



# Applying an Organizational Psychology Model for Developing Shared Goals in Interdisciplinary Research Teams

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Developing solutions to contemporary sustainability challenges requires new integrative forms of knowledge production, such as those embodied by interdisciplinary research approaches. The growing interest and investment toward building successful interdisciplinary collaborations has led to an emergent body of literature focused on understanding how to optimize interdisciplinary research processes. One of the recurrent themes throughout this literature has been the importance of establishing shared goals at the onset of research efforts, which can increase the efficiency and efficacy of both knowledge production processes, and efforts to link that knowledge to decision-making processes. To date, however, there remains little guidance for the most effective methods for establishing shared goals within interdisciplinary research environments. To help address this gap, in this paper and via a case study, we explore the utility of an organizational psychology model, the ASPIRe model, for developing shared goals within sustainability-focused interdisciplinary research teams.

## Introduction

It is widely accepted that identifying solutions to contemporary sustainability challenges for societal well-being requires new integrative forms of knowledge production.<sup>1,2</sup> While integration can take many forms, the prevailing discourse is largely centered on the notion of interdisciplinary research, the situation whereby scholars from different disciplines collaborate to develop and integrate terminology, research approaches, methodologies and/or theories across multiple disciplines in a meaningful way to meet shared research goals (adapted from Roy et al.<sup>3</sup>). When done effectively, it is argued that interdisciplinary research can identify and develop solutions to increasingly complex and intractable sustainability problems in ways that are ecologically, economically, and socially desirable, thus increasing the likelihood of success in applied interventions.<sup>4,5</sup>

Given the touted benefits, interdisciplinary research has now become mainstream practice for sustainability researchers and funders, reflected by the ever-increasing number of interdisciplinary research projects globally.<sup>6</sup> However, despite this investment and effort, interdisciplinary research within the sustainability sciences has yet to reach its full potential whereby the terminology, research approaches, methods, and theories of different disciplines are truly integrated to understand and develop solutions to complex social-ecological challenges.<sup>7</sup> Rather, numerous studies have documented the inherent difficulties for individuals and their organizations in developing, managing, and facilitating meaningful interdisciplinary research processes.<sup>8,9</sup> As a result, there has been an increase in academic attention recently toward improving the practice of interdisciplinary research. For example, studies have sought to

identify new strategies and approaches for optimizing collaboration within interdisciplinary team environments,<sup>10,11</sup> while others have sought to improve training for future generations of interdisciplinary researchers.<sup>12,13</sup>

Despite recent progress in our understanding of how to improve collaborative interdisciplinary research practices, there remains no guidance on the best strategies for establishing meaningful research goals at the outset of an interdisciplinary research program that reflect the various perspectives of all team members. Identifying such strategies, however, is critical based on recent evidence suggesting that the presence of shared goals among team members not only underpins the successful production of interdisciplinary knowledge (A.V. Norström, C.C., et al., unpublished data) but also the effectiveness of efforts to link new and emergent knowledge to decision-making processes.<sup>14,15</sup> Indeed, these findings are consistent with those from other fields and sectors, including human resources,<sup>16</sup> project management,<sup>17</sup> clinical medicine,<sup>18</sup> and business management.<sup>19</sup> Within these fields and sectors, evidence shows that shared goals are important for establishing a shared vision among research participants, which in turn enhances efficiency within the team, increases team commitment toward achieving the collective vision, and promotes open communication and cohesion among team members.<sup>18</sup> Thus, in combination, the establishment of shared, clear, and measurable goals can improve the efficacy of interdisciplinary research processes.

Despite the widespread recognition of the value of shared goals for effective interdisciplinary teams, there is a distinct lack of research investigating the effectiveness of different goal-setting strategies across different contexts. Egghs



et al.,<sup>20</sup> however, outline a typology of commonly used approaches. These include techniques and methods that engage all team members within the decision-making process (e.g., [1] brainstorming, whereby team members share and discuss ideas in an open forum irrespective of their quality or [2] Delphi Groups, where team members make private judgements on solicited goals, which are then pooled and anonymized and shared among the group for discussion to obtain a collective opinion) through to approaches where a select group of individuals (normally associated with organizational hierarchy and power) make decisions on the broader group's behalf (e.g. leadership committees). In terms of specific practices, Bennett et al.<sup>21</sup> offer a process for establishing shared goals in the interdisciplinary medical setting, proposing that a team leader presents a vision for discussion by team members in order to bring all team members to that shared vision. This discussion-based approach is also reflected by Monteiro and Keating,<sup>22</sup> who promote the value of repeated meetings in order to establish and confirm shared goals via the exploration of misunderstandings. These approaches highlight the importance of within-team interactions for establishing shared goals but not the process or strategy for designing the interactions to be most productive.<sup>23</sup> It is our view, however, based on existing published examples of goal setting, that goal setting processes are typically taken to be self-evident, with good practice adopting the more participatory approaches outlined by Eggins et al.<sup>20</sup>

While approaches such as those outlined above may be effective for identifying the ways in which different groups should approach a specific task, they have not offered insight on the basis by which different groups are formed, and the ways in which the full complement of perspectives that exist among members of the group can be integrated into collective goals. Indeed, as highlighted by a growing body of evidence from social and organizational psychology, developing approaches to goal setting that account for the different ways in which groups are formed, and for divergent perspectives among group members, will increase the likelihood that the group is successful in achieving their stated goals.<sup>24,25</sup>

