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Soundstorm, a collaborative ideation game for sound-driven design

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ABSTRACT

The sound-driven design approach foregrounds the human-centred sonic, experiential and cultural aspects of listening. However, addressing the temporal and context-dependent nature of sound in multi-stakeholder, collaborative design projects is a challenging activity. Ideation methods are used to generate solutions to a design problem. During idea generation, participants use their creative cognition to generate ideas in quantity, quality, variety, and originality. If this collaboration is managed effectively, a group outperforms its members. We present Soundstorm, a collaborative card game to sensitise group-work in sound-driven generative design sessions. A pilot evaluation using a protocol study with 18 participants showed the potential of Soundstorm in facilitating iteration among team members. The study highlights the importance of putting effort and attention into preparing participants for productive generative sessions.

CCS CONCEPTS

• **Human-centered computing** → *Interaction design process and methods*; • **Applied computing** → *Sound and music computing*.

KEYWORDS

Sound-driven design, group ideation, sonic expression

1 INTRODUCTION

Sound-driven design is a collaborative and participatory act of developing solutions to address sound-induced issues and opportunities in a specific context [11, 27, 36, 62]. In sound-driven design, human-centred, collaborative and listening-centred approaches [23, 45, 53]

are at work to provide users and stakeholders with an effective shared ground of creation and discussion [10]. However, not all listeners experience and respond to the shared acoustic environment equally due to their functional role in that environment and the listening attention required for their task at hand [37]. Moreover, even experts that are experienced in sound-driven design projects have different interpretation of what 'sound' entails for their job. Therefore, navigating design decisions for the listening experience requires a more complete integration of all involved stakeholders during the sound-driven design process [12].

From a design methodology viewpoint, the final hurdle for sound-driven design is the semantic gap (i.e., shared ground within a design team or participating experts in relation to designable concepts) emerging between the conceptualisation of sound and its embodiment [11]. This gap is not unique to the sound domain but shows up across design domains [20, 59]. Sound professionals are expert at bridging this gap [21]. Sonic lexicons and accessible sound concept tools are progressing and becoming more accessible [6, 16, 58].

Constructing an empathetic and context-aware shared cognition is a prerequisite for successful collective ideation processes, especially when multidisciplinary design input is required [1]. However, such professional skills, sound-specific knowledge, and sonic awareness are underdeveloped in young and learning sound designers or might lack in professionals who participate in sound design processes incidentally. In this paper, we explore possibilities to include such professionals lacking expertise in the sonic ideation processes and support them with an ice-breaker intervention that makes sound-relevant activities more accessible. To do so, we conceived Soundstorm, a collaborative card game designed to sensitise members of a design team to sound and prepare them for sonic ideation in generative design sessions.

1.1 Sonic ideas and means of expression

In the context of this work, by sonic idea we mean an idea that has been shared with others, often during group ideation stage of a design process, and that relates to product sounds. Hence, a sonic idea might focus on a specific attribute of the listening experience [54], that is:

- A sonic idea focusing on the **causal** attribute would refer to the source of sound and express the sound-producing event or technical process and their (physical) configuration;

- A sonic idea focusing on the **functional** attribute would refer to the purpose of the sound for the users in their context and may express why or when sound should occur;
- A sonic idea focusing on the **semantic** attribute considers the listener-centred perspective in meaning-making, including values and beliefs. In this case, a sonic idea would stress the contextual and cultural factors of sound-makers and users;
- A sonic idea focusing on the **empathetic** attribute entails a reflective, sound-centred perspective and would characterise the intended sound in terms of affective, emotional and perceptual similarity to other referent sounds.

Sensory experiences are intertwined in reality though, and the attributes represent different perspectives on the experiential qualities of sound that need to be considered in the design process.

A means of expression is the communication method through which a (sonic) idea is shared with other people. For example, the brainstorming method uses verbalisation as the means of expression [34], whereas brainwriting uses pen and paper [57]. These approaches are often developed for verbal and visual expressive needs, but are applicable for sonic expression needs as well. The choice of the means of expression implicitly sets a constraint on the sonic idea output, e.g., in normal conversation, a verbal means of expression can be occupied by one person at a time, and this takes effort, although in brainstorming sessions participants might be encouraged to talk over each other [42]. In this study, we focus on two means of expression, verbal descriptions of sound (i.e., any verbal description of a sonic idea), and vocal sketching (i.e., any vocal imitations of a sonic idea), which are immediately accessible and available for use [18, 31].

