# Broadcasting Information via Display Names in Instant Messaging

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## ABSTRACT
Many instant messenger (IM) clients let a person specify the identifying name that appears in another person's contact list. We have noticed that many people add extra information to this name as a way to broadcast information to their contacts. Twelve IM contact lists comprising 444 individuals were monitored over three weeks to observe how these individuals used and altered their display names. Almost half of them changed their display names at varying frequencies, where the new information fell into seventeen different categories of communication supplied to others. Three themes encompass these categories: *Identification* ("who am I"?), *Information About Self* ("this is what is going on with me") and *Broadcast Message* ("I am directing information to the community"). The design implication is that systems supporting person to person casual interaction, such as IM, should explicitly include facilities that allow people to broadcast these types of information to their community of contacts.

## Categories and Subject Descriptors
K.4.3 [Computers and Society]: Organizational Impacts - *Computer-supported collaborative work.*

## General Terms
Design, Experimentation, Human Factors.

## Keywords
Instant messenger, display name, communication, awareness.

## 1. INTRODUCTION
Millions of people use instant messenger (IM) clients daily to communicate with friends, relatives, co-workers and even online dating contacts. With this explosion of use, researchers have taken to studying instant messaging and its impact. Much of the research regarding IM has been focused on its primary uses: maintaining awareness of a contact's presence and availability, how people (usually dyads) converse via text chat, and how they exploit other features such as file sharing and receipt of notifications. For example, studies of IM use in the workplace expose how it supports collaboration, communication and project activities [3, 10, 13], as well as its negative effects [15] such as disruption [4]. In more social contexts, researchers found a positive relationship between the amount of IM use and verbal, affective and social intimacy [9]. IM also proves important in the life of teens, where it helps support the maintenance of their social relationships [8].

Other computer-mediated communication tools, such as MUDs (Multi-User Domains or Multi-User Dungeons), IRC (Internet Relay Chat), and broadcast messaging tools also allow spontaneous real-time (or synchronous) communication with other users. However, there are significant differences between them. IM is predominately used between people who are known to each other outside of cyberspace, e.g., friends and associates. IM conversations are also private, and tend to be between pairs of people. They are also person centered and not group centered: while a contact list may collect one's 'buddies', these lists are not shared across contacts. In contrast, MUDs and IRC are public channels, where any conversation is heard by all people currently in the MUD or IRC. Most tend to be used by 'strangers', i.e., those who are unknown to each other in real space, and usually involve more than two individuals. Indeed, the norm is for participants to protect their anonymity by displaying a pseudonym rather than their real names. Any personal messages that are posted are usually in relation to their virtual identity. However, a few experimental MUD-like systems do focus on teams, where they provide its members with rich awareness information of one another and more power in their collaboration tools, e.g., Sideshow [2], Notification Collage [7], or Community Bar [12]. Broadcast messaging tools [11] sit in the middle, where real-time messages usually comprising notifications and announcements (not conversations) are sent to large groups of people who are somehow associated with one another, e.g., Tickertape [6].

The big 'win' of IM is that it provides one's ad hoc set of contacts with awareness of one's online state, which in turns serves as an estimate of one's availability for conversation. While not completely accurate[13], even this minimal information suffices to create opportunities for lightweight text-based conversations and to reduce the equivalent of 'telephone tag'. While many research systems go far beyond IM in the rich awareness information they give to others [e.g., 2, 7, 12, 16], questions remain about privacy implications of distributing this information.

IM contacts are identified by the system through e-mail addresses. While unique, these email addresses may be cryptic

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**Figure 1: MSN Messenger; modified display names are visible**

to a human viewer e.g., a person may not be able to infer that 12gorwan@ yahoo.com is really Gregor McEwan. Consequently, the designers of most IM clients include a feature that lets a person create and/or change their display name at any time; this name is shown to others instead of the email address. For example, in MSN Messenger (Figure 1) a person can raise the 'Personal Settings…' dialog by selecting the drop-down menu attached to their name (i.e., 'Stephanie' in the figure), and edit the 'Display name' text field – which we also call the *display field* – within it. All contacts immediately see this new name.

Because we are heavy IM users, we noticed that many of our contacts change their display field to do more than simply identify or label themselves. Figure 1 illustrates this, where we see that various people have used this feature to publicly broadcast what they are doing (e.g., 'anitsirK – Marking') or an event in their life (e.g., 'Employed'), or a personal state of mind (e.g., 'Chasing Insanity'). Other examples we saw include using the display field as a way to publicize personal status, specify location, post comments, ask questions, and even post popular culture references. These obviously augment IM's preset availability messages (i.e. away, busy, be right back) in far richer ways than the system was explicitly designed to support.

We believed that people's appropriation of the IM display name feature into a public broadcast facility is a phenomenon worth exploring. Why was this space being appropriated for messages broadcast to an entire contact list? What were users trying to communicate to others and how is this information different than that in a normal IM conversation? How often do these messages or alternate communications occur? To answer these and other questions, we conducted a three week study, where we monitored changes in each person's display field within contact lists held by various users of MSN Messenger. We tracked how often contacts changed their display name, and what these changes were. We also categorized these changes into communication purposes.

After briefly summarizing some related work, we describe the methodology used to acquire display name usage data. This is followed by our results, a discussion of the findings, implications of the work, and recommendations for future work.

