Pixsmix: Visual Expression through Ambiguous Design

ABSTRACT

Strategies for meeting people online are often based on appearance or demographics, criteria that do not guarantee quality connections or long-lasting relationships. Drawing from prior work in ambiguity and affective interaction, Pixsmix is a conceptual design to facilitate human connection through visual expression and interpretation. Participants create social artifacts—mosaics formed from a dozen public images—that motivate others to co-create meaning by guessing information about its originator and writing new narratives based on the selected images. To explore the validity and dynamics of this process of meaning making, we gathered feedback using a paper prototype and a task-oriented focus group. The outcomes support the notion of ambiguous design as an engaging creative activity and, through sharing of new social artifacts, as rewarding reflective experience.

Author Keywords

Ambiguous design, visual expression, connection, images, focus group, paper prototype.

ACM Classification Keywords

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

INTRODUCTION

The origin of this design project stems from frustration, particularly among women, with the quality and effectiveness of online matchmaking sites. The gender distribution is often weighted toward men, and the criteria used to generate matches may not fit with feminine values for relationships. To address this dissonance, we brainstormed characteristics people find attractive that do not involve precise appearance or demographics.

Physiological connections exist between sensual stimulus and emotion [3,8]. It doesn't take long for humans to make judgments about what we see. Our goal was to direct people to examine visual evidence of what is inside rather than external. Expression through visual imagery became our focus, and a rich design space awaited us.

Our core design assumptions are that people will react positively to the creation of these visual works—*it has to be fun to do*—and also that they will be willing to interpret the work of others. The Pixsmix concept calls for individuals to aggregate around new social artifacts, assembled from a dozen pictures selected from a library of 36 random public images. Other people would then respond to those ambiguous artifacts by annotating them with narrative and any perceived understanding of its creator.

As a multi-user interaction, dependent on people to co-create the meaning of the artifacts, traditional testing of individuals using prototypes would provide only a limited view of the potential community dynamics. To address this shortcoming, we decided to facilitate a task-driven focus group on expression and connection. This paper explains the context for ambiguous interaction and the results of the focus group that supports our design concept.

Ambiguous Design

The main interaction in Pixsmix is the manipulation, selection, and arrangement of random photos into a grid. These photos are drawn from an ample supply of interesting pictures available through the Flickr API[1]. Except in rare cases, none of the photos shown to a Pixsmix member will originate from that person's own gallery. These images are taken from other people's lives and based on the photographer's experiences and interests.

Brought into our interaction as a creative material, people construct social artifacts based on the sense they make of the strange images they see. In doing so, they actively construct a meaningful human experience around the technology [11], and that artifact in turn will be assigned different meaning by others who see it. This is the key characteristic of *ambiguous design*.

As introduced to HCI in 2003 by Gaver et al, ambiguity falls into three broad classes: *information* (in the artifact),

[1] http://www.flickr.com/services/api

context (surrounding the artifact), and *relationship* (in the participant's experiences) [5]. The authors suggest several actions the designer might consider when enhancing the ambiguous design of an experience. These suggestions include:

- *Over-interpret data* to encourage speculation. (information)
- *Cast doubt on sources* to provoke independent assessment. (information)
- *Implicate incompatible contexts* to disrupt preconceptions. (context)
- *Offer unaccustomed roles* to encourage imagination. (relationship)

With the help of a creative author arranging the new composition and the willing audience interpreting these visuals, Pixsmix embeds the above suggestions in its user experience.

Ambiguity in the Wild

There are several examples of systems implemented as ambiguous design, most notably the Home Health Horoscope. HHH is a sensor-based project that collects information about activity in a home and turns that data into over-interpreted statements, modeled after horoscopes [6].

One perhaps intractable problem designing for wellbeing is to have computers collect sufficient data to be able to interpret meaning with precision. Rather than use sensor data to report and process *precise* measurements, with HHH the responsibility for interpretation of that data shifts to the occupants of the home. The horoscope becomes a social artifact that prompts discussion, often about how that day's statement is wrong.

AuralScapes—a project to bring arrhythmic sounds and overhead images into an enclosed internal room—attempts to change the ambiance of the space. The information presented is *ludic*, or playful—it is purposely blurred and incoherent until the observer gives it aesthetic meaning. With AuralScapes, the same hum of nearby machinery that was initially annoying to occupants of the interior space will, over time, became familiar and even comfortable [10]. Interpretation evolves with experience.

Ambiguity can also lead to *appropriation of use*. In a field test conducted with networked cameras, participants attempted to generate social artifacts from images within context of their own lives. Through the device, they were encouraged to share these artifacts between family and friends. In practice, the device was used as a broadcast tool for storytelling (i.e. a "murder scene" created by two boys), to express spirituality and affection, to strengthen group bonds, and in supporting conversation [9].

