Getting Down to Business: Using Speedstorming to Initiate Creative Cross-Disciplinary Collaboration

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Creative collaborations that cross disciplinary boundaries are essential to innovation. Individuals face challenges, however, in forming new collaborations. Empirical and anecdotal evidence suggests that the common formats of brainstorming and free-form networking are insufficient for enabling such collaborations to form. We present a potential solution called speedstorming, a pair-wise method of creative interaction similar to the round-robin 'speed-dating' technique. Speedstorming combines an explicit purpose, time limits, and one-on-one encounters to create a setting where boundary-spanning opportunities can be recognized, ideas can be explored at a deep level of interdisciplinary expertise, and potential collaborators can be quickly assessed. A comparison of speedstorming and brainstorming suggests that ideas from speedstorming were more technically specialized and that speedstorming participants were more certain in their assessments of the collaborative potential of others. This paper concludes with a discussion of the method's application in a variety of settings.

Introduction and Background

Creativity and innovation are fundamental to the survival and advancement of organizations, science and society. One of the most robust predictors of an organization's innovativeness is the occurrence of boundary spanning, where ideas from one domain, discipline or functional area are imported into another, in a way that solves new problems or presents new solutions (Burt, 2004; Rosenkopf & Nerkar, 2001). Rather than being a solitary enterprise, boundary spanning typically requires two or more experts to collaborate. Creative collaboration remains one of the most critical activities that managers and institutions can support.

Institutions invest heavily in breaking down organizational barriers to creative interdisciplinary collaboration. For example, departmental silos are often diffused by forming cross-functional teams (Ancona & Caldwell, 1992), and executive decision making is now often informed by participative decision making and brainstorming groups (i.e., De Dreu & West, 2001). Organizations have remodelled their physical spaces to encourage mixing between different units (Beckman & Lawrence, 2008).

Unfortunately, putting people with diverse perspectives in the same room is no guarantee that effective boundary-spanning collaboration will occur. Research suggests that even in the most unstructured social settings, people tend to interact mostly with others similar to themselves (Ingram & Morris, 2007) and discuss only information that is already shared by all participants (Stasser & Titus, 1985). Freedom from formal social structure seems to do little to increase the likelihood that people will forge boundary-spanning collaborations.

We argue that, paradoxically, by constraining and structuring social interactions, people from different fields can produce more technically specialized and relevant ideas. Furthermore, we propose that they are likely to leave the interaction with more certain assessments of the value of a larger number of potential collaborators than in traditional unstructured modalities.

This paper proceeds as follows. First, we discuss why boundary spanning is rare and

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difficult to encourage. Next we present an innovative method of creative interaction called speedstorming, which may be an efficient method for identifying new collaborators and exploring interdisciplinary ideas. By systematically structuring social interaction into many low-threat, high-engagement one-on-one conversations, speedstorming allows participants to quickly identify creative overlaps and assess interpersonal compatibility. Next, we contrast speedstorming with two of the most commonly used methods for forming cross-disciplinary collaboration: group brainstorming and freeform networking. We contrast the logics of brainstorming and freeform networking with the logic of speedstorming, including the principles on which it is based. Finally, we present data and observations illustrating the strengths and weaknesses of the speedstorming method. We close by detailing the mechanics of using the speedstorming format.

Why Boundary Spanning is Rare

Innovation occurs when experts recognize the analogous qualities of ideas from distant conceptual realms, identify ways they can be usefully connected, and work to realize them (Schumpeter, 1934; Hargadon & Sutton, 1997; Hargadon, 2003; Burt, 2004). The size and specialization of modern professional and scientific disciplines, however, makes finding the right conceptual bridge between domains difficult for any one individual to do on his/her own. Therefore, collaboration is required. Unfortunately, it is difficult to find new collaborators, a task that requires not only a match of ideas, but also of personalities. Even with supportive institutional structures, individuals must make a significant personal investment if they are to find collaborators and identify ideas worth pursuing jointly.

The process of finding new collaborators contains three phases, each of which is time consuming and without guarantee of success. In the *connection* phase, people from different areas must be connected with each other, often by coming to a place where new people can meet face to face. In the *qualification* phase, people must assess each other to ensure that there is substantive overlap in interests, work styles, goals and personalities. Finally, in the lengthy *follow-up* phase, the best matched potential collaborators begin planning joint pursuit of their most promising ideas. Only after these three phases have occurred can collaboration begin. For many people, the large investment of time and effort on the front end is not worth it, especially given the uncertainty about eventual payoffs.