We frame our work in the pedagogical approaches and methods to practising means of expression, language, and prototyping skills in sonic interaction projects [13, 22, 40]. The paper is organised as follows: In Section 2 we briefly frame group ideation and its dynamics with respect to the basic traits of creativity; we present Soundstorm in Section 3 along with its conceptualisation and rules set; Section 4 reports the initial evaluation of Soundstorm in an in-between group study with 18 participants, where the protocol analysis of brainstorming sessions is used to assess indirectly the effectiveness of the Soundstorm intervention; we discuss the results in Section 5 and draw our conclusions.

2 GROUP IDEATION

Within the double diamond of the generic design model, group ideation is one of the tools for diverging ideas during a design process [56], typically to define a problem and generate solutions to it, and in any case whenever divergent thinking is needed. Group ideation takes place in generative sessions, a time-constrained activity, focused purely on using the creative thinking of a group to get divergent results over a problem statement [41] . The outcomes are then refined and combined in iterative cycles of evaluation and design. Generative design methods imply a set of rules to support the group ideation. By providing structure during the session, and agreement on behaviour during the session, the method should lead to more productive sessions [60].

The problem statement is central to the start of generative sessions. In a sound-driven design process, all stakeholders would be involved in shaping the problem statement. A participant's initial perspective on a problem statement directly influences the solutions space they generate in their mind [4, 39]. This means that once a solution space has been generated, it is difficult to change it in the span of a single ideation session. If this generated solution space is small or misses the mark, the ideas explored will also be narrow [8]. The structure and the specificity of a problem statement are key factors affecting the generation of the solution space, together with the possible preconceived cultural background of the participants [25, 49].

2.1 Types of creativity and group ideation

Creativity is a universal trait of humans, not limited to certain disciplines or special individuals. Creative individuals are used to ambiguity [61] and are less pressured to conform [51]. To designers' advantage, creative skills and capacity for mental imagery can be trained, by focusing on open-mindedness and encouraging exploration [47]. Group ideation techniques support individuals' mindset in problem-solving and resolving ambiguity making them trained for creative thinking. Typically, there are three types of creativity [5, 26], that is generative, combinatorial, and transformative, as depicted in Figure 1 .
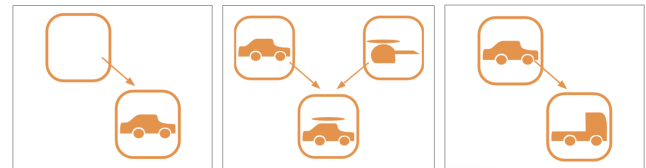
Figure 1: From left to right, depiction of generative, combinatorial and transformative creative ideas.

Generative creativity involves generating entirely new ideas or elements from scratch, like starting with a blank canvas and painting a unique masterpiece. This type of creativity is focused on creating something novel, often by imagining possibilities that have never been explored before. Combinatorial creativity rearranges existing ideas or elements in new and interesting ways. It is like taking pieces from different puzzles and putting them together to create something unique. This type of creativity is all about finding connections between things that might not seem related at first. Finally, transformative creativity involves reshaping and fundamentally changing existing ideas or elements in innovative and profound ways. It is like taking a familiar object and completely reinventing its purpose or form. This type of creativity is about changing existing ideas into new uses or better versions. Creative thinking methods take advantage of these three creativity types to help structure idea generation [17, 24]. Similarly, we make an instrumental use of this basic subdivision of creativity as rationale for evaluating the sensitisation effect of Soundstorm (see Section 4.

Complementary to creativity, generative methods may focus on activating cognitive flexibility, persistence or some combination thereof to foster creative fluency (number of ideas or insights) and

originality (novelty) [9]. Persistence forces cognition to explore ideas, by supporting production and quantity of ideas. This can also be seen as putting in hard work, to be creative. Flexibility, on the other hand, allows the formation of loose associations in cognition, thus facilitating unique connections and the creation of original ideas. These two cognitive processes are somewhat inter-linked, that is when putting effort into persistence, flexibility lowers and vice-versa. It is possible to activate and practice both persistence and flexibility, thereby increasing the creative output, e.g. by using time constraints and / or favouring ideas sharing during the session. Similarly, persistence and flexibility can be primed respectively through negative or positive moods before the idea generation [33].