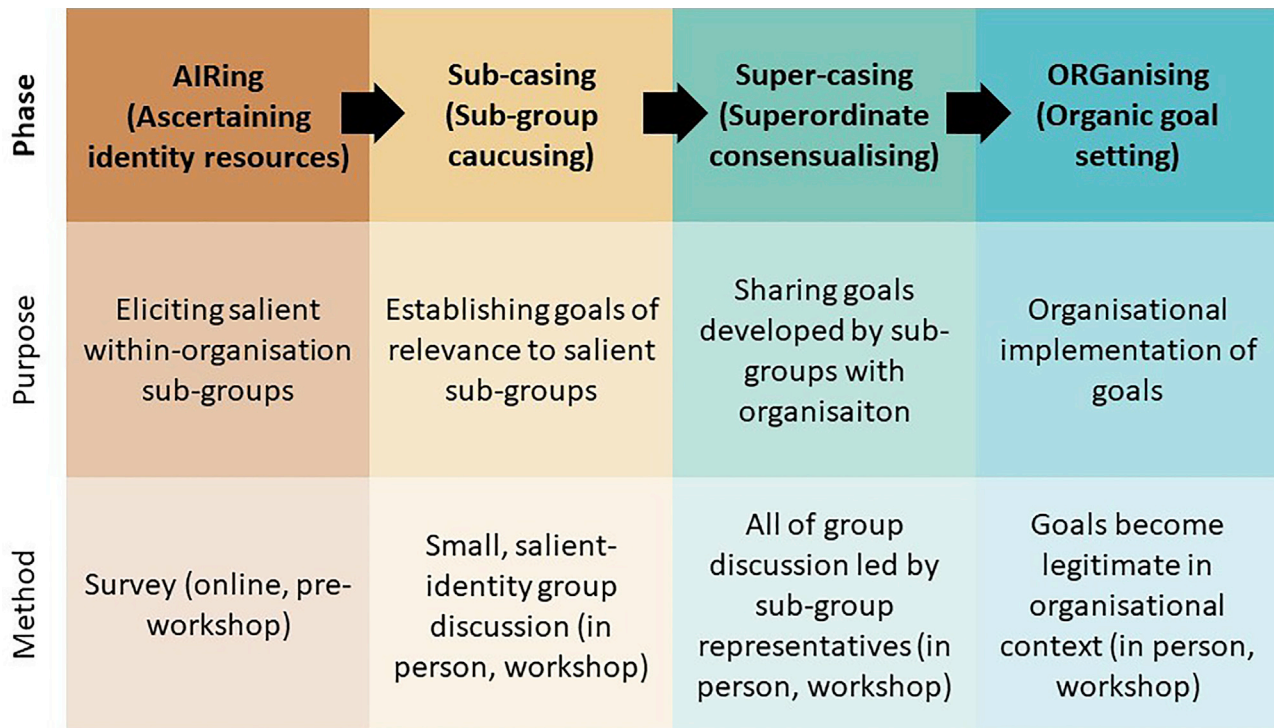
In a first step toward filling this knowledge gap, in this paper, we begin to explore the utility of an organizational psychology model—the ASPIRe model (Actualising Social and Personal Identity Resources)—as a means of developing shared goals among interdisciplinary research teams.<sup>24</sup> This model recognizes that people enter teams and other groups not only with attributes, characteristics, values, and skills that make them unique individuals but also with a host of attributes, characteristics, values, and skills that they share with others. In its most basic form, the ASPIRe model, therefore, recognizes that people enter teams with identities both as unique individuals—referred to in the model as their personal identities—and as members of a variety of social groups—referred to as their social identities. Of course, people have a vast array of social identities, including (but not limited to) ethnic and national identities, gender identities, and perhaps most importantly for our analysis of interdisciplinary teams, research discipline identities. Moreover, just as people have idiosyncratic values and norms associated with their personal identities, they also have values and norms that they share with others based upon their social identities. In the context of interdisciplinary teams, this is a recognition that peo-

ple in the teams are not simply individuals but in many respects representatives of their respective disciplines.

It is worth pausing at this point to recognize other interpersonal and intergroup dynamics that often structure small-group decision making. What the ASPIRe model seeks to do is work to develop a shared psychological sense of “us,” a shared social identity. But we know that people's behaviors are multiply determined and guided by multiple individual and group processes. Individual differences in personality, as well as more social processes such as material interdependence, status, and power differences all come into play.<sup>26,27</sup> Of course, entire conceptual and empirical analyses can, and have, focused on these processes in small-group dynamics,<sup>28–30</sup> and it is beyond the scope of the current paper to review all of these. The key point currently, however, is that the ASPIRe model recognizes that none of these factors are set in stone: like most psychological processes, they are dynamic and context dependent. One of the purposes of the ASPIRe model is to foster, develop, and enable that team-based identity. That means that behaviors at all states of ASPIRe must include respect for others, fairness in interactions, trust in others (and the demonstration of that trust), and, of course, equal opportunities for voice—a primary focus of ASPIRe.<sup>24</sup>

The ASPIRe model thus starts with the fundamental recognition of the diversity of identities that exist within a team in any given context. It then outlines a series of interventions that aim to develop a strong, cohesive, and meaningful “superordinate” identity (e.g., an overarching, shared identity as members of the interdisciplinary team) while recognizing the value to both individuals and the superordinate group of the other social and personal identities that team members bring to the new setting. Thus, it is through working with both personal and social identities as a reality of how people see themselves in the world and engage with others that the ASPIRe model fosters meaningful identification with the superordinate, team identity. In this way, the ASPIRe model is posited to enable the successful collaboration and performance of interdisciplinary teams. Indeed, by respecting, harnessing, and fostering the variety of personal and social identities that team members bring to the situation, a new shared social identity can be developed in which all members can work proactively in pursuit of their collective vision. Further, the ASPIRe model allows for meaningful goals to be articulated that are acceptable to all individuals and subgroups (e.g., different disciplines) within a new team environment. Indeed, evidence in support of the ASPIRe model has already been garnered from a range of quantitative and qualitative studies across a range of organizational contexts.<sup>31</sup> These include those relating to hospitals,<sup>32</sup> military medics,<sup>33</sup> education,<sup>34</sup> and international climate change negotiations.<sup>35</sup>

To begin an exploration into the utility of the ASPIRe model within an interdisciplinary research setting, the remainder of this manuscript is divided into three main sections. First, in the next section, we review the available literature on ASPIRe, outlining key features and potential benefits for interdisciplinary research practices. We then reflect on our recent experiences applying the ASPIRe model to develop shared goals within an interdisciplinary research environment and share the lessons we learnt. Finally, we identify the major research gaps that limit



**Figure 1. The ASPIRe Model for Actualizing Social and Personal Identity Resources in Organizational Settings**  
 Modified from Haslam et al.<sup>24</sup>

our understanding about the utility of the ASPIRe model and articulate the work that we feel is needed to better understand and realize its value to interdisciplinary research teams.

**The ASPIRe Model**

Emerging out of the social and organization psychology literature, the ASPIRe model is founded upon principles in social identity and self-categorization theories.<sup>36,37</sup> As outlined above, it recognizes that people have both personal and social identities. Critically, no single personal or social identity is assumed to be more true or valid than another within any given individual. Social identities (e.g., who we are as environmental scientists) are just as psychologically valid and meaningful to people as their personal identities (e.g., those attributes that make us unique and different from all others). Moreover, in any given situation, people’s personal identities or one of their many social identities, will become “cognitively salient.” In this respect, cognitively salient describes the subjective manner by which people understand and define themselves in any given situation. In the context of interdisciplinary research teams, a social identity likely to become salient is that of team members’ disciplines. Critically, once a (personal or social) identity is cognitively salient, people are assumed to act in accord with the norms and values of that identity. This means that, in the context of interdisciplinary team, for example, team members from different disciplines (i.e., acting as a function of different disciplinary social identities) may act in accord with the different norms (e.g., that guide research methods) and values (e.g., that may place priority on basic or applied research) of their respective disciplines. The obvious problem, then, is that the members may act less like

members of a cohesive team as they pursue (and potentially bicker over) their different norms and values. Indeed, the salience of these different social identities may inhibit cohesion and cooperation between team members, communication and knowledge exchange among team members, trust, and a willingness by all team members to enact collective goals.<sup>38–40</sup>

Building on the principles articulated through the social identity literature, the ASPIRe model as developed by Haslam et al.<sup>24</sup> seeks to translate social (e.g., interpersonal, intragroup, and intergroup) and psychological (e.g., motivational and information processing) insights into a model to enable improved organizational practice. The model is structured into four discrete phases as outlined in Figure 1.