Speedstorming

Speedstorming is similar in structure to the recent phenomenon of speed-dating. Since its origination in 1998, speed-dating has inspired a host of business-oriented adaptations, including speed-interviewing (Angelo, 2006) and speed-networking (McGregor, 2006). The term 'speedstorming' aims to set it apart as a topic to be formally explored and empirically investigated (as brainstorming has been).

Speedstorming uses a round-robin format for generating ideas and identifying potential creative collaborators. First, people are divided into pairs. The pairs can be matched based on certain characteristics (e.g., with each participant from a different discipline or department), or assigned at random, depending on the aims of the session. Pairs are given a focused topic of conversation, with the aim of generating ideas to pursue collaboratively by the end of each 3–5 minute round. At the end of the round, the pair finalizes their idea on paper, separately rates their impressions of their partner, and then moves on to their next interaction. By the end of the event, each person has generated ideas with several others, and in so doing was able to form initial assessments of each partnership's potential for productive and creative collaboration.

Two Alternatives to Speedstorming: Freeform Networking and Brainstorming

Various other forms of social interaction are commonly used to encourage boundary-spanning collaboration. Two of the most familiar are *freeform networking* and *group brainstorming*. Below we discuss the strengths and weaknesses of these two methods with regard to the formation of new interdisciplinary collaborations.

Freeform networking refers to any event where people convene with the express purpose of making new contacts, but where nothing explicit is done to facilitate that process. This includes coffee breaks at conferences, company socials and seminars given by professional organizations. These events serve several valuable functions, including socialization and the strengthening of social ties. It is often assumed that people from different backgrounds will mix naturally given such opportunities, and that mixers therefore encourage the formation of new interdisciplinary collaborations.

Unfortunately, there is much data suggesting that connections made in freeform networking are unlikely to be boundary spanning. The first reason for this lies in the kinds of connections people make. Specifically, in unstructured social gatherings, people are likely to talk only to people they already know or people from their own status groups (Borovoy et al., 1998; Ingram & Morris, 2007). People are more likely to approach others they have met before than they are complete strangers. Even cross-disciplinary conferences tend to be organized around specialty areas that encourage self-selection into more homogeneous groups with others of similar interests, rather than boundary-spanning ones.

The second limitation of freeform networking is that the conversations tend to focus on a variety of goals (such as status seeking, self-presentation and socialization) that can prevent participants from having the types of discussions necessary to assess each other's qualifications as potential collaborators. Conversation with strangers tends to be brief, polite and surface-level, and social norms do not encourage deep, critical discussions about ideas.

Brainstorming, on the other hand, benefits by explicitly sanctioning a discussion focused on generating boundary-spanning ideas. Brainstorming is a social form of idea generation based on the belief that groups will be most creative when criticism is forbidden, freewheeling is encouraged, the goal is to produce more (but not necessarily better) ideas, and there is an explicit goal to combine and improve upon the ideas of others (Osborn, 1953, p. 156). The assumption behind this practice is that, by removing the fear of being evaluated, stimulating one another with novel ideas (e.g., ideas that are new because they are not one's own) and removing traditional prohibitions against appropriating others' intellectual work, everybody will be able to generate more ideas, some of which will be truly creative (defined as novel and appropriate; Amabile, 1983).

Although brainstorming has been adopted widely and with fervour (Osborn, 1953; Prince, 1970; Jablin, 1981; Grossman, 1984; Grossman, Rodgers & Moore, 1989; Sutton & Hargadon, 1996), empirical research on its efficacy as an idea generation tool has been mixed. In particular, while individuals in brainstorming groups tend to *feel* more creative than individuals working alone (Rawlinson, 1981), their *output* is actually less creative. 'Nominal groups' – sets of individuals generating ideas independently – have been repeatedly shown to out-perform real groups (which interact face to face) both in terms of the raw number of ideas generated (Paulus, Larey & Ortega, 1995) and the originality of those ideas. Some have dismissed brainstorming as creating 'the illusion of group effectivity' (Stroebe, Diehl & Abakoumkin, 1992).