For some, ambiguity can produce adverse reactions. Pangmangi is a flat-panel display installed on office doors to create awareness of the occupant's availability. During testing, the installation generated frustrations with the lack of precision (example: "When you don't see her does that mean she's gone?") and incorrectness of interpretation [7]. Sometimes, this reaction is *provoked*. Digital deviance addresses the needs of more disturbing parts of humanity through application design—as with Loki, a chat bot designed to create gossip in an office environment [4]. Sinister prompts can engender positive outcomes: the technology assumes a negative role, prompting humans in the group to exhibit noble behavior.

GAUGING ENGAGEMENT

For Pixsmix, all four of these qualities of ambiguous systems—imprecision, playfulness, re-appropriation, and provocation—are potentially integral to the user experience we want to create. Prior to implementing a full system, however, we explored our concepts and assumptions through a task-driven focus group.

Methodology

Initially, a paper prototype comprised of 36 pictures cut from magazines was created to simulate the kinds of images we might expect to provide through Flickr. Three people were recruited through local online social networks to participate in a small user study. The goals for this inquiry were to: (1) evaluate the perceived individual value of the proposed interactions; (2) observe the process of sorting through images to select a dozen for the composition; and, (3) to better understand the strengths and weaknesses of the suggested GUI navigation. Outcomes of the paper prototype study informed our approach to the larger focus group.

Ten local people were recruited (with promise of a free lunch) to participate in the focus group and discuss topics related to expression and connection. At the start of the session, all participants completed a short survey about demographics and use of technology. They then undertook a number of tasks related to ambiguous design and the visual expression interaction planned for Pixsmix.

Packets containing 36 small pictures were distributed to all of the participants. Every person selected the 12 pictures they liked the best and arranged them to fill a 4x3 paper grid. Three rounds of packets were distributed:

- *Interesting*—list of Flickr's most interesting pictures
- *Contacts*—interesting pictures from friends
- *Creative Commons*—photos with a public-use license

As each composition was completed, a photo was taken. A total of 30 such images were captured for later analysis.

The final task involved making sense of an existing composition, previously created from the third packet of pictures. This mosaic of photos was displayed on a screen for everyone to see, and each participant was asked to guess some basic demographics of its creator and compose a short story inspired by these pictures. Group discussion of these activities followed.

The participants in the focus group were split evenly along gender lines (5 women, 5 men) with ages ranging from 24 to 52 years old. Only one participant was not an active member of any online social or media community of interest—7 Twitter, 7 Facebook, 5 YouTube, and 4 Flickr—and just two self-reported spending fewer than 6 hours a day online.

Most participants considered themselves "artistic" (7 of 10). The three who did not were all women and at least 34 years old. They also had the least amount of active exposure to online social networks (2 only used Facebook, and 1 had no active accounts) and the least daily time spent online.

Composition

The results from the initial prototyping sessions created expectations for the focus group. The three subjects each found the concept enjoyable and indicated they were intrigued about seeing it as a real site. They all explored the images thoroughly before selecting their first picture to place in the grid, spreading them out to see them all at once (everyone used space off of the paper "screen"). Even with just 36 pictures, few images overlapped between the three mosaics; only one of the 25 images used appeared in all three compositions. These findings became areas of interest in the group session.

Process of selection

As with the prototype tests, participants in the focus group initially examined all of the images in a packet before making any decisions. In many cases, this involved first spreading out all of the pictures on the table, off of the paper containing the grid (in one case, the participant went through the entire stack one at a time). A common strategy involved separating candidate from non-candidate images before selecting and arranging the twelve finalists.

Some distinctions emerged between how the three packets of photos were used. The "Contacts" set contained photos from the facilitator's Flickr network—including some talented photographers, clay artists, and President Barack Obama. Limiting the number of photo contributors had the effect of narrowing the diversity of subject matter: the set contained 7 images of clay book boxes, 7 of the President, 7 Indian people, and 4 divers. As a result, participants tended to form thematic piles as part of their sorting process.

Everyone had to resolve the constraint of the 4x3 grid offered as the composition space. All twelve spaces in the grid were landscape orientation, but a number of the pictures were portraits. Compositions from the first two sets showed modest use of portrait images (15 and 9 portraits, respectively, with 6 and 2 turned sideways), but the third set saw 30 portrait images selected with 13 turned sideways to fit. One person experimented with the grid itself, turning it into a 3x4 orientation.