The first of these is referred to as AIRing (or ascertaining identity resources), which seeks to reveal the existing valued subgroup (e.g., the different disciplinary) social identities to recognize, respect, and utilize the norms, values, and skills associated with identities to inform subsequent work.<sup>20,41</sup> This can be achieved simply via the implementation of a survey in advance of the workshop, asking team members to nominate the group of colleagues with whom they feel the greatest affinity and those with whom they collaborate most closely. A key component of the AIRing process is that the groups identified do not need to be formally recognized within the organization’s/team’s structure but rather reflect shared characteristics that individual team members perceive to be important for their work-related activities.<sup>24</sup> In doing so, this phase of the ASPIRe model facilitates the construction of an identity map that serves to illustrate the contours of significant and meaningful subgroup identities that exist within the organization.<sup>33</sup> This phase is crucial in

identifying, recognizing, and valuing identities that individual team members bring to the team situation. It provides individual respect through voice,<sup>42</sup> thereby enhancing commitment to the broader ASPIRe process.<sup>39</sup>

In the second phase of the ASPIRe model—known as Sub-casing (or subgroup caucusing)—each of the subgroups identified through the AIRing process are brought together to engage in internal discussion and debate on two key topics. First, it should allow subgroup members to identify and collectively work to agree upon shared goals. Second, it should identify any potential barriers (e.g., organizational, individual, financial) that obstruct the achievement of those goals. An important outcome of this discussion is the further development of a shared identity among subgroup members, increasing their commitment to the remainder of the ASPIRe process and its eventual outcomes.<sup>43</sup> This phase is crucial in identifying, recognizing, and valuing shared social identities that team members from various subgroups bring to the team situation. Like phase 1, it provides respect through voice, but this time respect is based upon valued social identities.

The third phase of the ASPIRe model—known as Super-casing (or superordinate consensualizing)—intends to bring the goals of each subgroup into alignment through the specification of higher-order organizational goals.<sup>33,44</sup> By doing so, the main aim of this phase is to move toward the situation in which team members define themselves as members of the overall team (e.g., the interdisciplinary team) while simultaneously retaining their identification with their valued subgroup (e.g., discipline) memberships.<sup>24</sup> In this phase, the subgroup members (preferably, but if unavailable, representatives of each subgroup) come together to present and discuss the outcomes of the previous phase (i.e., the agreed goals and barriers to achieving those goals). Thus, in effect, Super-casing replicates the specific tasks of the Sub-casing phase, but this time with a view of bringing to bear the subgroup goals at the organizational, team level.<sup>45</sup> This phase is crucial in increasing trust between members of different subgroups, enhancing successful communication between groups, and facilitating creativity and greater enthusiasm toward attaining collective, team-based goals.<sup>46</sup>

Finally, in the fourth phase of the ASPIRe model—ORGANIZING (or organic goal setting)—the goals that emerged and were discussed in the previous steps are formalized into a strategic plan that forms the basis for future team-based activities. This is achieved by evaluating the appropriateness of all emergent goals in accordance with a broader organizational mission (i.e., the overarching purpose for the team/group's existence and their actions for meeting that purpose) and vision (i.e., what the team/group wants to become in the longer term).<sup>47</sup> In this respect, the role of organizational leadership becomes critical to the process, as key decision makers (e.g., research leaders) must play a key role in the process. However, while this phase of the ASPIRe model may require greater input from leaders within the organization, it should be done in a manner that continues to actively engage team members in the process (e.g., via facilitated discussions) to ensure that all organizational members feel empowered by the outcomes.<sup>48</sup>

As highlighted throughout the previous paragraphs, there are several benefits associated with the ASPIRe model. Most notably, these relate to increasing the efficiency and efficacy of

teams via the establishment of shared goals that reflect the full diversity of values and groups within the organization, and the consequent development of, among other things, higher levels of trust, cohesion, creativity, and communication. In addition, however, there are other benefits that can arise through the ASPIRe process that further suggest that it may be suitable for use in interdisciplinary research settings. For example, organizational leaders who take part in the process will come to embrace a different and more nuanced understanding of the organization from what they had previously held,<sup>49</sup> which in turn, will allow them to engage more effectively with all members of their organization. In doing so, the ASPIRe process can create an identity-based bond between “leaders” and “followers” (where previously there may have only been social categorical division), which will result in a new identity resource from which the whole organization can prosper.<sup>47</sup>

Although the ASPIRe model has been developed in the organizational psychology literature, its primary objective of developing shared goals that recognize the diversity of all team members highlight its potential value to interdisciplinary team research settings. In such cases, as we have suggested throughout, the “organization” is simply the members of a specific interdisciplinary research team involved in a collaborative project, or an interdisciplinary research group more broadly. In the next section, we discuss the application of the ASPIRe model to the latter of these to explore its utility for establishing shared goals within an interdisciplinary research group and elucidate key lessons to refine its implementation in the future.

### Reflections on Applying the ASPIRe Model

In April and May of 2019, two of the authors (C.C. and R.M.C.) were invited to apply the ASPIRe model to the Centre for Marine Socioecology (CMS) in Tasmania, Australia, to identify and articulate shared goals among their members, and underpin a subsequent impact plan to guide their strategic activities over coming years. This invitation arose given the lead author's affiliation with the CMS, formerly as a post-doctoral researcher and presently as an adjunct fellow. The CMS represents an ideal case study to test the utility of the ASPIRe model given that members of the CMS are drawn from two research institutions (The University of Tasmania and the Commonwealth Scientific and Industrial Research Organisation) and represent disciplinary expertise in physics, law, economics, biology, sociology, and governance. The overarching vision of the CMS is to become “a world-leading centre to support informed and sustainable management of multiple-uses in marine and coastal systems,” the pursuit of which necessitates interdisciplinary research. In this section, we discuss our key reflections from applying the ASPIRe model to the CMS. The process implemented at CMS reflected closely the recommendations of the ASPIRe model, with core elements including an online survey followed by a two-day workshop (detailed in [Note S1](#)). In this perspective, we reflect on the process but not the outcomes of the workshop. Thus, we do not disclose any detail regarding the content of the discussion at the CMS, we only reflect on the process itself and identify lessons for others seeking to implement the ASPIRe model within interdisciplinary research settings.

Our first reflection relates to the ethical considerations associated with using the ASPIRe model. During both the AIRing

phase and subsequent workshop activities, potentially sensitive information is collected about participants, including the extent to which they identify with their workplace, with whom they identify in their workplace, and reflections on formal and informal groups that exist within the workplace (AIRing survey provided in [Note S2](#)). Depending on the nature of the responses volunteered by participants, and the social/organizational culture and context, this information may be sensitive for a range of reasons. For example, if a workplace had elements of a toxic culture, the risk of eliciting sensitive information would be further heightened beyond baseline levels of risk. Thus, ethics is critically important—both in terms of formal human ethics processes (e.g., attaining ethics approval for any activities that would result in sharing of collected data) and non-formalized ethics of professional conduct and practice.<sup>50–52</sup> Particularly important ethical dimensions include confidentiality, protection of privacy, and anonymity of any shared findings.