Many researchers have tried to identify the reasons behind productivity loss in brainstorming groups, such as *evaluation apprehension*, *social loafing* and *production blocking* (Diehl & Stroebe, 1987; Mullen, Johnson & Salas, 1991). Production blocking has received the most support (Mullen, Johnson & Salas, 1991). In production blocking, procedural concerns of allocating time and task participation amongst members interferes with individuals' generation and expression of ideas. Turn-taking between individuals in the group both prevents the sharing of new ideas as they arise (Diehl & Stroebe, 1987, 1991), and interferes with the cognitive processes involved in generating ideas (Nijstad & Stroebe, 2006). Blocked communication makes the qualification of potential collaborators unlikely.

Identifying collaborators and generating boundary-spanning ideas are key to interdisciplinary research. Knowledge sharing between group members with diverse but overlapping knowledge sets is a characteristic of successful scientific research groups (Dunbar, 1995). However, groups that contain highly specialized members from non-overlapping fields face many challenges. Disciplinary boundaries can hinder connection and qualification of potential collaborators in any social setting, and brainstorming and freeform networking are no different. First, disciplines have their own assumptions, 'languages' (Maznevski, 1994), values and identities, which can make understanding and building upon each other's ideas difficult. Group settings can discourage members from asking for clarification because evaluation apprehension and social norms of conversation discourage personal requests to pause. Thus, in diverse groups of experts, conversations may be poorly understood or irrelevant to many participants much of the time.

Second, the unique character of interdisciplinary groups likely exacerbates some of these problems. Groups whose members' knowledge sets are highly diverse are not likely to discuss the broad range of ideas about which they are fluent as individuals (Gigone & Hastie, 1993; Stewart & Stasser, 1995). Instead, the breadth of expertise in interdisciplinary groups can actually lead to unfocused conversations while the group moves from one topic to the next, exhausting the most obvious ideas in the categories they can explore together (Larey, 1994; Paulus, 2000). In short, a lack of common ground may force members to

explore ideas at the 'lowest common denominator' of knowledge similarity. Conversely, when discussions *do* become more in-depth, the diverse expertise among group members means that more time will be spent on topics irrelevant to any given person.

We do not wish to argue that freeform networking and brainstorming are without value. An in-depth case study at the design firm IDEO revealed that, while brainstorming groups may not produce a higher quantity of ideas or even better ideas, brainstorming serves other important purposes for organizations, such as providing a forum for awarding status based on valued behaviours, sharing knowledge, generating income for the firm, etc. (Sutton & Hargadon, 1996). They are not, however, optimal when the goal is identifying collaboration opportunities developing diverse boundary-spanning ideas.

Comparing Speedstorming to Brainstorming

We conducted an experiment to compare the effectiveness of speedstorming and brainstorming on their ability to (1) connect and qualify collaborators and (2) produce high-quality ideas. (The structural differences between the methods influences the number of ideas generated, but because this is not germane to our argument, we do not compare brainstorming and speedstorming on idea quantity.) Freeform networking is not included in this comparison since (a) as just reviewed, there is ample evidence that substantial interdisciplinary mixing is unlikely to occur, and (b) given that idea generation is not a specific aim, we would expect few if any ideas to result. Furthermore, short of unobtrusively recording every conversation, we could not reliably assess the ideas without fundamentally altering the normal course of the activity.

The setting was an event we hosted before a university-sponsored grant competition for innovative ideas. We targeted the event at students interested in entering the competition under the division of 'bio-innovation', a burgeoning interdisciplinary field that attempts to mimic or employ biological phenomena to produce practical effects. We advertised the event to graduate students in biology and engineering as a way to generate ideas and find collaborators.

We split the 27 participants into two groups, one that would begin with speedstorming and the other that would begin with brainstorming. Each group consisted of equal numbers of biologists and engineers. Speedstorming participants rotated through seven biologist–engineer encounters of five minutes each, generating an idea each time.

In another room, brainstorming participants generated ideas in two groups *each* of six and seven, so that groups would not be too large to be productive (see Mullen, Johnson & Salas, 1991, for a meta-analytic review of group size and brainstorming productivity research). Before beginning, a researcher familiar with Osborn's (1953) brainstorming guidelines encouraged the group to follow a set of brainstorming rules including 'no judging', 'aim for quantity', and 'build on each other's ideas'. Once the groups were started, the researcher was not involved in facilitating the discussion. We felt that this level of intervention approximated brainstorming as it occurs in typical applications (e.g., some knowledge of protocol but no designated or trained facilitator).