During collaborative ideation tasks, creativity emerges from the interplay of individual cognition and social interactions [48] and can lead to more novel and innovative solutions deriving from individuals' different expertise and background, and diversity in views [38, 46]. Collective creativity means that groups can perform better than the sum of their parts, but only if this collaboration is managed effectively. Generative design methods [44] do this by providing groups with a structure during ideation.

2.2 Synergistic and interference effects in group ideation

The beneficial and detrimental aspects of group ideation can be clustered into Synergistic and Interference effects [14]. Most of the synergistic effects derive from idea exposure. For instance, exposure to new ideas increases the number of novel associations a group can make and potentially the quantity of ideas generated. Over exposure, however, can lead to a reduction of ideas due to the too high cognitive effort to take in too many ideas [7]. Conversely, when a participant is unable to express an idea, production blocking acts as an interference effect for the creative process decreasing the number of expressed ideas. This often happens during verbal techniques, when participants must wait or claim their turn to talk, or when a participant is unable to transfer their idea to the means of expression used, such as an inability to draw conceptual ideas [15], or in case of sonic expression, the difficulty to externalise the sonic concept held in the mind.

3 SOUNDSTORM: FACILITATING SONIC EXPRESSION DURING GROUP IDEATION

The exposure to ideas and the blocking of idea expressions can be particularly relevant in sound-driven design. In most generative session methods these effects are controlled through visuo-spatial means such as boards, but this is not desirable for sound-driven design. Indeed, as sound-driven design relies on designing for listening, the focus should be on ideas and concepts expressed auditorily [30].

Improving idea exposure and production blocking can be done by focusing on interventions aimed at preparing participants for an existing generative session methodology [2, 3]. Implementing a preparatory activity allows teams to continue using their preferred generative methods during the design process. Therefore, we developed Soundstorm as an ice-breaker (i.e., sensitisation) tool for facilitating and sustaining sonic expression during group ideation. Soundstorm has been designed to explore playful ways to keep

sonic creativity and motivation up amongst inexperienced sound designers who are interested to express their ideas, but can simultaneously feel blocked due to lack of practice with sonic expression tools.

3.1 Soundstorm design rationale

Soundstorm is a board game in which participants practice the expression and sharing of sonic ideas, as a preparatory intervention to improve idea exposure and reduce production blocking in the absence of any actual design need. It is a quick and fun collaborative card game, played by 2-5 people focusing on the generative session itself. During the game, players express sonic ideas for a given hypothetical product, based on cards they draw from the pile. This practices their expression skills for sonic ideas [13]. Furthermore, it engages the player's persistence and flexibility in creative thinking [33], which should improve the player's creative cognition in the short term [19].

Board games are effective learning means to achieve a feeling of social cohesion amongst the players, thus working as a social icebreaker [52, 55]. Collaborative board games foster player engagement, especially when there are players averse to direct competition [32].

3.2 Conception of Soundstorm

Expert interviews (approx. 30 minutes) with serious game designers (n=3) and board game designers (n=2) were analysed and used to seed the Soundstorm design concept. In general, Soundstorm focuses on two main types of idea prompts, related to the modes of listening [11, 54] and product sound categories [35], respectively. By means of iterative cycles of design, the rule set developed from the simplest play concept using randomness (e.g., throwing dice) as a game input for generating the idea prompts which players must complete under some form of time pressure. Completing prompts results in points shared by all players, in which the goal of the game is to score the highest points. This play concept makes the personal impact perceivable and controllable [29], making it a good motivator for simple games. In the context of a collaborative board game for ideation purposes, simplifying the task means simplifying the turn of players, as well as reducing their decision-making, in order to concentrate their attention on the fulfilment of the prompt [43], that is engaging the players' mental persistence and flexibility. Removing explicit individual goals and contributions in turn helps to reduce inter-player tension during the game.