Further, from our experience with implementing the ASPIRe model in the CMS, we found that the most critically valuable insight offered by the model, which differs from a perhaps more intuitive or traditional workshop facilitation process, was the AIRing process. Through AIRing, we were able to establish meaningful and relevant groups for the first in-person workshop activity, Sub-casing. Anecdotal feedback from workshop participants indicated that this approach was a welcome and productive difference from expectations and workshop norms. Through the AIRing process, we were able to draw from participants' indications of their own lived social reality within their workplace. However, the findings of the AIRing process were supplemented substantially by the first author's experiential knowledge of the CMS social environment. This filled a knowledge gap in the AIRing process created by (1) workshop participants who had not completed the pre-workshop survey and (2) findings in the survey that could be interpreted equally in multiple ways (i.e., multiple group arrangements that could follow the same results).

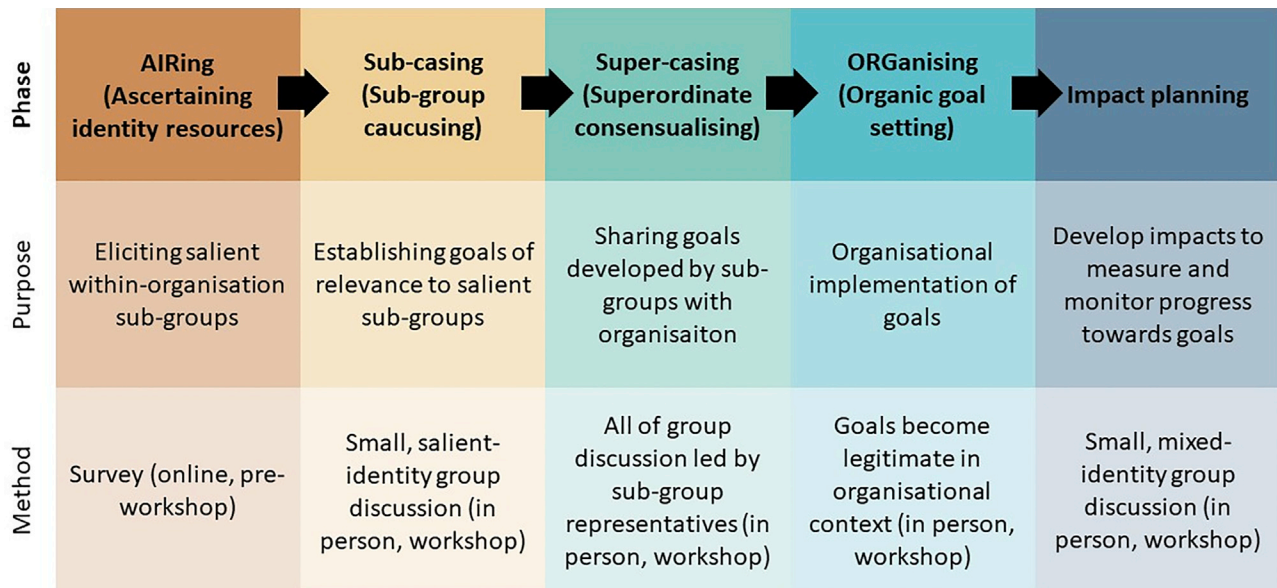
The value, here, of experiential knowledge, however, is in tension with our observation of the importance of ethics and confidentiality. Should an "insider" facilitate the AIRing process, as was the case in our experience, it is of critical importance that the "insider" not only manages confidentiality of responses to the AIRing process (and any other sensitive information) but also manages ethically any future interactions that may be unintentionally shaped by the access to the knowledge gained from the process. Our experience benefitted from the balance provided by C.C.'s insider knowledge of the CMS social environment, and his professional distance through primary affiliation at a different institution. We recognize that this situation may not be the case for others who wish to trial the ASPIRe model and so caution that ethical considerations ought to take precedence over access to information. As a consequence, the best case scenario for the AIRing process in some cases may be for an external facilitator to do their best without experiential knowledge in order to uphold standards of ethical practice. Despite this dependence on experiential knowledge, in our experience, we feel the AIRing process underpins the ASPIRe process and is a highly valuable innovation for use in the interdisciplinary research setting. However, as discussed in the next section of the manuscript, we note that additional research is needed to

identify options to enhance the AIRing process in situations whereby suitable experiential knowledge may not be available (e.g., when using a third-party facilitator).

Further to this, we note the importance of workshop rules, such as creating a welcoming and open yet critical and reflexive space. A third-party facilitator could offer value in this regard, especially in cases where those responsible for the ASPIRe process lack facilitation skills and experience. Whether to prioritize external, third-party facilitation or internal, experiential knowledge for facilitation will be a question for those administering the process and should be considered on a case by case basis. We do note there could be benefit in a partnered approach, where a trusted and ethical person internal to the research setting works with an external facilitator to benefit from both independence of facilitation and contextualized knowledge.

The ASPIRe model centers on developing organizational goals. We found this objective to be quite broad, perhaps intentionally to allow for the ASPIRe model to be applied across settings. Thus, we included a fifth phase to the ASPIRe model, to adapt the goals into something more targeted to the organizational context both with regard to content and structure ([Figure 2](#)). This fifth phase was specifically focused on impact planning, whereby workshop participants identified a series of impacts that allowed CMS members to develop more specificity about what they and their groups wanted to achieve, and the desired order in which they should be achieved (following the impact-planning framework outlined by Reed<sup>27</sup>). Further, the tangibility of the impact-planning framework provided a mechanism for monitoring progress of the outcomes of the ASPIRe model (following Haslam et al.<sup>24</sup>) as we developed it in a sequential way. We would encourage broad consideration of this approach for those looking to apply the ASPIRe model in other interdisciplinary research settings, because it aligns closely with overarching trends in research, such as the growing requirement for planning for and reporting on impact.<sup>27</sup> In terms of structure for both the ORGAnizing and impact-planning phases, we adopted the SMART goals (specific, measurable, achievable, realistic, and time-bound) approach.<sup>53</sup> This allowed for a directed and clear framework within which the groups could develop goals that were consistent in form between groups and designed to be of relevance for application in the organizational setting.

Finally, we note that workshops can be intense and mentally/physically draining on participants and conveners. We found this to be true from our experiences applying the ASPIRe model, and thus as with all workshops, we note the need to build in time for breaks and balance the cognitive workload across time to avoid fatigue, frustration, and burnout. The modular structure of the ASPIRe model aligns well with a structured workshop, and the sequencing and timing of activities we adopted worked generally well. We also note that in settings where social cohesion and shared identification are priorities, attentiveness to more practical matters, such as the arrangement of workshop furniture, can be of value. Creating a physical space where all participants are *a priori* positioned equally, and that allows for break out groups to discuss in comfort and relative privacy, will be important to the successful implementation of the ASPIRe model, among other interactive and collaborative processes.