After the first 50-minute session, participants rated their experience and the people they met before moving on to try the other method (brainstorming or speedstorming) in the second session. They compared the two methods in a final survey. Because several participants from both groups needed to leave the event during the second round, we analysed only the data from the first session; this also avoids potential spillover effects.

Anecdotal Data

Anecdotal reactions and comments about brainstorming and speedstorming highlighted the differences between these two techniques, and suggested speedstorming's potential for connecting with other disciplines. (As a precaution, such reactions illustrate the specific experience of these groups' members, but it is not appropriate to generalize from these remarks.)

After brainstorming, participants wrote down their reactions, which in the majority of cases mentioned that the lack of a 'prompt' was challenging: 'It seemed that not everyone was on the same page regarding what type of innovation we were intending to do', and 'Probably not the best method of idea generation – a bit scattered, could have used a bit more form'. Several mentioned 'lulls sometimes' and a lack of participation from some members: 'A couple of people were really interesting and creative, a couple didn't quite seem to get it', and 'two participants were really shy'.

Participants' subjective reactions to the speedstorming technique were often positive, such as, '[It was] fun and amazing to hear about various projects and look for intersections', and '[It's a] low cost method of meeting

as many potential collaborators as possible'. Challenges included bridging disciplines ('it was challenging coming from another "level" – say populations and individuals rather than peptides and genes') and managing time ('It took a couple of rounds to realize how quickly we needed to jump into the innovative ideas, but once we got the hang of it I was surprised with the creativity that we had, possibly as a result of the . . . pressure to think now, and not wait till later'). The short time frame was considered a benefit to some: 'More efficient for idea generation than brainstorming'.

Finally, speedstorming participants reported gaining a different perspective on their own research by iteratively explaining it to different people in rapid succession: 'It helps you think of your own project in completely new perspectives by explaining to people of other disciplines', and 'I noticed that I was getting better at describing my own project to others, and that the description itself took on a wider and more interdisciplinary feel'.

Identifying Collaborators

After each session, participants rated each person they met by answering 'I would like to follow up with them about doing research after today's event: No, Probably Not, Maybe, Probably, or Yes'. The effectiveness of each technique in identifying collaborators was measured by counting the number of *mutual ties*, wherein both participants independently agreed on whether or not they would follow up.

Figure 1 shows these results after removing those who had either already collaborated, or knew each other before, adjusting for the total number of mutual ties possible in each session.

A 'Maybe' response means that even after the interaction, participants were uncertain about the qualifications of the other person as a potential collaborator. Figure 1 shows that many dyads in the speedstorming group expressed mutual positive ties – meaning both participants were certain they wanted to follow up – none were expressed by the brainstorming group. The same effect was observed for negative mutual ties; while many dyads in the speedstorming group expressed mutual negative ties (both participants were certain they did not want to follow up), the bulk of brainstorming responses were 'Maybe', indicating uncertainty.

These results suggest that speedstorming is a more effective means for qualifying potential collaborators than brainstorming. While speedstorming participants were often certain of each others' suitability or lack thereof as collaborators for each other, the frequency of 'Maybe' matches in brainstorming suggests that dyads who participated in that form of social interaction were unable to qualify or disqualify potential collaborators with any certainty.

Generating Ideas

We were also interested in the effect of the social interaction method on the ideas or proposals generated. In order to assess the quality, creativity and content of the ideas, we developed an online idea-rating tool, CATER (Jennings, 2007), to facilitate the rating process. The raters rated the proposals, among others, on 'Business and Practical Usefulness', 'Specificity', 'Comprehensibility' and 'Demonstration of Specialist Knowledge'. (A pilot test of our rating tool revealed that these ideas were too difficult to rate on creativity, as assessing the

