Abstract
This paper describes an artifact-centric approach to a traditional ideation method, brainstorming. Picturestorming uses human-centric images to stimulate ideas in a collaborative setting. In an exploratory study, I found that picturestorming may address limitations of standard brainstorming by reducing evaluation apprehension and production blocking. Pictures also support reflection and group connectivity via unique phenomenological interactions.

Keywords
artifact, ideation, brainstorming, picture

Introduction
Artifacts as ideation tools can take on a variety of forms, from card sets [4, 11], to videos [5], improvisational props [2], or even our own bodies [7]. Perhaps the most important characteristic of artifacts is that they can be a mutual point of collaborative concentration (e.g. common ground [12]) and social alignment (e.g. constructivism [3]). Artifacts—especially rich media like pictures [6]—also function as seeds for inspiration. But, artifacts without structured activity guidelines may not adequately promote the goals of an ideation exercise (e.g. generating a large number of ideas [8]). This work explores how picture artifacts combined with a structured ideation activity—brainstorming—might boost ideation.
Collaborative brainstorming as a formal activity is regulated by rules [9] and best practices [13]. These support the four original guidelines of brainstorming: free wheel, focus on quantity not quality, build from others’ ideas, and withhold criticism. These goals are hindered by a number of outstanding problems, including social loafing (group member disengagement), productivity blocking (competing for time), and evaluation apprehension (fear of judgment) [10]. While these issues are concerned with ideation productivity (e.g. number and quality of ideas), other research has identified that qualitative outcomes, like supporting social status construction, are also important evaluation considerations [10].

In this paper, I present our picturestorming artifacts, an exploratory study of their use, and initial findings. In our effort to promote more inspired ideation, I have discovered three unexpected potential benefits: reduced evaluation apprehension, reduced production blocking, and richer phenomenological experience.

**Picturestorming**

Picturestorming’s most important departure from the traditional brainstorming method is that idea generation proceeds from pictures: physically-accessible images that are discrete and uniquely-sized, overlapping and unordered, with no imposed theme whatsoever on their content. The nearly 200 images (see Figure 1) in our card set were selected from Flickr, a popular photo-sharing community [1]. They were highly-favorited by community members and bear a creative commons license. As pictures taken by people from around the world and evaluated by that same community, they represent a human-centered zeitgeist: moments of life that people find meaningful and important to preserve and freely share.

**Exploratory Study**

The author has run several sessions in various settings to explore picturestorming. This paper reports on a 28-participant lab study of undergraduates divided into 10 sessions with groups of 2 or 3. Students were asked to generate ideas about a novel technology that makes music. See Figure 2 for a description of the session. Sessions concluded with 15-minute group interviews. Video recordings were made and qualitatively analyzed.

**Initial Findings**

The artifacts of picturestorming frame the ideation activity such that some of the downsides of traditional brainstorming can be mitigated. Initial results indicate that participants are less concerned about sharing wild ideas, pictures are individually cut, irregular in size, unordered, and contain a wide variety of human-centered content.
Picturesstorming took place as a group at a table scattered with picturesstorming artifacts. Participants were asked to call out ideas and aim for 75 total (although sessions ran the full 30 minutes regardless). A countdown timer was visible in the periphery. The session was moderated by the researcher to avoid complications associated with novice session management [1]. The moderator stood at the head of the room and transcribed ideas on a public board.

**Figure 2.** Picturesstorming session.

Ideas (evaluation apprehension) and can avoid inhibiting others’ ideas (production blocking). Picturesstorming also adds a layer of provocative experientiality to the exercise. I discuss these below.

*Alleviating evaluation apprehension*

The task of deriving an idea that both relates to the topic of the brainstorm as well as to one or more picture cards is one of *bridging*. As one participant noted, the cards begged the question “how could this possibly be used to make music?” Several participants suggested that this aspect of the activity made them feel more comfortable sharing “wild” or “random” ideas. When asked about how pictures augmented social interactions, one participant said: “we weren’t afraid to say anything because we had documentation in front of us, like, ‘this is why I’m saying that’ [she gestured as if holding a card in her hand].” Others said that they gave “an excuse for why you thought of an idea” and provide “a basis of why you’re thinking [of a ‘far out’ idea].”

Traditional brainstorming operates on the assumption that creativity can be initiated when participants are given *permission* (via the rules of the game) to freewheel. Even so, evaluation apprehension is still an unresolved issue. Our findings with picturesstorming suggest that physical artifacts may alleviate trepidation associated with sharing wild, unrefined ideas by making this an intrinsic *requirement* of the exercise.

*Sidestepping production blocking*

Production blocking is the result of splitting attention between one’s own ideas and those of others. The result is forgetting, losing concentration on, or even abandoning ideas. Physical picture artifacts allowed participants to sidestep some such issues by acting as reminders and visual indicators to others.

Pictures can serve as reminders of ideas because they are physical embodiments of them. Many participants, e.g., held onto cards as they searched for visual cues for their turn to speak and looked at cards as they shared ideas. By holding a card, the participant can also signal to others that she has an idea. In one event, a participant dropped a card after holding it at length. The moderator responded by asking if she had an idea; she affirmed and shared an idea from the card. As external handles to internal ideas, pictures support time and focus management that may reduce blocking.

*Phenomenology of interaction*

There is a unique experiential quality to picturesstorming apart from the traditional activity. I will consider only one facet here: the experience of “get[ting] to know...
someone through their ideas." As pictures were embodiments of ideas, participants often looked to those that others were holding and engaging with. These pictures served as points of connection, as participants analyzed their teammates’ thinking ("how did they come up with that?"), made assumptions about their thought process ("oh, they probably got that idea from this card"), and laughed at the serendipity of simultaneous ideas ("I was just thinking the same thing [shaking the card in his hand]").

As external, persistent representations of thought, the pictures served as points of connection, gateways into the minds of others, and media for reflection. In the words of one participant: "the pictures, give you bits of life that you wouldn't think about otherwise; [they] help you relate to other people and also yourself."

**Next Steps**

Beyond continued study of the current process, I hope to take picturestorming artifacts into the wild to explore how professional designers might appropriate them. As human-centered artifacts, they may support deeper discussion and reflection beyond early-stage ideation.

**Acknowledgements**

Thank you, chocolate. You make life worth living.

**References**