3.3 The game

A game lasts three minutes, and it is played around two main sets of cards, the **product cards** (n=20) and the **sound cards** (n=60). First the product cards are shuffled, and the product in the card on top is revealed. This product is the subject of the current Soundstorm game. Then the Soundcards are shuffled, and the timer is flipped. Players take turns one at a time, revealing and performing the task in the sound card on top. After three minutes, all the completed cards are counted, thus representing the score.

3.4 Product cards (20)

Product cards are the subject of a single game of Soundstorm. Therefore, players focus on creating sound ideas for the product on the Product card (e.g., clock, stroller, pencil, fridge, etc.). In this way, combining odd sound descriptions (e.g., energetic and clumsy) with a product is what makes Soundstorm work as a preparation game: Forcing the player to answer their turn primes their persistence, while matching the product card to a sound card primes their flexibility. This card set includes common household items with different degree of difficulty, that is with varying levels of intentional and consequential sounds [28]. A clock is known for its intentional sounds (e.g., the alarm) but also has consequential sounds (e.g., ticktock). A bookcase on the other hand is not known for its sounds, though it can produce consequential sounds which are more demanding to conceptualise. This distinction is also reflected in the final scores, since a difficult product card leads to a lower final score.

3.5 Sound cards (60)

Sound cards foster players to think creatively about sound by practising both verbal descriptions and vocal scribbles of sonic ideas. Sound cards are organised in **Make**, **Describe** and **Find a Function** prompt types, shown in Figure 2.

Figure 2: From left to right, examples of Make, Describe and Find-a-function prompts.

The **Make** and **Describe** types are based on causal and empathetic aspects of sonic ideas, whereas the **Find-a-function** type foster functional and semantic associations. Finally, two additional types, **Repeat** and **Replay**, encourage interaction between players during a game of Soundstorm.

For the purpose of practising sonic means expression, it is essential that players encounter the Make, Describe, and Find-a-function card types during their play session. The **Make** and **Find-a-function** card types have the highest impact on the learning goals (i.e., practising persistence and flexibility in expressing and sharing sonic ideas). The odds of drawing a specific card type, and thus the distribution of card types in the deck should reflect the learning rationale. Therefore we used a hypergeometric distribution probability to make sure that the chance of not drawing a Make, Describe or Find-a-function card was lower than 5%, while the odds of encountering a Make and Find-a-function card was set around 70%.

3.5.1 Make (17) and Describe (13) cards. To complete a **Make** card, the player must vocalise the corresponding sound, relative to the product card drawn at the beginning of the game. Make cards keep the players engaged in practising scribbling through vocalisations [13], which can be resourceful during the generative session.

Further, the Make cards facilitate the association of causal and empathetic descriptions of sound and their embodiment, by building a minimal expertise and trust in using vocalisations to express sonic ideas. The Make cards are at the heart of Soundstorm and represent the most fun card type. In this respect, they act as an important ice-breaker that pulls players over the initial awkwardness and lifts spirits.

In **Describe** cards, causal and empathetic aspects of sonic ideas are practised through verbal descriptions. Verbal expressions for sound already play a major role in design teamwork. These cards facilitate a means of expression that is already common and shared, and provide an opportunity to refine this skill, by proposing difficult words. The Describe cards are less important than the Make cards, therefore their distribution is slightly smaller than make cards.

3.5.2 Find-a-function cards (16). Contrary to the other card types, Find-a-function cards contain sound descriptions. The player must think up a function displayed through the sound description, and attached to the product at hand. This card type focuses on the functional and semantic aspects of sonic ideas. By stressing the human aspect of sound-driven designs, the Find-a-function cards challenge players to consider the listening experience during sound-driven ideation.

3.5.3 Repeat (4) and replay (7) cards. Repeat and Replay cards ensure that players pay attention to each other during a game of Soundstorm, which would have an effect during a generative session. The Repeat card requires the player to recall and repeat the answer given by the prior player. The Replay card serves as element that adds the iteration on each other's ideas instead.

4 PILOT EVALUATION

Soundstorm is designed as a sensitisation activity to increase the idea exposure and reduce the production blocking that occurs during a generative session. Its effectiveness should be reflected in the ideation outcomes of a generative session. Therefore, we devised a pilot evaluation to answer the following research questions:

- Does playing Soundstorm increase the number of ideas generated during a generative session?
- Does playing Soundstorm influence the type of creativity used during a generative session?
- Does playing Soundstorm increase the use of vocal scribbling to express their sonic ideas during a generative session?