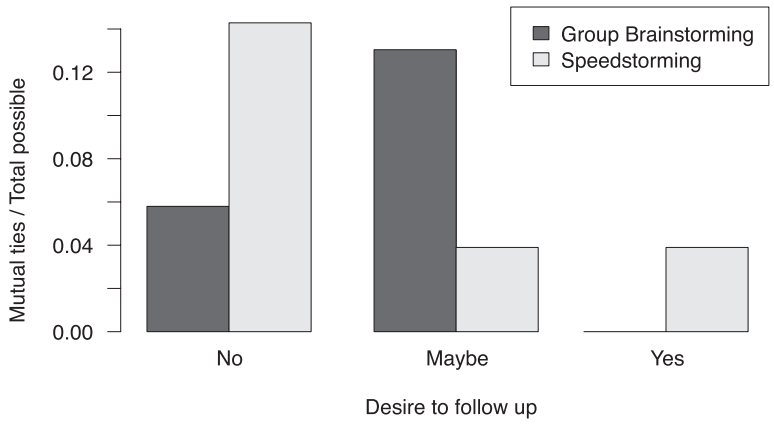

Figure 1. Certainty (Yes and No responses) vs. Uncertainty (Maybe responses) of Intention to Follow Up

Table 1. Constructs and Definitions for Proposal Rating

Construct	Definition
Business and practical usefulness	Assuming the idea was implemented, it solves an important real-world problem, supports strategic goals in business, or generates revenue or market share. Having beneficial impact, applicable utility if implemented.
Specificity	Concrete, detailed, and precise. Not vague, abstract or unclear in meaning.
Demonstration of specialist knowledge	Shows understanding of and makes use of knowledge from one or more disciplines, going beyond what could be done by an educated person who has not studied that field.
Comprehensibility	Whether you (personally) are able to comprehend the idea, considering both how it is expressed and your own knowledge of the concepts it uses.

Table 2. Proposal Rating Results

	ICC	BS	SS	*t*	*df*	*p*
Specificity	0.49	2.70	2.57	0.49	34.03	0.624
Comprehensibility	0.53	3.98	2.65	6.02	42.33	<0.001
Demonstration of specialist knowledge	0.53	2.26	3.05	–2.73	30.35	0.010

ICC = Interclass correlation coefficient, BS = Brainstorming (Mean), SS = Speedstorming (Mean).

novelty of the proposal required broad familiarity with not just one, but two specialized disciplines). Table 1 defines each construct.

Three raters first read through the constructs and their definitions, and then read each idea presented in a random order. They were then presented with each idea in turn and rated them on each construct. Each rater used the constructs in a different order, but that order remained consistent throughout the session. The interclass correlation (ICC) agreement indexes for 'Business and Practical Usefulness' were too low for reliable results (0.43). With the remaining constructs the results were then compared between brainstorming and speedstorming using Welch's two-sample *t*-test with unequal variances. The results are shown in Table 2.

Ideas generated in the speedstorming group showed more specialist knowledge and were less comprehensible to an educated layperson than ideas generated in the brainstorming group. (The correlation of these two ratings was $r = -0.49$, $t(52) = -3.61$, $p < 0.001$.) There was no difference in specificity between groups. These results suggest that while speedstorming and brainstorming produce ideas at about the same level of specificity, speedstorming produces ideas that are more specialized and technical. Thus, it appears that speedstorming does indeed allow participants to make more productive use of their expertise, and possibly produces ideas that make better use of boundary-spanning intellectual resources.

That said, some qualifications are required. First, this procedure compared facilitated speedstorming to unfacilitated brainstorming. It is likely that the results would have been different had an expert facilitator been available to assist the brainstorming groups in observing the rules of brainstorming and in recording their ideas. Our intention, however, was to compare these two techniques in the manner they would likely be practised in organizations, where trained facilitators are a luxury. Though speedstorming essentially requires a facilitator, this person does not need any special expertise to be effective (as detailed next). What's more, one facilitator can

work with a much larger group than is practical in brainstorming – at another speedstorming event, one facilitator successfully led a large banquet hall of approximately 100 participants.

Second, we recognize that brainstorming was not designed to facilitate connections. Again, we do not intend to replace brainstorming, but rather to offer a more nuanced understanding of its strengths and weaknesses with regard to this important objective. In fact, combining brainstorming with speedstorming may offer interesting benefits. Future research should evaluate the effects of combining structures of social interaction in different sequences and proportions before we can definitively suggest the optimal set-up for encouraging interdisciplinary collaboration.