## 2. RELATED WORK

There are a variety of articles describing how people identify themselves on the Internet, usually in MUDs and IRC. Yet most of these stress how identity is formed through pseudo-anonymity [1,17], i.e., where a person creates a virtual identity to project a different persona of who they are while protecting their real identity. People's choices of names and/or avatars are usually one part of identity creation. This work is not particularly applicable to IM, as people on a contact list are typically known to one another.

Grinter & Palen's [8] study of teen use of IM is far more relevant, and partially reflects our own interests. While their work broadly considers IM as an emerging feature of teen life, they do mention that teens found the preset availability messages to be too impersonal. To combat feelings of exclusion or to avoid being rude, teens would personalize the display name area to include a message which explains their unavailability, changes in their local environment (i.e., 'Going quiet because Mom just arrived'), and for justifying their lack of presence on the system (i.e., 'Out for dinner').

The use of IM names to broadcast messages is an everyday world phenomenon, and has been anecdotally noticed by non-scientists. For example, one reporter noted in a newspaper article that changes to her display name are her main form of IM communication rather than actual chat conversations [14].

Social scientists talk more generally about computer mediated communications and how they can be used to build communities. Etzioni and Etzioni [5] argue that in order to form and sustain bonds, a community of connected individuals needs what they call "interactive broadcasting". This is composed of two major elements:

- the ability to broadcast messages to many people within the community simultaneously, and
- the ability for those addressed by the message to provide feedback, not just to the message originator, but to other message recipients as well.

In this context, a broadcast message can be considered a request for interaction from some (or all) members of a group [11]. A variety of designers have implemented this broadcast capability into their systems. For example, IRC, Notification Collage [7], Community Bar [12] and Tickertape [6] are all tools that implement interactive broadcasting. A message (which may include multimedia information) can be posted and broadcast to the group, and it is possible for everyone to view the information without directly contributing to the conversation. Those who want to respond can do so, in full view of all users. All these systems allow for communal feedback, i.e., where everyone sees the response. Unlike IM, however, these systems include a strong notion of a common group by providing a public space for interaction.

In summary, there are discussions of how broadcasting information contributes to community building, and there are systems that are based on public dissemination of information within a group. However, excepting a few brief mentions of this

phenomenon [8,14], there has been no real analysis of how people have appropriated the display name feature of IM. Given the importance and widespread of IM, we believe this analysis is critical if we are to understand how we can improve IM systems.

# 3. METHODOLOGY

This study investigates how people use the display name feature in IM clients to broadcast information other than one's name. We do this by capturing changes in each person's display field as they appear in contact lists over time and over everyday use, by asking people to explain what these changes meant, and by counting, categorizing and analyzing these changes.

## 3.1 Research questions

We wanted to identify three main behavioural patterns within our captured data:

1. At what frequency do users change the information in their display field when using an IM client such as MSN Messenger?
2. What are the main communication categories that represent the information held by these display field changes?
3. What is the frequency distribution of these categories?

A fourth interesting but secondary question was:

4. Are changes to the display name related to the demographics of age or sex?

## 3.2 Participants

We had two classes of participants. Our primary participants were those who made their contact list available to us. Our secondary participants were those who comprised the people on the contact lists.

Twelve participants were recruited as primary participants, all graduate students or faculty at the University of Calgary. They ranged in age from 23 to 50, and were regular users of MSN Messenger. These participants provided access to their IM contact lists. They were also willing to annotate the collected data. While the number of contacts on each person's list varied somewhat, this variance was irrelevant to our study.

Our secondary participants were the 444 contacts found on the contact lists of the 12 primary participants. These contacts covered a broad range of demographics and social relationships, i.e., fellow students, workmates, friends, family members and other relatives. While the display names used by these 444 people were collected as data, they were not contacted directly.

## 3.3 Materials and Data Capture

Each participant (whether primary or secondary) used their own pre-existing and unaltered MSN Messenger client on their own computer (running Windows) for everyday purposes.

We wrote a logging program to collect all contact list data from each primary participant. It monitored every person's display field as it appeared in the contact list. The software worked by tapping into the programming API of MSN Messenger (regardless of its version) to monitor activities within it.

This logging program was given only to the 12 primary participants. No special software was needed by the 444 secondary participants, as their data was captured via the logging software on the primary participant's computer.

The 12 primary participants installed our software on whatever computers they wished. When installed, it worked in tandem with MSN Messenger to collect data on everyday IM usage in the field.

The program monitored whether the participant was logged in to MSN Messenger. If logged in, it recorded the initial set of display names and any display name changes of the secondary participants on the contact list. The initial set of display names were needed to notice if a change occurred since the primary participant's last login.

As part of our analysis, we used the standard features of Microsoft Excel 2003 to sort and consolidate the data files. Relevant data was then transferred to Minitab v.14 to tally distributions, calculate any statistics and create visual representations of the data. Further analysis of the categories of communication used in the display field was conducted using paper cut-outs and post-it notes to create an affinity diagram; this is detailed later.

## 3.4 Method

Once primary participants agreed to participate in the study, we gave them instructions on how to install the logging program on their computer. We did not have to be present for this, so people could install it on whatever computers they regularly used, be it at work or at home. The program then ran automatically; the only indication of its operation was a small red notebook icon appearing in the participant's system tray. This icon allowed a participant to abort the collection process if they wished, but none chose this option.