**Figure 2. An Extension of the ASPIRe Model for Actualizing Social and Personality Identity Resources in Organizational Settings, Including Impact Planning as Implemented by the Authors**

### Future Directions for Operationalizing the ASPIRe Model

To this point, we have presented the case that the ASPIRe model may represent one approach to developing meaningful and shared goals within interdisciplinary research teams. Indeed, from our experiences applying it to the CMS in Australia, we believe it has significant potential value and warrants further testing and refinement, especially by hybrid practitioner-researchers who can simultaneously implement and evaluate the model. Further, and noting that established methods for evaluating ASPIRe are largely missing (as detailed later in this section), a short quantitative survey that we administered to workshop participants following the process (which was completed by 67% of workshop participants) also suggests that the ASPIRe process may be well suited to setting goals in interdisciplinary research teams (for the survey and results, please refer to [Note S3](#)). To briefly summarize the post-workshop quantitative evaluation, 83% of those participants who completed the survey considered the ASPIRe process to be “effective” or “very effective” for setting goals and identifying impacts within an interdisciplinary research environment. No participants considered the process to be “ineffective” or “very ineffective.” Thus, in this section, we outline some of the critical research needs that, based on our experience applying the ASPIRe model, should be addressed to more comprehensively understand and realize its value within interdisciplinary research settings.

First, work is needed to determine the most suitable approach for undertaking the AIRing phase of the process. As stated in the previous section, the success with which the AIRing process establishes meaningful subgroups largely underpins the entire ASPIRe process; however, to date little guidance exists on the best way to undertake the AIRing process (see also Reynolds et al.<sup>41</sup>). In existing applications of the ASPIRe model, quantitative surveys have been used. However, as these were undertaken in different sectors, their applicability to interdisciplinary

sustainability research was limited. Thus, future research should focus on developing best approaches for a baseline survey for use in the AIRing phase. Further, consideration should be given to alternative research methods that could either complement, or replace, quantitative surveys to more comprehensively and accurately identify the most salient subgroups within the organization and reduce the reliance on the experiential knowledge of the facilitator. In particular, the incorporation of social network analysis (SNA) might be useful, given its ability to uncover social relationships and patterns of knowledge sharing among actors.<sup>54</sup> However, the additional time and resources (e.g., cost) that would be required by SNA must be considered in the context of applicability of the model in interdisciplinary research settings.<sup>55</sup> Finally, additional research is also needed to develop strategies to identify meaningful subgroups among team members in the absence of sufficient AIRing data. While in the present study we were able to draw on the experiential knowledge of the author group, this may not always be possible, for example, when using a third-party facilitator or applying the model to a consortium comprised of numerous partner organizations.

Next, there is a need to formally evaluate the effectiveness of the ASPIRe model when it is applied in interdisciplinary research settings. The evaluations could take many forms, with the simplest simply being a survey of participants at the completion of the process to understand their levels of satisfaction. This aligns with the recommendations of Haslam et al.<sup>24</sup> to incorporate ongoing monitoring and evaluation of the outcome of the ASPIRe model in organizations. However, given the limitations of structured quantitative research approaches that do not allow for the in-depth exploration of key barriers, challenges, and successes,<sup>56</sup> we suggest that the potential of qualitative methods is worth further examination. For example, qualitative interviews have previously been applied to evaluate the effectiveness of interdisciplinary research projects<sup>57</sup> and provide a much

deeper understanding of the effectiveness of a process, as well as options for improving it into the future.

Third, for the ASPIRe model to be successful, it is critical that the goals developed are acted upon. As highlighted through the basic principles of goal-setting theory,<sup>58</sup> goals are most likely acted upon when they are both specific and achievable. As we noted above, in our application of the ASPIRe model, we adopted the SMART approach.<sup>53</sup> However, the inclusion of this step was *ad hoc* and made *in situ* (1) based on our observation of how the various groups were developing their goals, and (2) because of its familiarity to the authors. Thus, future research is also needed to understand the characteristics of interdisciplinary research goals that underpin the extent to which they are acted upon, i.e., how to best structure goal development processes to reach useful and relevant goals. In addition, we encourage research on how such goals can be most effectively integrated into the ASPIRe model to increase the utility of the goals identified (e.g., at which stage of the process goals should be introduced, and whether any goal-specific modifications are required to the core ASPIRe model).

Additional consideration and research is also needed toward identifying suitable mechanisms for measuring and monitoring progress toward achieving the full suite of goals identified via the ASPIRe process. Indeed, monitoring is considered to be a critical component of goal attainment because it underpins real-time learning, reflexivity, and adaptability, which all contribute toward the efficiency and efficacy of processes involving diverse team members.<sup>59,60</sup> To fulfill this objective, we included a fifth phase to the ASPIRe process, focused on identifying a series of tangible and hierarchical impacts that should be obtained on the pathway toward achieving the broader goals.<sup>27</sup> However, future research is required to understand the best approach for developing and incorporating a monitoring program into the ASPIRe model and to support effective interdisciplinary research more broadly.

Finally, future research should seek to understand the suitability of the ASPIRe model for setting goals across a diversity of interdisciplinary team environments. That is, while the CMS represented a suitable case study to test the ASPIRe model, and our preliminary evaluation suggests that participants found the process useful, we also recognize that the CMS is a relatively specific and narrow case study (e.g., most participants are co-located, all work on marine-related issues, all individuals are academic/scientific actors). Thus, future research should apply the ASPIRe model across different settings (e.g., to larger teams, geographically dispersed teams, teams working on different ecosystems, teams involving academic and non-academic actors, etc.) to understand its utility more broadly.

### Conclusions

In this perspective paper, we have begun to explore the potential utility of an organizational psychology model, the ASPIRe model, as a means of developing shared goals among interdisciplinary research teams and organizations. Based on previous applications in other sectors, the model was chosen for exploration given the known benefits associated with enabling better interpersonal and group-based processes. These include, for example, improved cooperation, communication, and trust among all members of diverse teams, which in turn, increase

the extent to which team members collectively work toward achieving their desired goals.

Through our application of the ASPIRe model in a sustainability-focused interdisciplinary research setting (i.e., the CMS in Tasmania, Australia), we believe that the ASPIRe model could indeed represent a promising approach to developing shared goals within interdisciplinary research settings. However, we note there would be value from undertaking further work to tailor and optimize the implementation of the model for this purpose. In particular, as highlighted in the previous section, we note a priority area is further research to identify the methods and approaches (or combination of methods and approaches) to improve the accuracy and utility of the AIRing process, given the importance of this process for underpinning the overall success of the ASPIRe model.

Further, and as highlighted in our reflections, future applications of the ASPIRe model in interdisciplinary research settings should also seek to integrate a fifth phase focused on developing meaningful and tangible impacts associated with each goal to facilitate monitoring, real-time learning, and reflexivity. We encourage others to explore the ASPIRe model in their interdisciplinary teams and to reflect on and share their experiences. While additional work is needed to optimize the ASPIRe model through future research, we posit that in doing so, it will become an effective tool to aid in the establishment of shared goals within interdisciplinary research teams and organizations. In turn, this will help facilitate the production of the knowledge needed to inform the development of sustainability solutions and improve the uptake of that new knowledge among decision makers for ongoing societal well-being and prosperity.

