

# Common Ground to Analyse Privacy Negotiation in Awareness Systems

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**Abstract.** This paper discusses how Clarke's theory of Common Ground can be applied to analyse how individuals connected by Awareness Systems jointly meet and negotiate their privacy needs. The exposition illustrates how Awareness Systems are a mechanism for helping individuals to meet their privacy needs rather than as a privacy threat, as a first impression might suggest.

## 1 Introduction

A core function of awareness systems is to push information about one's colleagues or social network to the periphery of one's attention and a vice versa. The decision of which information to share concerns the design and subsequently the daily use of awareness systems. At a first reading, awareness appear to be the flip side of privacy: a gain in awareness of another individual comes at a cost of that person's privacy.

This view though is rather simplistic. There are clear occasions when one desires to share information about themselves, desires to engage in social interactions while at other moments they may prefer solitude, isolation or to keep some information about themselves private in order to manage how they present themselves to others. This variable attitude and the behaviour of people pertains to their privacy needs and the mechanisms they adopt to manage their privacy. The term privacy is not used here in its colloquial sense of secrecy or confidentiality of one's own personal data from third parties (often assumed to be government organizations). Rather, we are concerned with privacy as understood in social psychology as "an interpersonal boundary process by which a person or group regulates interaction with others..."([1], p.6) or as a "selective control of access to the self or to one's group..."([1], p.18).

Social psychologists have examined needs, attitudes and mechanisms people use to manage their privacy in the domain of face-to-face interactions. There is little work yet that will provide a theoretical understanding of how individuals manage their privacy needs in the context of computer mediated communication. This work aims to address this problem. More specifically, we try to understand the role in privacy management of an awareness system, broadly seen as an always on, lightweight communication channel that aims to place information about one individual at the periphery of the attention of another, so that this information will be easily recruited but also easily ignored.

In the context of CMC, extant communication behaviours and privacy mechanisms (see Altman [1] for examples) that are part of our interpersonal social skills are severely constrained. A successful solution for privacy management would require that both sender and receiver's needs have to be addressed in tandem when disclosing private information [6] in what becomes a collaborative activity. For an effective collaboration, participants have to mutually develop a shared understanding that helps them jointly negotiate their meanings and understandings, i.e., senders' intentions and receivers' recognition of those intentions. Note that we do not concern ourselves with the related problem, of information security, where the confidentiality of one's information is considered to be under threat by external parties.

In this paper, we apply Common Ground theory [2] to show how awareness systems can support privacy negotiation as a joint activity. In the following sections we summarise some key elements of Common Ground theory and we discuss how they can help explain some known empirical results regarding the negotiation of privacy needs in the context of CMC.

### 3 Common Ground Theory

Clark's theory states that all communication behaviours are *joint activities* where participants share a common goal and the responsibility to achieve that goal. Every joint activity used *coordination mechanisms* that give participants shared basis for believing that they are all converging to the same joint goal. Those *shared basis* are what Clark calls *common ground*: "...a great mass of knowledge, beliefs, and suppositions they [participants] believe they share" ([2], p.12). The process of developing common ground, *grounding process*, involves a series of *contributions* each consisting in a pair of *presentation and acceptance*. In a contribution speaker presents an utterance to express a *meaning* and addressee gives evidence of *understanding* of that presentation.

The stronger the common ground that participants shared, the higher the possibilities to *cooperate* in the design of their presentations and acceptances, the lower the *collaborative effort* needed to succeed in their communication goal. People engage in two parallel tracks of actions when communicating. Track I attempts to carry out the official business while track II attempts to create a successful communication. It is in track II that speakers ask for confirmation and addressees provide evidences of understanding. Track II is a central component of Clark's theory to facilitate the grounding process.

