthier food? […] I mean, if I want to buy a salad in your supermarket, it's like €6.00 and if you take the … the hotdog thing, it's like €3.00. So come on!
> **Supermarket Manager:** But I still have to pay rent! So I can't give it for free.
> **Parent:** Yeah, but you can't… Just put yourself…. I don't need to pay the rent?

Here, the parent seems to invite the manager to their position by providing with a rather embodied example of how cost (that they view as emanating from their actions as seller) constrains their actions as buyer. The manager responds to this by exposing how cost constrains their own action. Again, the constraints are not debated; what seems to be debated is the responsibility. Interestingly, the parent's vocal gesture "just put yourself in my [shoes, position]" seems to act as a stimulus for taking themselves the perspective of the manager: "I don't need to pay the rent?".

We choose this episode as it represents to us an "accusation game" where what is really negotiated is responsibility, whether the participants are conscious of this or not.

While there is disagreement, this meaning is, according to our reading, shared. This shared meaning, moreover, acts as a basis for them to share an additional aspect they have in common, namely that costs constrain their actions. If the parent and the supermarket manager are facing the same constraint, if they speak from the same position as buyer (of food/of rent), then there is a ground to build on – there is the possibility for taking the perspective of the other because they *are*, with respect to this position, in the position of the other. A possible reason that this potential is not realised is that, despite sharing positions as both buyers and as someone with responsibilities, the participants are also occupying the transient positions of accused/accuser, which somewhat "trap" them in not exploring their shared meanings. Those positions, which may have been here centred partly due to 'responsibility' as the meaning (i.e. action orientation) of this social interaction (what can or should one do from one's position as buyer/seller), made their differences in perspective not only visible but, in a sense, unavoidable, leading to a "closing down" of the possibility of being, or rather, recognising that they are in the perspective of the other.

One of the reasons we hypothesise that the transient positions of accuser/accused may be crucial is that the parent and supermarket manager were able to share the above described meanings at a later stage of the SM workshop. While returning to this highly contested area of the map, they acknowledged their shared meaning of cost as constraint, and the lack of choice they are both faced with. In this case, as the participants had continued building the causal map and representing other elements related to choices in the production, distribution, and marketing of unhealthy food, the positions from which they were speaking seemed to change. Specifically, the supermarket manager de-centred from their position as a seller and business owner and re-centred to the position of a (wholesale) buyer. This allowed them to acknowledge elements of how a buyer's choice is constrained and how this can be true for a retail buyer as well (here, the parent). We believe that this was possible because of the transient positions of accused/accuser losing their visibility when participants returned to areas of the map that had been enhanced with further adjacent object-variables. This is a benefit of the practice of SM, in which variables can be represented without a necessary resolution of a conflict. As the participants return to the variables later, they may "start over" the discussion from a point where different position(s) are centred.

Focusing on the practice of facilitation, we view episodes such as the one described above as presenting with an opportunity to invite participants to become conscious of the same meaning that we, as external observers, are conscious of in their interaction. We view this episode as representing a "*surplus* of meaning and understanding" (Glăveanu, 2019, p. 435) between the participants, rather than a lack of it. Indeed, participants here share the meaning of responsibility, of costs as constraints, and of the need to act to alleviate the problem, even if they do not share a same understanding of what may be feasible actions for this purpose. We suspect however that, as we see here, participants may be unaware of this surplus. Facilitators or other members of the modelling team could act to draw attention to it. What PET can contribute with is the view that perspective-taking, as a movement "out of their own social situation and into the social situation of the other" (Gillespie & Richardson, 2011, p. 609) doesn't require imagining what another person may be thinking or feeling, but rather remembering:

> Although the perspectives of self and other within any ongoing social act are necessarily divergent, if one takes into account time and a stable social structure, then it is possible that at some previous point in time, the positions of self and other were reversed. Given this, each participant in a social act may, by virtue of previous responses while in the position of the other, already possess the attitude of the other. (Gillespie, 2005, p. 27)

During highly conflictual episodes in the SM workshops, we unsystematically explored this potential by explicitly asking conflicting participants to recall a situation where they have been in a similar position to the one their counterpart was describing. Our preliminary observation is that participants "shifted the blame" away from each other and started to jointly explore actionability in other parts of the system (e.g., the school, the government). This finding is similar to that of Gillespie and Richardson (2011) who found that, in a cooperative problem-solving task, position exchange reduced attribution of blame towards the partner in the task, and rapidly increased attribution of blame to elements of the situation. We also observed a similar development here, with participants shifting their mode of communication from blame to understanding, and started attributing responsibility, or at least attempting to find new solutions beyond their own positions.

Discussion

In this paper, we explored how stakeholders integrate their diverse perspectives in the meaning-making process as they co-construct a causal map during a Participatory SD modelling process. Inspired by earlier work (e.g., Zimmermann, 2017; Zimmermann et al., 2015), we investigated the possibilities that a Meadian (Mead, 1910, 1922, 1934) framework can present for opening up the black box of participation in participatory SD (Rouwette et al., 2002). We further enhanced this scholarship with a Neo-Meadian perspective (Gillespie, 2012; Gillespie & Martin, 2014), which focuses on the role of physical, psychological, social, or symbolic positions occupied by different individuals and which lead to the development of their respective perspectives.