### SUPPLEMENTAL INFORMATION

Supplemental Information can be found online at <https://doi.org/10.1016/j.oneear.2019.12.010>.

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**One Earth, Volume 2**

**Supplemental Information**

**Applying an Organizational Psychology Model  
for Developing Shared Goals  
in Interdisciplinary Research Teams**

**Christopher Cvitanovic, R.M. Colvin, Katherine J. Reynolds, and Michael J. Platow**

## Supplemental Information

### Applying an organisational psychology model for developing shared goals in interdisciplinary research teams

*Note S1: Description of the ASPIRe model as implemented by the authors*

The process implemented at CMS reflected closely the recommendations of the ASPIRe model as described by Haslam et al (2003), with core elements including a pre-workshop online survey followed by a two-day in person workshop. In this perspective, we reflect on the process but not the outcomes of the workshop. As such, we do not disclose any detail regarding the content of the discussion at the CMS, we only reflect on the process itself.

The online survey was administered to all CMS members to elicit the relevant sub-groups that are salient in the work setting (AIRing), as well as explore some additional questions that were relevant to the broader organisational context. See Note S2, below, for the survey as administered by in the CMS. The authors summarised the survey responses, and from this designed groupings that were used in a subsequent two-day workshop, held several weeks following the online survey.

For the workshop, the authors developed a flexible plan based around the core ASPIRe stages.

Day 1 of the workshop opened with introductions and a workshop overview, a report on the pre-workshop survey findings, and an open discussion with all participants about the approach adopted for the workshop and intended outcomes. The afternoon of day 1 involved convening the sub-groups identified in the pre-workshop AIRing process, then Sub-casing to identify all goals relevant within the sub-groups for the CMS. At the end of day 1, each sub-group reported back on the goals discussion, and themes were synthesised in real-time by the authors. This was followed by an open discussion with all participants focusing on the overlaps and similarities among the goals developed by each sub-group. The authors synthesised the core themes after hours for use the following day.

Day 2 opened with a re-cap of day 1 and a summary of the planned day ahead. The authors shared the themes synthesised from day 1 as a lead in to the first activity, Super-casing. Super-casing involved all workshop participants discussing the synthesised themes to identify the core goals for the CMS according to the relevant identity groups. Following this, the authors re-arranged the workshop participants into new groups which contained a mix of the identity groups elicited by AIRing and utilised in the sub-casing process. These groups were used for the ORGanising activity, wherein the goals elicited in sub-casing, synthesised after hours, and discussed in super-casing were re-developed into SMART goals (Specific, Measurable, Achievable, Realistic, and Time-bound), suitable for implementation in the CMS. In the afternoon of day 2, the authors reconvened the workshop participants to discuss the ORGanising experience and share key outcomes. The final activity for the workshop was an extension of the ASPIRe model, aimed to link the model to the CMS institutional requirements and context. As such, the final activity was an impact planning activity, where the same groups from the ORGanising activity built on the SMART goals to add in further detail including: research impacts aligned with each goal; pathways to impact; required or desired resources; and timeframes for achieving the impacts. These discussions were shared by reconvening all participants, and synthesised in real-time by the authors. The close of the

workshop included an open discussion about the process over the two days. All written materials were recorded by the authors for reporting back to the CMS.

*Note S2: AIRing survey developed and implemented by the authors to identify sub-groups.*

The pre-workshop survey that formed the basis of the AIRing phase of the ASPIRe model was developed from existing studies, but tailored towards the unique interdisciplinary research environment of the Centre for Marine Socioecology (CMS). The survey was administered to all CMS members via the online platform SurveyMonkey. It consisted of a combination of Likert-type and open-ended questions. Likert-type questions were scored on a scale of one to ten, whereby a score of one indicated that the respondent strongly disagreed with the statement that they were presented with, and a score of ten indicated that they were in strong agreement with the statement. Using this approach there is no mid-point, meaning that a score of five indicated a slight disagreement with the statement, and a score of six indicated a slight agreement with the statement. Participants were, however, permitted to leave a question blank if they preferred not to answer. For the purpose of this process, a ten-point scale was considered advantageous over smaller scales (i.e. a four point scale which is also commonly used) to allow nuances in the data to emerge. While the Likert-type responses indicated broad trends in the data, open-ended questions allowed the research team to gain deeper insights as to what drove the trends that emerged. We share the survey instrument here not as a demonstration of the optimal AIRing approach, but instead in the interests of transparency and learning. As noted in the main text, we feel the AIRing phase underpins the value of the ASPIRe model broadly, though there is value to be gained through refining the process through which the AIRing phase is undertaken. The survey implemented was as follows:

Page one of survey:

1. Being a member of CMS is important to my sense of self. (Likert-type)
2. Being a member of CMS is an important part of my professional identity. (Likert-type)
3. Being a member of CMS is an important part of my personal identity. (Likert-type)
4. What motivates you to be a member of the CMS? (Open ended)

Page two of survey:

<<CMA vision and mission displayed>>

5. I have confidence that the CMS vision and mission is right for the CMS. (Likert-type)
6. Other CMS personnel have confidence that the CMS vision and mission is right for the CMS. (Likert-type)
7. How CMS operates day-to-day is aligned with the CMS vision and mission. (Likert-type)
8. Long term strategic decisions made within CMS are aligned with the CMS vision and mission. (Likert-type)
9. My professional principles are aligned with the CMS vision and mission. (Likert-type)
10. Please elaborate on how your professional principles align or differ from the CMS vision and mission. (Open ended)
11. My personal principles are aligned with the CMS vision and mission. (Likert-type)

12. Please elaborate on how your personal principles align or differ from the CMS vision and mission. (Open ended)

Page three of survey:

13. In practice, CMS is comprised of a number of smaller formal or informal groups of collaborating personnel. (Likert-type)
14. I see myself first and foremost as a member of formal or informal group within CMS, rather than as a member of CMS broadly. (Likert-type)
15. Being part of a formal or informal group within CMS is important to my professional life. (Likert-type)

Page four of survey:

16. Think about the formal or informal group within CMS most relevant to your professional life. Please list/select the CMS personnel with whom you share this group. Think about: people you trust, people of mutual influence, people you go to when exploring new ideas or projects. (Open ended)
17. Considering yourself with the CMS personnel listed above, how tight or loose is this group within CMS? (I.e., in a tight group it is likely all the names listed/selected would have listed/selected the same personnel, whereas a loose group may see more variation). (Open ended)
18. In 1-2 words, how would you best describe this group within CMS? (Open ended)
19. Please provide your name. (Open ended)
20. Please provide any additional comments you feel are relevant to the topics in the questionnaire. (Open ended)