Data was collected for approximately three weeks, but did require the person to be logged onto MSN Messenger. If a primary participant was not logged on, no data about their contacts was recorded. This meant that some display field changes of secondary participants could have been missed.

## 3.5 Analysis

At the end of three weeks, the primary participants were instructed to open the data file with Excel, and indicate the sex and approximate age of each listed contact member in a pre-designated column. For each display name change, they were also asked to categorize the type of information the contact was trying to broadcast to others. We did not predefine any categories. Participants created their own category labels and categorized names into them however they wished. We chose this approach because we felt that participants would have a far better understanding of the true meaning of a person's display field changes than someone unfamiliar with the contact; we also felt that as recipients of this information, their interpretation was important. We also believed that they would generate a greater – and therefore richer – breadth of categories.

Once the categorizations were completed, the data files were transferred to the primary investigator. The investigator consolidated all of the data files into one master file, and removed any duplicate entries. These duplicate entries occurred for two reasons.

- More than one person had a particular contact on their list.
- Each time a participant logged in, their entire contact list was recorded in the data file. If a contact had not changed their name while the participant was offline, a duplicate entry was created.

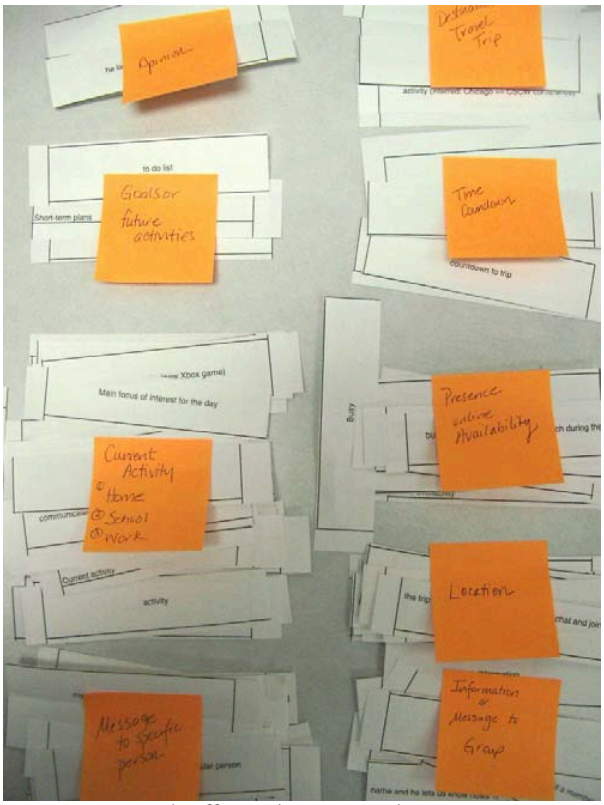


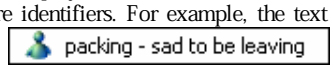

**Figure 2: Example affinity diagram used to group participant categorizations into master categories.**

When duplicate entries occurred, all but the earliest occurrence of the display name change was removed.

A category list was created for each primary participant based on his or her individual categorizations of display name changes. Because these category names could differ between participants, we needed to re-categorize these names into a master category list. To do this, all categories were printed on separate slips of paper for easy sorting. We then created an affinity diagram to resort these categories, where entries from all the lists were sorted into groups based on similarity. These groups then formed a master category (see Figure 2). A master category title was then chosen that best represented the theme for the grouping. After this master list was established, the entries in the consolidated file were then re-categorized based on these new divisions; this would allow us to create a distribution profile.

We should mention that many entries into the display field contained more than one textual element, each of which could be categorized differently. When this happened, we treated the display field as holding multiple entries. An example of this is shown here, where the contact's display field contains two elements; 'Johnboy' could be categorized as a Name Variation, while 'yonge&eglington' (a street junction in Toronto) is categorized as an indicator of Location. In this case, this display field entry would be split into two text fragments, where each fragment would be counted in the category that best fit. As we will see, these types of dual entry usually occurred because people tend to keep their names (or an identifying variation thereof) visible to others in order to identify themselves. Occasionally a display field would contain two elements where neither were identifiers. For example, the text shown here is categorized as two elements: 'packing' is an Activity, and 'sad to be leaving' is a Mood. Only rarely did display field entries contain more than two elements.




# 4. RESULTS

## 4.1 Display name change rates

Our first research question was:

> At what frequency do users change the information in their display field when using an IM client such as MSN Messenger?

Before answering this question, recall that the recording of display field changes of a secondary participant on a contact list only happened when the primary participant was logged on to MSN Messenger. If the primary participant was logged out, no display field changes to their contacts were recorded. While a single change would be noted by comparing the last recorded version of the contact's display field to the one recorded when the primary participant logs on, multiple changes during the logout period would be lost. This means we cannot calculate the exact display name change distribution across all contacts. Still, our numbers should be a good estimate of what happens. At the very least they represent a lower bound that somewhat underestimates how often display fields changes occur. The data certainly suffices to indicate the range of activities and individual differences across 444 people.