Finally, for reasons detailed previously, we do not compare speedstorming to freeform networking. As with brainstorming, it could be that speedstorming could be productively combined with traditional networking, perhaps as an initial activity that can overcome the inherent difficulties of mixing people from different groups. A networking period could also allow more detailed follow-up of promising speedstorming conversations. This is another area worthy of future research.

Principles of Speedstorming

In this section, we present the theory behind speedstorming. Three properties of this form of social interaction make it more effective at sparking new creative collaborations than either freeform networking or brainstorming: purposeful mixing, time limit and structure.

1. Purposeful Mixing

Speedstorming is a structured social interaction that makes the specific purpose of the interaction explicit: finding boundary-spanning ideas and creative collaborators. This shared goal gives speedstorming substantial advantages over, for example, a conference interaction, where people may have widely different purposes for attending. The conversation stays focused and relevant to both parties, and validates them in getting down to business quickly.

In contrast to the often shallow exchanges found at conferences or in brainstorming, enforced structure regarding the information to share, the mix of expertise and the one-on-one encounter results in the ability to 'go deep' into one's interest areas in a short space of time. The stated purpose of the event and the presence of a facilitator 'gives permission' for people to candidly share their interests and expertise rather than conforming to social norms of 'making small talk.'

The pairing of participants in a speedstorming session ensures each person will have the maximal opportunity to interact with people from other areas. It also means the diversity and number of ideas each person will be exposed to will, on average, be greater. This is because while mingling might lead to being 'trapped' in a conversation, and brainstorming might result in one topic being explored past the point of diminishing returns, speedstorming ensures that each person will hear as many different ideas as there are pairings in the session. Even if no collaboration opportunity is identified, each participant has been exposed to a greater range of ideas when they leave the interaction.

2. Time Limit

Speedstorming greatly benefits from a strictly enforced, short time limit. Interactions of five minutes or so minimize the risk of engaging with an unsuitable person – if your interests or personalities are not a good match, then the interaction will be kept to a minimum and time freed to spend searching for other collaborators.

Short interactions also leverage our abilities to assess a situation. When we sense danger, read a stranger, or react to a new idea, we tap our 'adaptive unconscious' to instantly evaluate a complex situation. Gladwell (2005) refers to this as 'thin-slicing'. Much of what makes speedstorming effective is that collaboration compatibility can be assessed as powerfully in the first several minutes of an encounter as it can over a much longer period of time – one can simply 'cut to the chase.'

3. One-to-One Encounters

Speedstorming is made up of successive one-to-one encounters. Unlike networking conversations, no one else will join the conversation, and unlike brainstorming, there are no large group dynamics. This offers several advantages.

Relevance

Such dyadic interactions create what Goffman (1963) calls a 'focused interaction', where all attention is between the two participants. As each participant is always either talking or listening, they are fully involved all of the time. This helps keep the interaction relevant to each of them.

Complexity

Because interaction is consistently relevant to both participants, one-to-one encounters greatly reduce the 'lowest common denominator effect' observed in brainstorming. In other words, because groups tend to discuss only shared information (Stasser & Titus, 1985), conversation stays at a level general enough to appeal to the majority of the members. When groups are composed of specialists from various domains, this can result in either near silence or high-level small-talk – not the production of specific, concrete new ideas. In contrast, conversation in one-to-one interactions like speedstorming goes deeper into more complex areas of intersection between two specialties.

Neutrality

Brainstorming groups can also serve as 'status auctions' (Sutton & Hargadon, 1996), where a participant's performance in brainstorming sessions influences their prestige and power within an organization. Similar dynamics occur in networking. The lack of observers in one-to-one encounters like speedstorming minimizes the influence of status-related goals on behaviour.

Talk Time

One-to-one interactions also offer solutions to many of the problems typically associated with lower productivity in brainstorming groups (Diehl & Stroebe, 1987). First, an audience of one should also generate less evaluation apprehension than an audience of many, thereby encouraging participants to be more open and to share more novel or speculative ideas. One-to-one encounters also help minimize production blocking, the key factor in productivity loss in brainstorming groups (Diehl & Stroebe, 1987; Stroebe & Nijstad, 2004): if each member has equal time, each participant in a pair can speak 50 per cent of the time, while in a ten-person group each participant is only able to speak 10 per cent of the time.