The study used brainstorming as the generative session methodology. In the context of sound-driven design, the auditory nature of brainstorming is seen as a significant advantage, facilitating the direct expression of sonic ideas [40]. Brainstorming rules are simple, the focus is on the quantity of ideas, whose building is facilitated by suspending the feedback. Wild and crazy ideas are encouraged. In other words, we make use of brainstorming as means to observe if playing Soundstorm beforehand has an effect on idea exposure and production blocking in group ideation. Further, we are interested in testing a protocol analysis approach as methodology to assess the effectiveness of sensitising interventions aimed at preparing participants to generative sound-driven design.

Table 1: Problem statement

Enhancing campus experience through innovative clock sound design for Delft University of Technology's 70th Anniversary Celebration
Client: Deft University of Technology (TU Delft)
Mission: Integrating the mission of TU Delft into the fabric of campus life, we aim to celebrate the 70th anniversary of our largest building by introducing an iconic clock sound audible throughout the campus during the Spring and Summer of 2025.
Problem statement: The clock sound will be a distinctive feature honouring the historic clock tower. The TU Delft campus serves as an ideal space for fostering interdisciplinary interactions among students and staff. The campus includes a variety of elements such as bus lanes, bike lanes, sidewalks, and a park, creating a dynamic environment. We seek multiple creative ideas for the character, purpose(s), and implementations of the clock sound. This initiative aims to contribute to the unique atmosphere on campus, aligning with TU Delft's commitment to innovation and collaboration.
Users: Students spend significant time on campus. During breaks, they gather outdoors, enhancing their connection to the campus environment. **Faculty and staff members** dedicate their working hours within their respective buildings, the clock sound offers an opportunity to create a shared experience during walks and lunch breaks. **Facility Management** is responsible for daily maintenance of the sound, ensuring the seamless integration of the clock sound into the campus ambience.

4.1 Method

Six generative sessions with a team of three members were organised, thus for a total number of eighteen participants, all MSc or former design students at Delft University of Technology with no previous experience in sound design (M age = 29.7 years, SD = 9.5). Three groups served as Control, whereas the other three groups played one round of Soundstorm before the actual generative session. Participants were seated at a table, and engaged in a 5-minute brainstorming session, after having read the problem statement presented in Table 1. The problem statement needs to be easy to understand, relatable to the participants, and relatively open-ended to accommodate all aspects of the experience of listening in ideas generation.

4.1.1 Data analysis. The generative sessions were recorded and transcribed, including the speaker and the timestamps. We used protocol analysis to gain quantitative data and questionnaires to gain insights into idea exposure and production blocking during sound-driven brainstorming. The transcriptions were segmented according to a two-step process, that is based on speaker turns first, and based on information chunks combined with common sense after [50]). For the purpose of our study, we devised a coding scheme arranged into four main categories, that is **Analysis**, **Feedback**, **Empty**, and **Ideas**, this last further split into four subcategories (**Generate**, **Combine**, **Transform**, **Old**), as defined in Table 2.

The total count of utterances, and a count of utterances per category can be used to infer the occurrence of idea exposure and production blocking. When looking at idea exposure, this effect not only improves the quantity of ideas, but also the iteration of ideas into each other. Therefore, when looking at the composition of the idea types, if idea exposure is higher, we expect to find more codes of Combine and Transform type, compared to Generative and Old ideas. Similarly, an increase in Analysis may be indicative

**Table 2: The scheme devised to categorise the participants' utterances**

Analysis:	utterances aimed at extracting more information chunks.
Feedback:	utterances that provide a judgement on a previous utterance.
Empty:	utterances that have no relation to the problem statement at all.
Generate idea:	utterances that contain new information chunks.
Combine idea:	utterances that combine already existing information chunks.
Transform idea:	utterances that change a previously existing information chunk.
Old idea:	utterances that contain already established chunks, with no new additions or transformations

that more attention is paid to idea expression. Looking at interruptions between participants can be used to infer the occurrence of production blocking. In this respect, an increase in the number of interruptions can be a sign of a higher confidence in ideas expression. If Soundstorm positively influences the idea exposure, then this difference should be reflected in the results.