It was only during a active session that we could detect any name change by a contact (secondary participant), or view the change currently on display which may have occurred prior to logon. During a period where the

Figure 3 illustrates the distribution of contacts according to how often they changed the contents of the display field. Our results show that 58% of our 444 contacts (258 people) never changed the contents of the display field during the three week period. For the remaining 42% of contacts (186 people), we counted a

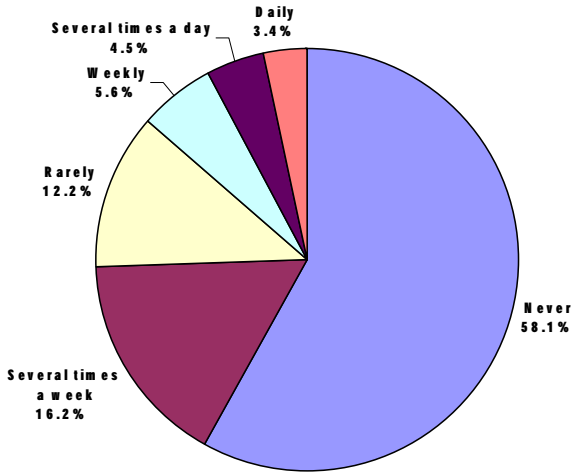



**Figure 3: Distribution of contacts according to how often they change the display field contents**

total of 1968 display name changes, or an average of 11 display name changes per person over the three week period, or up to 4 times a week.

However, this average is misleading, for we also found that people change their display names at different frequencies. We created six rate change categories. Based on a contact's data, we placed each contact into the category that best estimated that contact's change rate. Figure 3 displays this distribution of contacts among the six rate change categories. We see that the 42% of contacts who change their display name do so at different rates. About 8% (4.5% + 3.4%) of contacts change their names from once to several times a day. About 22% of them change their names less often, from once to several times a week (16.2% + 5.6%). The final 12% change it rarely, i.e., once or twice over the three week period.

The person who had the highest display field change rate is worth added discussion, as it suggests what happens with contacts who used this feature heavily. This person changed his display field early in the morning, and notified contacts when he arrived at school. Around 4pm the changes started again, continuing until approximately 11pm when he went to bed. His changes would incorporate details on what was occupying his time. Changes would state particulars: when he were studying, babysitting, or watching TV, and his emotional reactions to these events. If he found something entertaining or interesting on TV, he would post quotes. If he was bored, he would put out a request for someone/anyone to call. In essence, this person used his display field as a blog, where he recorded and disseminated information to his community. Even though we had no further knowledge of this person, a sense of who he was and what his life was garnered through all the changes that he made to his display name.

## 4.2 Communication categories

Our second research question was:

> What are the main communication categories that represent the information held by these display field changes?

After analyzing the categories created by our primary participants through the affinity diagramming process, we identified seventeen master categories. These are listed below in alphabetic order. A description of each category is given along with illustrative examples taken from our data. Many examples contain more than one textual element, usually an identifier, as we present them as they appeared in the display field. To protect confidentiality, name information has been changed.

**Activities** include things or activities that a person has done in the past, is currently involved in, or is about to participate in the future. It also includes countdowns to an upcoming event. Examples include:

- Amy - House hunting!
- Joe was drunk on a Tuesday...shameful.
- Braced: 60% done my portfolio!

**Adverts** include advertisements or promotions for items or events, and things that people have for sale.

- Easton Synergy Grip 100 Flex Iginla Blade Left (Brand spanking new): $225
- headachey -- Tim Stuart Tribute and Fundraiser November 6th @ 8PM -- ask for details

**Comments** are personal comments, expressions of an individual's opinion and general statements on how they view things in the world around them.

- Jan[et] - Airlines are Evil
- Bee - undocumented code should be illegal
- Nancy: you don't need English to live in Vancouver

**Default** contains only the default unaltered entries to the display field. After installation, the IM client displays a person's e-mail address in the field. These may or may not actually contain a person's name as part of the email address.

- johnsmith@ hotmail.com
- Jyn2l@ hotmail.com

**Directions** contain entries where a reader is being directed to a web site or link. Examples are:

- Bee-http://java.sun.com/features/1999/05/duke_gallery.html
- jessie {http://littlemisskool.blogspot.com}
- CHECK THIS====> http://www.blitzkreigentt.com/.... Constructed <====

**Fun** contains entries that contain puns, inside jokes, humorous statements, and items placed for the amusement of others.

- Melanie. me: "come see, its a lunar eclipse"; kate: "where?"
- what do you call a fish with no eyes: f sh
- Huffy - Home is where you hang your @
- Joe - ♪Like a Vermin, trapped for the very first time♪

**Handles** contains those display name entries that hold a person's handle. A handle is like a well known nickname: it is a a consistent title or name that people give themselves to represent their identity on the internet. As we will see later, IM handles are not used for the pseudo-anonymity purposesas found in IRC public forums.

- hunnybear
- Iceman
- spidermax

**Location** contains information about a person's current location or future destination. It can also contain travel information. Many times this location information is permanently attached to the display name when localized at a particular computer, as in "home" or "work". This label can indicate to others the type of communications that are appropriate.

- Mat Singh...going home in 10 days!
- In the dominican republic
- Dan James [Office]
- mike -> lab meeting

**Messages** contain information of significance directed at an individual on a person's contact list or to the group as a whole.