### *Note S3: Evaluation of the CMS ASPIRe experience*

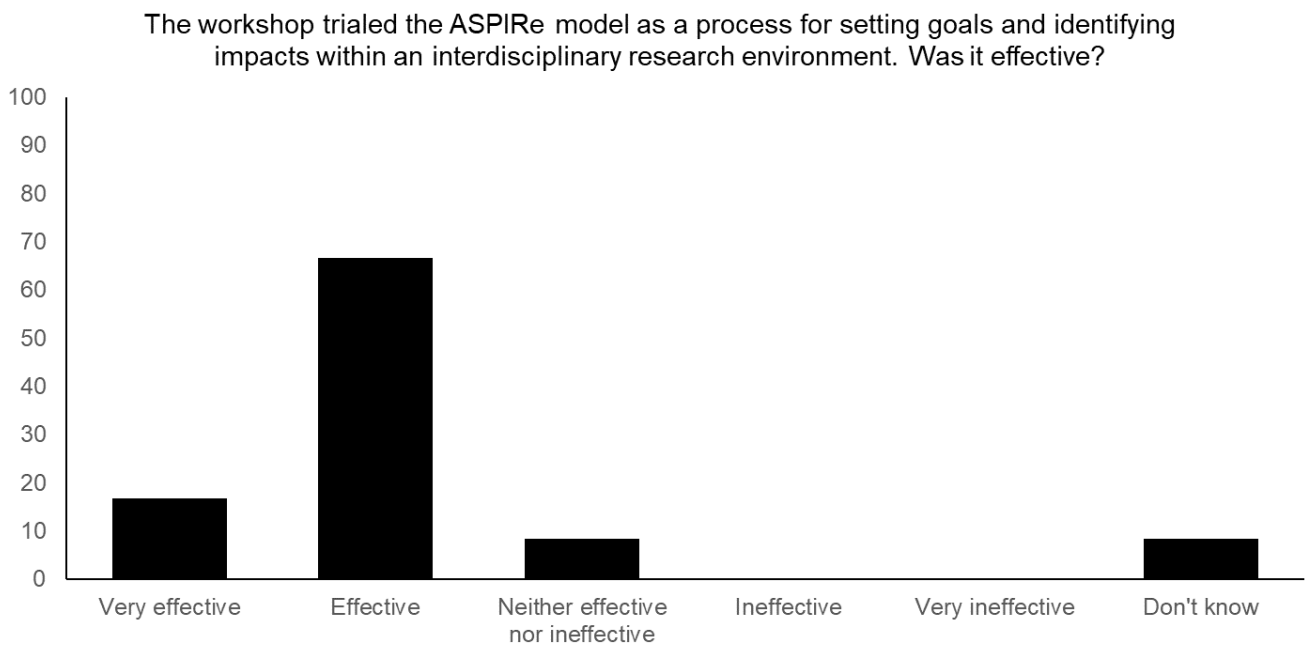
As detailed in the main body of the manuscript (under the heading *Future directions for operationalising the ASPIRe model*), research is needed to understand how best to evaluate the implementation of ASPIRe processes to understand its utility for setting shared goals in an interdisciplinary research environment, and to improve the ways in which it is applied across different settings. Irrespective, to supplement our perspectives about the potential value of ASPIRe based on the CMS case study described in our manuscript, we wanted to elucidate the perspectives of the participants about the process. We did so via a quantitative survey that was administered to all participants via email following the workshop.

The survey was designed to evaluate the perceptions of participants against the key goals of the ASPIRe process, such as the extent to which the process allowed each individual to express their views and the extent to which the use of sub-groups facilitated meaningful discussion. Other components of the survey were designed to understand the general perceptions of participants about the ASPIRe process, including whether or not the process was more effective than other goal setting strategies that they had undertaken previously.

The survey itself was presented as a series of 12 statements, with participants asked to score each statement on a 5-point Likert Scale. To reduce ambiguity and subjectivity of the application of a Likert scale, linguistic qualifiers were attributed to each score (1 = strongly

disagree, 2 = disagree, 3 = neither agree or disagree, 4 = agree, 5 = strongly agree). The framing of statements alternated between positive and negative to try reduce framing bias in the responses. Following the main survey participants were then asked to rank the ASPIRe process overall in terms of its effectiveness on the same 5-Likert scale, with an additional category of “Don’t know”. Finally, the survey concluded with an open-ended question to seek general comments and feedback from the participants on the process.

Twelve of the eighteen workshop participants (i.e. 67%) completed the final quantitative evaluation survey (with 16 invited due to two of the 18 being unavailable due to retirement and maternity leave). Results of the survey show that 83% of responding participants considered the ASPIRe process to be ‘very effective’ (17%; 2 responses) or ‘effective’ (67%; 8 responses). No participants rated the process, overall, negative (i.e. no selection of ‘very ineffective’ or ‘ineffective’), however one participant indicated a neutral position (‘neither effective nor ineffective’; 8%) and one uncertainty (‘don’t know’, 8%). These results are presented in the figure below.



*Figure S1: Participant perceptions regarding the effectiveness of the ASPIRe Model for setting goals in an interdisciplinary research environment.*

Questions relating to specific detail of the process yielded broadly favourable responses to the process. Of note is the high proportion of favourable responses on the positively phrased questions, and lower proportion of favourable responses on the negatively phrased questions examining related aspects of the process. The question that asked participants to compare the ASPIRe process to other workshop processes returned the lowest proportion of favourable responses. In future evaluative efforts, we propose qualitative exploration of participants’ specific recommendations for improvements or comparisons with other successful processes would be of value. The table below summarises the proportion of responses to each question that returned favourable sentiment toward the ASPIRe process (corrected for negatively phrased questions), and subsequent figures for each question present the results visually.

Three responses provided comments about the process in the optional open text field, all were positive:

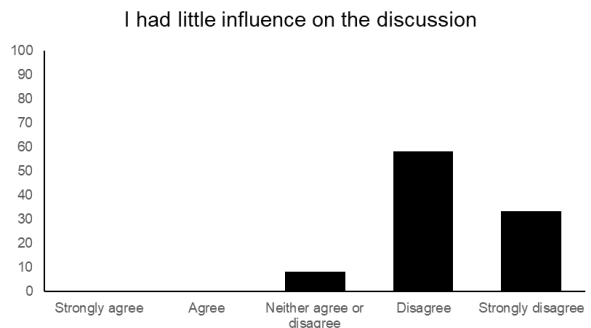
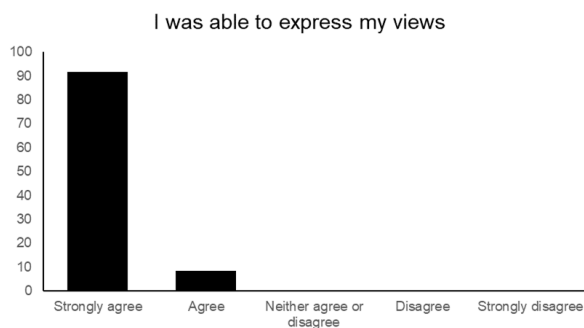
*“I appreciated the discussion in subgroups and the consideration of who was in a group. It provided a safe space to have open discussion and took away an intimidation factor by being with other colleagues at the same professional level.”*