Reduced Interdisciplinary Boundaries

Finally, one-to-one encounters are less likely to suffer from the unique challenges of interdisciplinary research. First, one-to-one exposure to members of another discipline helps to personalize them, removing some of the stereotypes that might have been held about the out-group. Second, there is no audience, and hence diminished pressure to defend one's discipline or denigrate the other. Third, it is possible to share reactions and ask questions immediately and privately, rather than waiting for a break in the conversation.

Applications

As a practical tool (see Table 3), speedstorming is intended to enrich rather than replace existing collaborative methods. At conferences for instance, speedstorming events could facilitate otherwise unlikely connections – kick-starting the mixing process when interactions are less structured. Starting a brainstorming session with a few rounds of speedstorming could give each person a chance to talk through their ideas in a less threatening setting, and would also establish a broader base of ideas to initially build from.

Beyond obviously creative domains, speedstorming is a process with many potential applications. Examples include getting interdependent work groups on the same page about projects or initiatives, and encouraging employees to share targeted updates on their current projects with each other in a deeper and more personally relevant way than is typical of casual water-cooler interaction.

Conclusion

We have argued that speedstorming, a novel structure of rapidly rotating dyadic conversations, can improve the quality and efficiency of a variety of social interactions, whether or not participants were acquainted. It addresses the potential lack of depth in brainstorming and freeform networking, minimizing distractions and dilution from attending to many goals simultaneously. The short time limit and one-to-one nature of the encounters combine to ensure that the conversation stays relevant to each participant, thereby maintaining their engagement. The result is a higher potential for generating creative, high-quality interdisciplinary ideas, and forming more productive collaborations.

While future research needs to explore this assertion further, this paper illustrates speedstorming's promise. By structuring social interaction, speedstorming can enable specialists from different disciplines to connect with and qualify each other as potential collaborators in a way that is engaging, relevant and efficient, making follow-up more likely. Busy experts can expect a high payoff from a relatively low investment, which just may be the

Table 3. Things to Consider When Planning a Speedstorming Event

- **Goals:** What are the goals of this session (e.g, idea generation, tackling a specific problem, connecting people)? Feedback from participants in our first few trial events suggested that speedstorming interactions were more productive, diverse, efficient and engaging when the group was given an explicit focus. Clearly stating the purpose of the event frees participants to pursue those goals without concern about breaking social norms.
- **Participants' prior experience together:** There are pros and cons to speedstorming with people that already know each other. If participants have never met, give them a few minutes to chat before beginning. Becoming familiar with each other's names and faces for a few minutes at the beginning of the event will allow speedstormers to dive into each interaction straight away by saving time on introductions.
- **Incentive alignment for collaboration:** Speedstorming is probably unable to overcome significant structural barriers to collaboration, such as if reward structures do not consider collaborative work or if funding is unavailable to follow up with projects. Speedstorming is a good fit when collaboration opportunities are possible afterwards.
- **Disciplinary and status mix:** An event to encourage interdisciplinary collaboration with a room full of experts from only one field is unlikely to result in boundary-spanning ideas. Consider the mix of participants you have at the event and arrange for different disciplines and functions to meet each other during the session.
- **Length:** Length should ultimately be determined by the purpose of the event, which should always be made explicit from the beginning. It is likely that no matter how many minutes are given per round, participants will want more time. We have found that ideal sessions run between 15 and 30 participants, depending on the mix of disciplines. This allows enough five-minute pairings to stimulate interest without wearing people out. Four-minute pairings can be effective if participants already know each other. For example, pairing 30 people, e.g., fifteen each from engineering and biology, means 14 encounters with someone from the other field ($14 \times (5 \text{ minutes} + 1 \text{ minute for change over}) = 1 \text{ hour } 24 \text{ minutes}$).

  If the purpose of your event is to form new collaborative relationships, the length should be long enough for each pair to identify whether they have an idea that they could pursue together in the future, and to get a basic sense of whether or not they would want to talk to each other again. It will not be enough time to create a thorough proposal. If, on the other hand, the purpose of the event is to finish with more fully developed idea proposals, offer more time per round with fewer rounds per event. Keep the total time between 45 minutes and an hour and a half. Beyond that, fatigue can hurt participant motivation, satisfaction and the quality of the interactions and ideas.

push that deeply embedded institutions need to break through the barriers to boundary-spanning innovation.

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