- darren~thanks nate for the halo hookup🙄
- SirMe - Happy Birthday, Angie!
- Melanie. Nick, ill be on the 3 30 or whatever bus at the college. <<school>>

**Mood** contains entries that give indications of a person's mood, feelings, health or state of being.

- i give up
- Adam feels rejected
- britney - disoriented haze
- Joe - as if shot in the head, yet still charging blindly forward.
- Bee - double espresso☕☕ whee!!!
- Maggs - Not Feeling Well.

**Name** contains entries of a person's given name. This category contains no nicknames, handles or variations on the name.
- Rebecca
- Fred Jones

**Notices** contains entries that give notice of a particular event, share news or display announcements.
- DBosch [ We're home owners! ]
- Tracey... down 24.2 lbs
- Jennifer - party is cancelled
- NaKuL - new msn login
- Gretchen -- Holy Cole's coming to vancouver!!

**Presence** contains items which provide more detailed information about a person's online presence or availability beyond the standard status indicators.
- Bee - really am busy, only msg me in emergency
- Melanie. >> off for family time<<
- mike - reading at my desk/disregard (Away) status
- Flickerin: be Back at 630ish

**Questions** contain rhetorical questions and questions that are posed to stimulate response. This category also contains questions that are requests for assistance, similar to those that appear in company broadcast messaging systems when a person is searching for an expert in a given area [6].
- Luke -- Anyone took CS322? I need some help with cilog!
- Joe - who keeps messing with my chair??
- Shri- Needin' a Physics Toolkit w/Dynamics + Collisions + Fields, any ideas?
- Melanie. Anyone have a working printer?

**Quotes** contains quotations taken from movies, tv, books, plays or lyrics from music. It also contains references to pop culture.
- Dusit - If you can dodge a wrench, you can dodge anything!
- b33qZ -- king jeremy the wicked... oh, rules his world...
- Andrea - so long and thanks for all the fish

**Unknown** contains all the entries in which the meaning of the text is too cryptic that it could not be categorized by either the primary participant or the investigator. It is assumed that once deciphered that each of these entries could be placed in one of the other sixteen categories.
- b33qZ [nts:perri]
- Andy ~ Ah é§'
- Black_Venom (In 432)Â Â Â Â Â Â Â Â Â Â Â Â Â Â Â Â Â Â Â Â
- Â»~-jd-~Â«--> SkRoNk <-- yeh social ppl

**Variations** contain entries where the identifier is a variation on the person's name. This can include an abbreviated version of the full name, a nickname in which the given name is still identifiable, or a variation in the way the letters of the name are printed or ordered.
- DiAnNe
- kev
- Maggs
- timbob
- Einahpets

## 4.3 Category Distribution Frequency

Our third research question was:

What is the frequency distribution of these categories?

First, the 1268 changes to display fields were analyzed to reveal a total of 3603 elements (recall that some display fields could have more than one information element in it). Second, each element was then located in a single communications category that best represented its meaning.

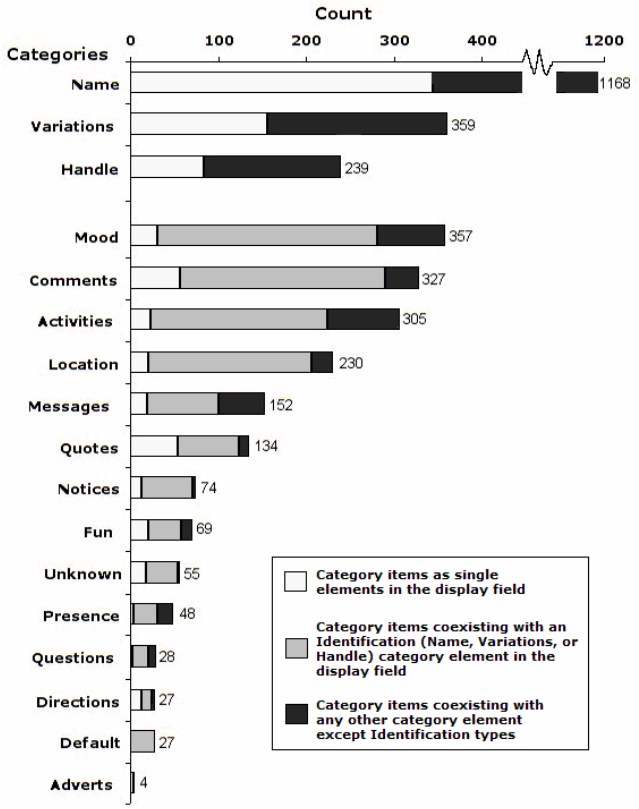



**Figure 4: Bar chart displaying category distribution**

Figure 4 shows these category counts in two sections. The top part plots the Name, Variations and Handle categories. We separated these 'Identification' categories from the other categories because the information they contain satisfy the original purpose of the display field i.e., to hold identifying information. The frequency distribution of the remaining 14 categories are then listed.

The bar representing the counts of the number of elements within each of these categories are further distinguished into three groups. The lightest section of each bar represents the group of category elements that were the only element contained by the display field. The medium coloured section shows the number of category elements whose text coexisted with another element found in one of the three 'Identification' categories in the display field. The darkest section of the bar groups category elements whose text coexisted in the display field with another element found in any category other than the three 'Identification' categories.