5 RESULTS AND DISCUSSION

We offer the results of our pilot evaluation which was intended to gain insights on the protocol analysis approach, as well as on the value of Soundstorm as a possible sensitisation intervention tailored to generative sound-driven design. Figure 3 provides a general
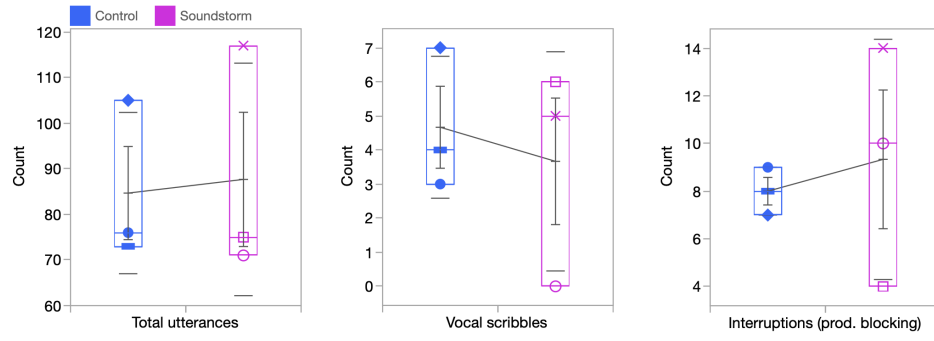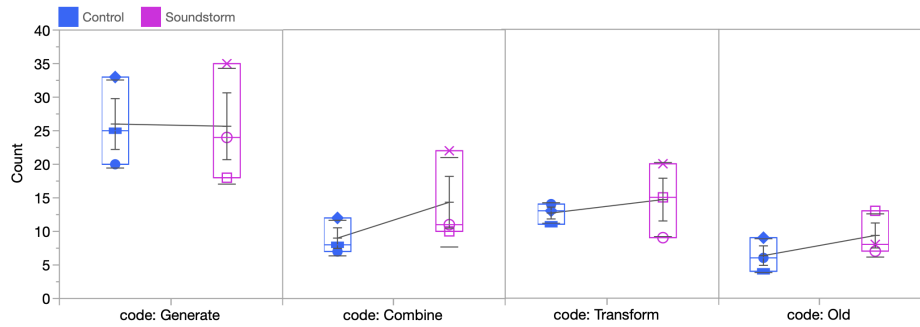
Figure 3: Counts of total utterances, non-verbal expressions, and interruptions occurring during the three generative sessions in both Control and Soundstorm conditions. Symbols represents groups.
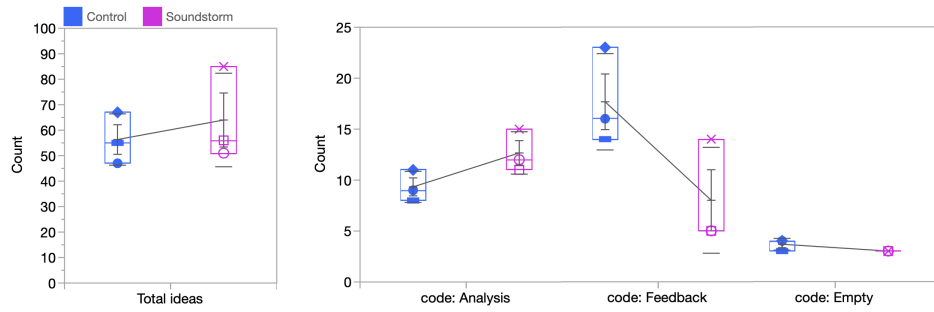
Figure 4: Counts of utterances per Ideas, Analysis, Feedback, and Empty. Soundstorm seems to have an ice-breaker effect in generative brainstorming sessions.

Figure 5: Counts of utterances per Idea types, that is Generate, Combine, Transform and Old.

overview of the count of total utterances, non-verbal vocalisations, and interruptions in the Control (blue) and Soundstorm (pink) group conditions respectively. From the visual inspection of the boxplots, we can observe that the mean counts are essentially comparable. In particular, non-verbal utterances seem to be an underused means of expression in both conditions. In this respect, Soundstorm does not seem to have an effect in the use of vocalisations to express ideas during a generative session.