GMB, from an instrumental view, is an object-mediated activity in which participants co-construct a causal map through the integration of respective knowledge and perspectives and represent those in tangible objects (variables, links). During the development of the map, symbols become represented as objects-variables which become "increasingly significant symbolic" (Gillespie & Zittoun, 2010, p. 54) through a process of coordination and integration of stakeholders' perspectives. Hence, GMB can be viewed as a symbolic meaning-making activity that entails perspective-taking between participants in the here-and-now of the social act (systems mapping). Here, we are in agreement with Zimmermann et al. (2015) that causal maps can be explored as *significant symbols*, integrating the perspectives of participants in the social act. However, we emphasise that such significance does not only apply to the systems map in its entirety, but to each individual variable. Specifically, as participants negotiate a symbol brought to the table, they go through a process of enhancing the symbol with perspectives that emanate from their respective social positions. When a symbol evokes dissimilar meanings, there is contestation which provokes clarification and further adjustment of perspectives, allowing for the emergence of significance in the here-and-now. Importantly, as perspectives are orientations to action, significant symbols inherently bear

with them actionability – they are not only integrations of perspectives but, in themselves, stimuli for further action. Actionability thus is not only a process taking place *after* the completion of the systems map but on the very path to its creation. To avoid any misinterpretations, we here, in line with Glăveanu (2021) who view action as it relates to perspectives not as "intentions or goals" but rather as "orientations that channel our thinking and our doing" allowing us to "open up the possibility of acting on the world in a certain manner" (p. 54). In this way, actionability has an impact not only on visible solutions, but also on what is further represented on the map: as participants explore possible actions, they share their perspectives and add further symbols or increase the significance of existing ones.

We then delved deeper into conflictual episodes to understand how participants adjust and coordinate their perspectives. We found that conflicts tend to occur when the interlocuters are in incommensurable positions (stable and especially transient) and fail to engage in position exchange. While such incommensurability, in addition to complementarity, of positions is fertile ground for position exchange (Gillespie, 2005), participants may also become "trapped" in transient positions and not find ways to take the perspective of the other toward the self. This may lead to blame attribution and impede the creation of conscious shared meaning. Herein lies the implication for GMB practice in facilitating coordination of perspectives. In instances where we observe participants, in either end of the position dyad, failing to realise that they implicitly carry with them the perspective of the other and share some of the same meanings, the facilitator should make it explicit. In doing so, they could be decentring (transient) positions that could be in play and, as a result, create a common ground in which both participants could begin taking the perspective of the other toward themselves. PET provides an understanding that participants are dialogical beings who have 'layered up' "psychological perspectives and discourses" (Gillespie & Martin, 2014, p. 74) from occupying different positions in the world. Which of those positions (and associated perspectives) become centred during the GMB process is part of the participants' mutual adjustments and of facilitation practice. Assisting participants to see the common positions they occupy can help them develop empathy and better coordinate perspectives and action (Glăveanu, 2021).

Limitations and Further Research

The study is limited by the fact that participants were role-playing allocated personas, an aspect that may have either hindered them in their capacity to "own" the perspectives associated with these particular positions or made them more rigid in their interpretation of that position/perspective. Despite this limitation, our preliminary understanding is that the "surplus of meaning and understanding" (Glăveanu, 2019, p. 453) we observed may relate to the multitude of positions that participants occupy simultaneously in social interaction (not only of self/other positions but also the many positions evoked *within* the self). We see further opportunities from the application of Position Exchange Theory (Gillespie, 2012; Gillespie & Martin, 2014) both in terms of an analysis mapping all the positions from which participants speak from, as well as the systematic induction of position exchange in times of conflict.

Furthermore, we could only provide, at this time, a rather superficial analysis of conflicts that emerged during the GMB process and especially their productive potential. While the Meadian framework emphasises that conflicts are the basis of analytical

thought (see Biesta, 1998), it can prove challenging to separate what it means to 'take the perspective of the other' and what it means to 'be in agreement with the other', the one not presupposing the other. Intersubjectivity, as a mechanism of bridging between "own subjective and isolated meaningful worlds by imagining what the world of the other person is like" (Sammut et al., 2013, p. 3) is not the sharing of one single meaning but that of a "divergence of   perspective" (Gillespie, 2005, p. 25). In this way, intersubjectivity cannot be conflated with agreement (Marková, 2003; Matusov, 1996), and we find ourselves identifying with proposals that a dialogic perspective can enhance the pragmatist tradition and alleviate some of its limitations regarding a subtle focus on consensus (Glăveanu, 2018, 2019). Further analyses should attempt to better incorporate this dialogical aspect in examining the process of GMB (e.g. Bakhtin, 1981, 1984).

    While a preliminary observation, objects in GMB practice may play a role in allowing for decentring from one position and recentring to another one. As positions are significant in relation to the potential for perspective-taking, further investigations can benefit from a socio-cultural perspective of object mediation (Vygotsky, 1981; Wertsch, 1997, 1998). Such a perspective can further extend current work on the role of objects in the meaning-making process during GMB (Black, 2013; Black & Andersen, 2012), particularly combined with an analysis of the positions from which participants speak.

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