The figure shows that approximately 49%, or 1766/3603 of the categorized elements, were in one of the three 'Identification' categories, i.e., **Name** (32.4%), **Variations** (10%) or **Handle** (6.4%). This makes sense, for meaningful self-identification is the expected use of the IM display name feature. The darkly colored regions of their bars also reveal that identification

elements in total coexist with other pieces of information in the display field over 67% (1186/1766) of the time. For example, the **Name** was included with other elements 825/1168 (71%) of the time. Similarly, **Variations** and **Handles** was included 205/359 (43%) and 156/239 (65%) in conjunction with other elements. Note that there are no medium coloured regions in these bars. This is because elements within the **Name**, **Variations** and **Handle** categories never co-existed with each other. They only occurred in conjunction with elements in the other 14 category types.

The other 14 categories of communication identify information unrelated to identification. Collectively, these categories comprise the other 51% of the total number of elements (1837 of 3603 total). Within these 1837 elements, we see that the most frequent categories of communication used are **Mood** at 19.4% (357/1837), **Comments** at 17.8% (327/1837) **Activities** at 16.6% (305/1837), **Location** at 12.5% (230/1837), **Messages** at 8.3% (152/1837), followed by **Quotes, Notices** and **Fun.** The other categories occur less often, but still at a significant level. The modest size of the lightly coloured section of all these categories suggest that this information often appeared in tandem with other categories. Most of time, this was one of the **Name**, **Variations**, or **Handle** elements, as represented by the medium-coloured section in each bar. Still, the presence of the darkly coloured bar sections showed that two non-identifier category elements may coexist in a display field.

## 4.4 Demographics of People Who Change Their Display Names

Our final research question was:

> Are changes to the display name related to the demographics of age or sex?

The 444 contacts comprised somewhat more males than females. The primary participants reported 232 males, 189 females, and 1 male/female (the account was known to be used by a couple). The sex of the remaining 22 contacts was not reported.

The dominant age range of the 444 contacts was between 21-30 years old. Table 1 summarizes the age demographics of the 444 contacts, as reported by our 12 primary participants. Since the exact age of each contact was sometimes uncertain, we used age group categories to capture their estimated ages.

We then analyzed whether age or sex of a person was related to the number of changes that person made. First, we removed records for those contacts whose sex was not reported. We then performed a chi-square analysis on the remaining 421 contacts to determine whether there was a relationship between sex and the rate that a person changed their display field. Sex and display name change rate were found to be independent, $\chi 2$ (5, $N$ = 421) = 7.54, $p$ = 0.183. That is, no relationship exists between the sex of a person and how often a person changes the display name.

We performed a similar chi-square analysis for age and display name change rates, where unreported people were excluded. Age groups were collapsed into three age ranges: <20, 21 to 30, and 31+. This was done for analytic reasons, since several cells in the chi-square analysis would have contained counts of less than one with the original divisions. Age range and name change rates were found to be not independent, $\chi 2$ (10, $N$ = 413) = 20.507, $p$ = 0.025. That is, a relationship exists between the age of a person and their likelihood of changing their display name. This result will be examined further in the discussion.

**Table 1: Age distribution of contact group**

| Age Group | Count | Percent |
|---|---|---|
| <15 | 7 | 1.69 |
| 16-20 | 24 | 5.81 |
| 21-25 | 179 | 43.34 |
| 26-30 | 126 | 30.51 |
| 31-35 | 36 | 8.72 |
| 36-40 | 18 | 4.36 |
| 40+ | 23 | 5.57 |

N = 413, Unreported = 31

# 5. DISCUSSION

The most important thing revealed by our study is that a good number of people persistently used the display name feature to publicly broadcast information about themselves to their friends, and that this happened outside of individual chat sessions. They did this in spite of the fact that IM display fields are not explicitly designed to be a public broadcast system. This suggests that systems should be designed to better support this kind of broadcast activity. Details are discussed below.

## 5.1 Interpreting the results

**People change the information in their display field.** From this study we have learned that the changing of the information in an IM display field is not an oddity or something done occasionally by certain individuals. Rather, it is a popular behaviour: 42% of users in our study changed their display name, and 25% did so several times a week or more. This behaviour happens in spite of the fact that the Instant Messenger client we studied does not make changing the display name immediately accessible (e.g., through direct manipulation): people had to raise menus, dialog boxes, and form fill the text.

**People use the display field for identification, to give information about self, and to broadcast messages.** People used the limited text that could be displayed in the display field in rich ways. Seventeen different categories were needed to describe the various communications placed in the display field.

Stepping back, three themes encompass these categories. The first theme is *Identification*: "who am I"? The second theme is *Information About Self*: "this is what is going on with me". The third theme is *Broadcast Messages*: "I am directing information to the community". These are described separately in the following three sections.

***Identification is fundamental.*** Identifying oneself to personal contacts by typing one's own name in the display field is the original purpose of this feature; the name replaces the default email address as a way to uniquely identify a person. This proved necessary because e-mail addresses are a poor substitute for a name; some email services enforce cryptic email addresses, and others are so oversubscribed that all but the rarest names are already taken.

While people identified themselves in several ways, inserting one's real **Name** or a recognizable **Variation** of it (e.g., initials or nicknames) proved the two most common communication categories. **Handles** was also popular (a constant representative

**Figure 5: A typical display field showing how people retain identity (Name), followed by other information (Activity)**

name that superficially resembles nicknames in IRC or discussion groups on the Internet [1][17]). Regardless of the differences between these categories, in all cases the names, variations or handles presented are not used to maintain pseudo-anonymity or complete anonymity as in IRC or MUDs. Rather, the identifier is something that the contact group uses to recognize a known individual.