The mean count of interruptions is also similar, although with a higher standard deviation in the Soundstorm group. An increase in interruptions may indicate a higher confidence in ideas expression,

therefore pointing at a reduction of production blocking. However, this possible observable effect is mitigated by the turn-taking nature of Soundstorm.

Figure 4 shows the composition of utterances according to the four main codes, that is Ideas, Analysis, Feedback, and Empty. Here, the figures are more interesting although the small amount of data does not allow to formulate any conclusion. The mean count of total ideas is slightly higher in the Soundstorm condition, although not significant (two-sample t-test, $t(3.1)= 0.63$, $p= 0.56$). Also, we can observe an increase in Analysis utterances and a decrease of Feedback utterances in the Soundstorm condition, which taken

together could indicate an effect of Soundstorm in facilitating a group cohesion focused on generating (feedback) and expressing (analysis) ideas. The decrease in Feedback utterances can also be a sign of a more effective brainstorming running. In this respect, Soundstorm seems to facilitate the generative session, by acting as an ice-breaker.

Finally, Figure 5 shows the composition of the total ideas according the four subcategories, Generate, Combine, Transform, and Old ideas. When looking at idea exposure, this effect does not refer only to the quantity of ideas, but also to their iterations into each other. In this respect, the slight increase of Combine and Transform types of ideas seems to support the influence of Soundstorm on idea composition. This is particularly noticeable in the codes count of the Soundstorm group identified with the star. Similarly, the increase of Old type of ideas may point to a more focused attention to idea expression and iteration, in line with the occurrence of Analysis utterances in Figure 4. To conclude, there are no clear indications on the effectiveness of Soundstorm in improving idea exposure, at least in quantitative terms.

On the contrary, the ice-breaker effect of Soundstorm is reflected in an increased iteration and more focused attitude of the Soundstorm group, although within the prevalent verbal means of expression. Comments by participants and observations stressed the fun, warm-up, and social cohesion values of Soundstorm, in particular: 1) forcing turns by removing passing fosters collaboration where participants begin to support each other to a certain extent; 2) although the game goal is to get the highest score possible, the actual score ends up to be irrelevant since there is not a real competition; 3) product cards are what make the game fun to play, especially when the combination with the sound cards create silly and weird prompts; 4) some product - sound cards combinations make the play more difficult, but this is a reasonable challenge.

Finally, we acknowledge several reasons that may have influenced the outcome of this study, and that we are considering in follow-up attempts: 1) the sample of participants is not wide enough to derive proper analyses and statistics; 2) the study setup should accommodate the reading of the problem statement in no more than one or two minutes, in order to avoid a possible negating effect on playing Soundstorm; 3) the brainstorming sessions were constrained to 5 minutes, where a longer duration may have been more appropriate to observe the presence of an effect on group ideation; 4) the coding system is still in a quite convoluted stage and should be opened up to more nuanced characterisations beyond the utterances count.

However, our pilot study was also an attempt to find a proper evaluation protocol for Soundstorm in particular, and for other sensitisation interventions to sonic expression, in general. While we were not able to measure the game's effectiveness, the protocol itself shows a good potential in providing an understanding of the dynamics at play in generative sound-driven design.

6 CONCLUSION

We have presented Soundstorm, a card-based collaborative board-game to sensitise group-work in sound-driven generative design sessions. Soundstorm was designed to facilitate the expression and practice of sonic ideas. Although no clear indications on the

effectiveness of Soundstorm can be drawn, yet the study confirms the ice-breaker value of the game.

To improve sound-driven ideation, it is vital that participants practice expressing sonic ideas, and that some initial social cohesion is formed. Kick-starting creativity just before the generative session starts is a good bonus, but only if the session is no longer than a few minutes. Soundstorm is intended to combine these three activities, namely practising sonic ideas, building social cohesion, and kick-starting creativity, into one with a focus on low entry barriers, by being fun and easy to play. Even though this preliminary study does not provide a substantial evidence, it highlights the importance and need of putting effort and attention into preparing participants for a productive generative session.

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