Four aspects of track II guarantee lightweight presentations and acceptances of collateral signals and tacit actions: backgrounding (signals in track I should be prominent), simultaneity (actions in both tracks at the same time should be performing signals in both tracks in parallel), brevity (signals in track II should carry little information and should be limited in variety), and differentiation (signals of track I should be distinguishable from signals of track II). The concept of the two tracks has, to the best of our knowledge, not so far been used in analyses of CMC using common ground. Nevertheless, the definitions above relate closely to what is described by Nardi [5] as "interaction" and "outeraction".

The different aspects of track II support different representations of common ground, which are used as coordination devices. The *initial state* represents the

shared assumptions, cultural practices, etc., used as conventions. The *current state* corresponds to the shared external representations of the current situation used as explicit agreements. The *track of public events* represents the shared perceptual salient events used as precedents.

Considering privacy negotiation as a communication activity we borrow three concepts from Clark's theory as our basic vocabulary to identify the level of support of privacy negotiation in awareness systems: track II, common ground representations and least collaborative effort. The latter concept refers to the willingness of people to use "evidences enough for current purposes" to achieve an agreement. We consider that, representations of common ground in track II can provide "evidences enough for current purposes" so people can cooperatively ground their privacy/awareness needs.

The vocabulary helps us to describe the level of support of awareness systems to represent the different states of common ground (initial, current, track public events) in terms of the four requirements of track II: background, brief, simultaneously, distinguishable. To demonstrate how Common Ground theory helps describe and analyse privacy mechanisms manifested in the usage of CMC, we relate two published empirical studies to the elements of Common gGround identified above.

### 3.1 Analysis: Push-to-Talk (PTT)

Push-to-talk is a half duplex, lightweight cellular radio communication. A study done by Woodruff [7] found that the half-duplex, and lightweight aspects of the medium create a sense of reduced interactional commitment where users appreciated the immediate access to another person and the relatively low interactional demands of the various conversation styles afforded. The benefits observed relate to reduced openings and closings, delayed or omitted responses, reduced feedback, and interleaved interaction. Controversially, participants were reluctant to use PTT with others than very close friends.

In terms of track II support on one side the system provides lightweight presentation and acceptance mechanisms signalling briefly and in the background privacy/awareness needs. On the other side, in situation where the initial state of common ground represents a more competitive relation between the participants there is a need to ground more information about the current and recorded states that is not supported by PTT. The lack of support of track II to represent common ground *simultaneously* and *distinguishable* from track I obliged users to use mechanisms in track I to signal their privacy/awareness needs clearly increasing the interactional commitment.

### 3.2 Analysis: Media Space

Media spaces are CMC tools of audio and video equipment to support synchronous collaboration. Dourish, et al [3] analyses personal experiences over a long period of use of a v/a link connecting two physical offices (share office). The study reports that users jointly created and developed new social norms to deal with the emergent communicative practices afforded by media spaces. Nevertheless, lack of context cues did not facilitate collaboration between users in the adoption of new norms.

Analysing how media spaces support track II to provide context cues, we identify a lack of *background* features (use of image size, blurriness, etc.) damaging the exchange information in the periphery and a lack of support of *brief* non-verbal signals to control lightweight communication devices such as preambles, plausible deniability, etc. The lack of support of track II to represent background and brief context cues as shared basis did not facilitate a joint decision process on how to behave under unfamiliar situations.

## 5 Conclusions

Awareness systems can be seen as a source of Common Ground that can help to develop a sufficient shared basis to help users to mutually agree on their privacy/awareness expectations. In track II communicators can use collateral signals and tacit actions to present their privacy/awareness needs. The discussion above illustrates that different CMC designs can be analysed with respect to how they support negotiation of privacy and awareness needs through track II. It suggests that common ground can provide a much needed theoretical framework for analysing Privacy negotiation processes in CMC. Our current research seeks to collect empirical evidence to demonstrate this possibility and to suggest a method for evaluating computer mediated communication systems with respect to how well they support individuals satisfy their privacy needs, whether these concern the will to share information and to interact socially or conversely, to avoid interaction and to keep information private.

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