Another indicator of the importance of the Identification categories is that many users keep their name visible even when they add extra information to the display field (the black bars in the three identification categories, and the grey bars in the other 14 categories in Figure 4). People do this in spite of the limited display space: in a normally sized IM window about 30-50 display field characters are viewable. As well, the usual order of this information is a name followed by the extra information. A typical example is illustrated in Figure 5. This inclusion of identity is likely done as a courtesy behaviour so that others can distinguish between contacts without resorting to deciphering the e-mail address.

***Extra information is usually about self.*** Of the remaining 14 categories, the majority of them provide information about 'self'. Elements in these 'about self' categories dominate the frequency count (~85% of the non-name elements), with the top four categories providing information about **Mood**, **Comments**, **Activities**, and **Location**. These top categories all present information about the person at a moment in time: they annotate how they are feeling, what they are doing, or where they are. Similarly, the lesser used **Presence** category indicates if they are available, thus augmenting the preset status indicators, while **Quotes** and **Fun** are indirect indicators of state of mind and personality traits. Obviously, these people want to disclose an additional level of information revealing personal state and action to their community of friends, close contacts and collaborators. The regular association of this kind of information with one's name means that this information is truly about self; this is in sharp contrast to the personas found in chat systems, where people construct an artificial pseudonym identity through avatars or nicknames [1, 17].

***People want to be able to broadcast information without involving conversation.*** Most of the remaining categories (about 14% of the non-name elements) contain communicative messages intended for the group. In particular, **Messages, Notices, Questions** and **Directions** are categories that either provide information thought to be of interest to the group or are posted to stimulate a response. Most of these are undirected e.g., 'Does anyone know…'. Occasionally, a message may be specifically directed to an individual, yet this is done in a forum public to the community of contacts. Clearly, people are adapting the IM display field into a form of public broadcast communication facility; they are thus fulfilling one element of the broadcasting system described by Etzioni and Etzioni [5].

Since each user's contact list is unique, a responder (who may change their display name to respond to another's broadcast message) is likely not sending that response to the same community. This hampering of responses suggests that display names are less effective for creating the running dialogs common to IRC, MUDs and other public broadcast systems [6, 11, 17].

**Asynchronous messaging.** In MSN Messenger, the direct chat facility is session based. That is, direct chat cannot be used by one person to leave information for a currently 'Offline' participant to read later. In contrast, the display name persists across sessions, meaning that asynchronous communication to offline participants is possible. For example, consider the message 'SirMe - Happy Birthday, Angie!' that was found in the **Messages** category. By including this in his display name, SirMe is leaving an asynchronous message that Angie (and others) can see when they come on line.

**Younger users may change their display names more frequently than older users; sex does not make a difference.** The demographics of our study suggest some demographic trends, which are described below. However, we caution that, due to the way we collected data, the demographic findings and how they relate to display name changes are at best tentative. First, the age ranges of our secondary contacts (as being 14 – 65 years old) were likely heavily influenced by the fact that these contacts were culled from the lists of only 12 primary participants (from 22 – 50 years old), most of whom were within the 21-30 age group, weighing the data with a similar age range. Second, our data is incomplete as display field change data for secondary contacts was not collected when their associated primary contact was off line. Third, ages of secondary participants were estimated, which affects the analysis we could do. In spite of this tentative flavour, we include our results as they suggest trends and future areas of study.

We saw a fairly balanced number of males and females in our sample: 55% were male, 45% were female. The chi-square analysis for sex and display field change rates indicated that the two variables are independent, i.e., the sex of the participant does not suggest how often that person would change their display name. However, the chi-square analysis for participant age and display field changes suggests that they are related[1]. We subsequently examined the chi-square table data to compare the observed count with the expected count for each cell of age group crossed with rate. Discrepancies between the observed and expected counts indicate a pattern where younger users are more apt to frequently change their display name when compared to older users. This trend may reflect a "computer generation" gap where younger users would be more apt to change their display name. It could also reflect a culture gap, where younger users are using it for social reasons [8], while older users are using it for workplace purposes [6].

## 5.2 Implications for practitioners

People persistently use the display field not only to identify themselves to their community of contacts, but to reveal personal information about self and to broadcast messages. They do this in spite of the fact that the display field facility was

[1] While the chi-square test determined that the two variables are not independent, it does not provide details on how the two variables are related. If true values of age and average change rates were available instead of our estimated categories (a subject of a future study), other statistical analyses could be used to reveal this detail.

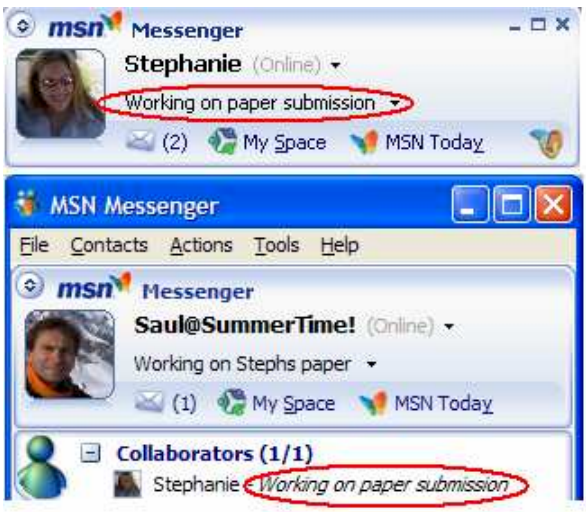



**Figure 6: MSN Messenger v7.0 separates editing and display of names and personal messages.**

designed for other purposes; the IM community co-opted this feature to fill their real desires and needs.