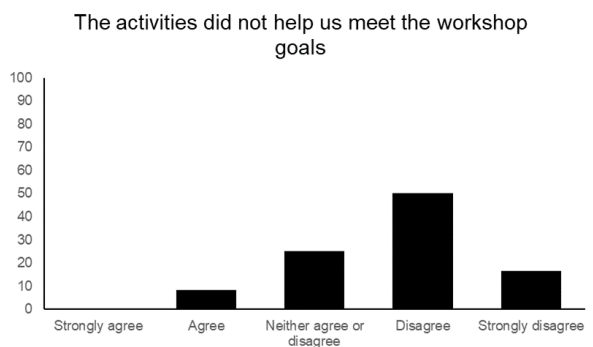
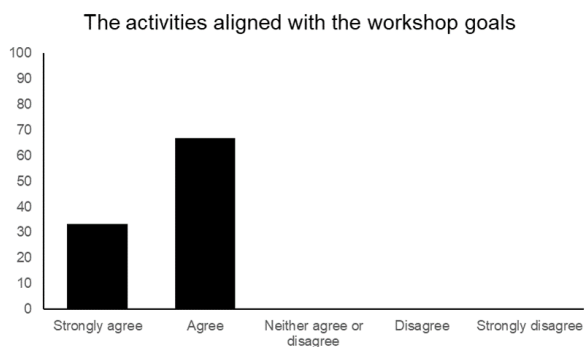
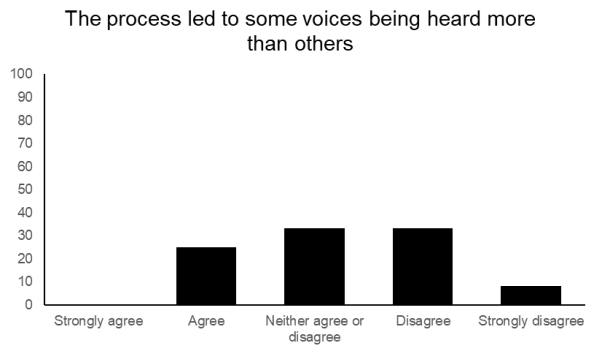
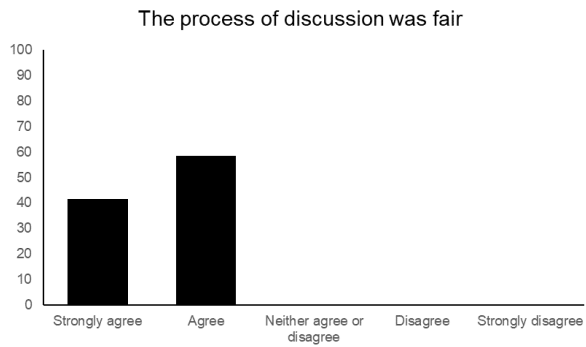
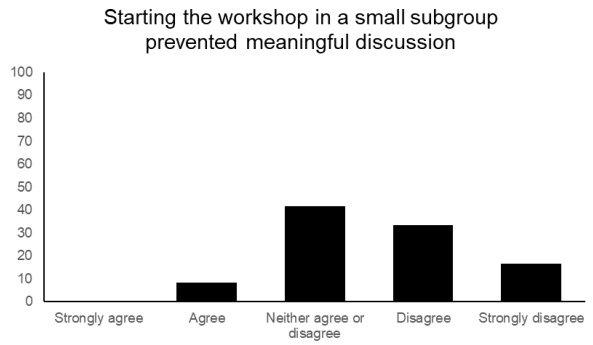
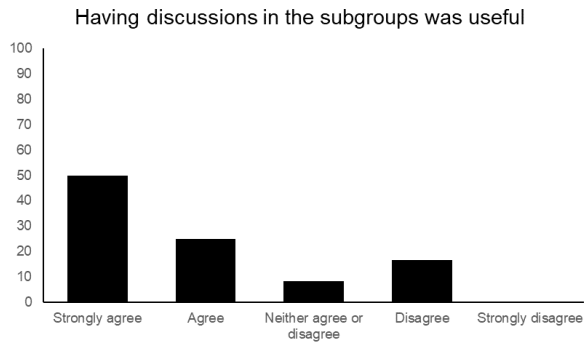
*“It always feel like you need longer :)”*

*“As a naturally shy person, the small group discussions allowed me to feel more comfortable in contributing to discussions, and I felt like I was heard and had some influence over the results.”*

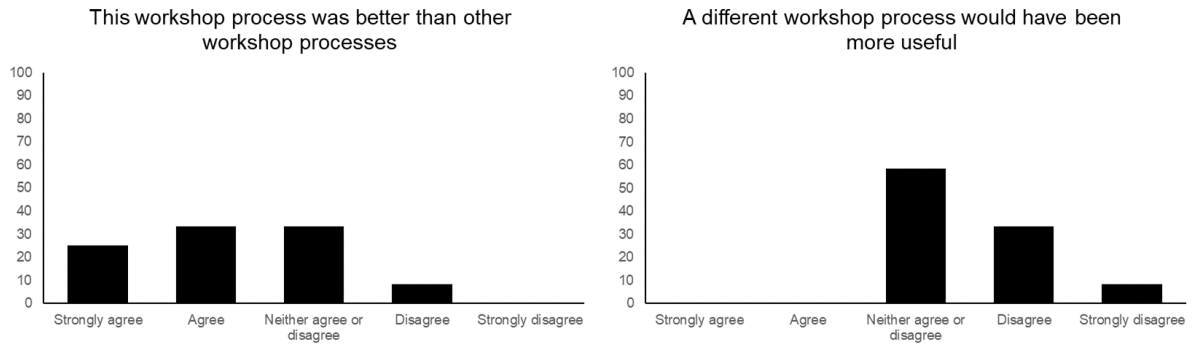
*Table S1: The proportion of responses to each question that returned favourable sentiment toward the ASPIRe process (corrected for negatively phrased questions).*

Statement	% Favourable (neutral)	Statement (reverse coded)	% Favourable; corrected for reverse coding (neutral)
I was able to express my views	100 %	I had little influence on the discussion	92 % (8 % neutral)
Having discussions in the subgroups was useful	75 % (8 %)	Starting the workshop in a small subgroup prevented meaningful discussion	50 % (42 % neutral)
The process of discussion was fair	100 %	The process led to some voices being heard more than others	42 % (33 % neutral)
The workshop was a valuable experience	83 % (17 %)	I did not enjoy the workshop	92 % (8 % neutral)
The activities aligned with the workshop goals	100 %	The activities did not help us meet the workshop goals	67 % (25 % neutral)
This workshop process was better than other workshop processes	58 % (33 %)	A different workshop process would have been more useful	42 % (33 % neutral)









*Figure S2: Figures summarizing the spread of results by participants for each question of the evaluation survey.*