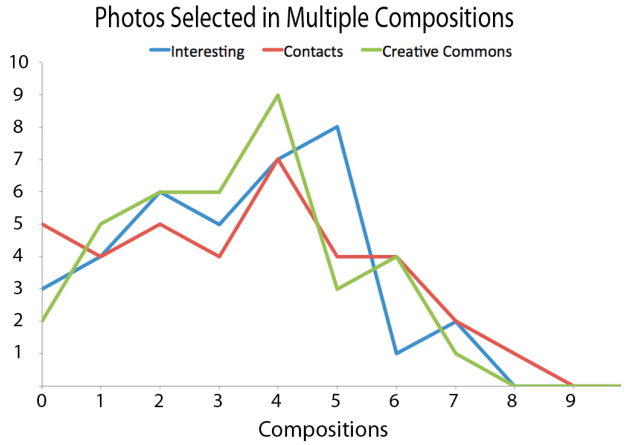

Figure 1. Distribution of images used in compositions

Distribution of images

The 36 images in each set showed an encouraging distribution across the 10 compositions created for each packet (Figure 1). In all three exercises, the majority of images appeared in no more than 4 arrangements. Only one image—from the less diverse "Contacts" packet—appeared is as many as 8 of 10 compositions.

Only ten images across all three sets (108 total images) failed to be used by at least one of the participants. Complicated or fine-detailed photos were used less frequently than images with a simple subject. Awareness of a prior meaning was also influential in decision-making. In the "Contacts" packet, five images of Barack Obama were not used, and of the three that were only one appeared in more than one composition. The most popular images were often distinctive and unattached to well-defined meaning (*"I gravitate toward pictures with neutral emotion."*).

Interpretation

When shown the completed composition—assembled prior to the focus group, from the now familiar "Creative Commons" packet—the participants were forced to interpret what they saw. This took the form of guessing characteristics of the artifact's creator and writing a narrative inspired the those particular pictures.

Guess the creator

People projected their own selves onto the artist. Participants described the creator's mood in contradictory ways, including artistic, quiet, ambivalent, engaged, out-of-sorts, playful, whimsical, and reflective. Only one person went against his own gender when guessing the gender of the composition's creator, and everyone aimed toward a median of 30 years old—younger participants guessed the creator was older, and older participants guessed younger. In reality, the composition was created by a 5-year-old boy, who had grouped his picture with his favorite dark pictures to the left and bright pictures to the right.

As with Loki (one person raised concerns with that system about not realizing his information was being disseminated in the form of gossip [4]), revelation was not entirely welcome. Upon discovering who composed this work, one participant appeared sad among the many smiles (*"I feel really dumb."*). Many indicated they now saw the composition in a different light (*"Finding out a 5-year-old did this explains a lot about the choices."*).

Inspirational stories

The stories authored by participants about the composition varied in length (149-592 non-space characters). In all, 399 unique words and 3513 non-space characters were generated from this exercise. There did appear to be a gender difference in how the stories were written, although age, online use, or sense of artistic ability may be equally culpable. The male authors used 58 different words, on average, and almost 11 sentences. Women used just 43 different words and 10 sentences. The readability index was slightly higher for men (7.16 to 6.94).

Some basic text analysis was applied to these stories, using Textalyzer (http://textalyser.net). Ignoring numbers and words shorter than 4 characters, the top words included:

- *Descriptors*: dark, full, long, light, left
- *Subjects*: life, places, fruit, John, night, Johnana, photos, shadow, mind, images, color
- *Actions*: like, feels

Several people stated they only wrote something because they were instructed to do so and likely would not do so of their own volition, even if listening to stories was fun.

Connection

At the start of the focus group, no introductions were offered to the ten participants. In the absence of formality, the people in the room were uncomfortable. However, one person noted that it was easier to focus on the initial tasks (*"Doing the exercise without knowing everyone made it easier to focus. With all my friends around we'd be talking."*). The presence of the facilitator proved an obstacle to communication as well (*"When you left we started talking."*). That shared experience—both the uncomfortable social situation and the required tasks—ultimately allowed the participants to engage both with the artifacts and each other (*"I would not have been interested [in the pictures] if I hadn't done this first."*).

Common tasks and shared experiences proved a recurring theme as participants described how each met his or her "best friend." Six people indicated the ultimate attraction was because the best friend played a complementary role, rather than birds-of-a-feather. Everyone had some common context in which the bonds grew.

SUMMARY

Ambiguity is not a fixed target. Over time, interpretations can become convention, lessening the ambiguity and thus need to interpret [2]. Different meanings arise out of different contexts, and therefore, ambiguity must be designed as an interpretive *space* [1], rather than a discrete object that remains eternally ambiguous. For that reason, Pixsmix must continually adapt certain elements (images, responses, creative controls) to continually recreate the experiences encountered by our focus group.

The shared cyclical experience of artifact creation and interpretation, as witnessed in the focus group, lends credence to the inspiration for the Pixsmix: to connect people in a new and meaningful way.

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