The first major implication is that IM and similar facilities need first-class interface features that let people broadcast identifying information, information about self, and public messages. Because some people change this information fairly often, this information should be easy to create and alter, e.g., through direct manipulation.

Some of these capabilities are only now being supplied by a few major IM vendors. For example, the new version of MSN Messenger (v. 7.0), released shortly after our study was performed), includes a dedicated space for adding and editing a personal message (Figure 6, top). A person can directly alter this text by clicking within it: no menus or dialog boxes have to be navigated or raised. Other people see this personal information as visually distinguished text, e.g., the italicized text within the contact list (Figure 6, bottom). The personal information message is also proprietary to the machine, similar to the display picture. Thus people can set unique location labels to various computers if desired, i.e. *home* or *work*.

The Community Bar (CB) [12] is a multimedia groupware system being developed by collaborators in our laboratory. Elements of its design are partially influenced by our study results. People within an ad hoc group inhabit *places,* and all see the equivalent of a contact list within a place. For example, Figure 7 shows a place called 'IM Paper' and three participants within it. To support 'Identification', each participant is represented by a 'Presence item', which shows running video (or photo) of them, their name. To support 'Information about self', the Presence item also includes optional personal information (which may wrap across multiple lines) that persists across login sessions. A person can quickly modify this personal information by a popup raised whenever he or she moves their mouse over their item (Figure 7, right side). To support 'Broadcast Messages', it also lets people broadcast and respond to public messages to all people in the group. This public broadcast is not available in MSN Messenger 7, For example, Figure 7 (bottom) illustrates a public text chat dialog that lets anyone in the group post messages; all see its contents and all can post responses.

**Figure 7: Snapshot of Community Bar displaying personal message space within presence item**

Not shown is a sticky note facility, where a person can post a persistent message to all. Finally, certain categories of information are supported. For example, 'Directions' are satisfied by letting people post a 'web item' (not illustrated): a thumbnail of a web page of interest that others can navigate to via a single button press.

Another implication of our study is that people use many different categories of information – especially when describing self – which in turn suggests that people are trying to provide others with a rich picture of themselves. Yet most systems, even the current ones shown above, only let people set one attribute of themselves in their personal message space (although they may combine these in a text fragment). Perhaps future systems will let people construct an 'avatar' of sorts with multiple attributes that distinguish these categories, so that (say) mood, location and activity are treated independently rather than compete for a small space.

While these (and likely other) systems suggest point design solutions to our implications, what is important is that our study has placed this work on a solid intellectual footing. It provides details of what people have done, and has identified the categories of information that people supply. For example, we suspect that MSN Messenger's inclusion of a personal information field arose because its designers noticed that people were moulding the technology to suit their needs, and they

wanted to "fix the interface" to better fulfill these needs. In contrast, our study helps designers understand why appropriation occurred in the first place. Looking at the 17 categories of communication that are used in messages found in the display name space, we saw that most are personal, or about the self. In taking over this space, users are not 'hacking' to make IM do totally different things. Rather, they are adding richness to their identity beyond their simple name label. They are expressing identity, and they own this expression by using a text field that only they can alter.

We also saw that there is some use of the display field for public broadcasting of messages. This suggests that there is a problem with the way we compartmentalize systems: IM systems with no real notion of groups or public broadcast, versus IRC and similar systems where public broadcasts dominate. The real solution likely amalgamates both: a system that somehow supports both public and private discussions between ad hoc (and perhaps non-overlapping) groups. To our knowledge, only very few systems (such as the Community Bar above [12]) are trying to tackle this fusion of genres.

## 6. CONCLUSION

Most studies of communication using instant messenger clients have been focused on the activities within the main chat window. In contrast, this study examined how contacts subvert IM technology to publicly broadcast information by adding extra text to their display name. We exposed patterns of behaviour, where we saw that almost half of the contacts we monitored change their display names with varying frequencies. We established a set of seventeen communication categories for the different types of personal messages added to the display field. We saw that people did want to identify themselves (the **Name, Variations** and **Handles** category), and that these were true identities that contacts would recognize versus anonymous pseudonyms not known by others within the social group. We also saw that the most popular communications were those that added personal information about self: a person's psycho-physiological status, one's current activities, details of their location, and expressions of personal comments and opinions. We also saw that people occasionally used it to broadcast messages to the group, a facility not otherwise available in IM. These findings suggest that personal information and public broadcast of messages should be provided as a first class interface feature in IM design.

This is just the first of a set of studies that could be done. Much has been discovered, although these results should be verified and refined further. For example, modest refinements of our study protocol would allow us to more precisely capture the frequency of changes within the display field and their distribution within the different communication categories. However, we suspect that the actual categories of communication will not change dramatically. More importantly, we intend to study behaviour and communication patterns within systems that provide explicit support for personal information supply (such as MSN v7.0) and public broadcast (such as the Community Bar).

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