Indexicality of Language and the Art of Creating Treasures

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ABSTRACT
The indexicality of language refers to the linkage between the language and the situation of use for determining the meaning of what is being said. In this paper I describe how a player of a location-based treasure hunt game called geocaching uses indexicality of language in creating clues when hiding treasures. Based on this account, the skill, I argue, in creating an exciting treasure depends on understanding the disjunction between the context in which the clue is first interpreted and the context in which it receives its final meaning. An interesting clue should therefore contain both a literal or conventional meaning and a situated meaning, and the situated meaning should only arise when the player is close enough to the treasure.

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Geocache, location-based computing, GPS (Global Positioning System), context, indexicality, language, field study.

ACM Classification Keywords
H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous. J.5. Arts and humanities: Linguistics.

General Terms
Human Factors, Languages.

INTRODUCTION
Geocaching is the modern version of the age-old treasure hunt, but reinvented by use of Internet and GPS-positioning technology. Whereas in traditional treasure hunt people known to one another hide treasures for one another, like a father hiding a treasure for his kids, in geocaching everyone gets to hide treasures for everyone, everywhere, throughout the world. In a sense geocaching could be interpreted also as a way of learning: people explore the environment through the eyes of another – a stranger. This assumes that a treasure hunt is not only about the hunt per sae but also about entering the mind of the person who hid the treasure – what is the treasure about, why did this person hide it here, what is she or he trying to tell us? Such experiences can be very powerful, connecting people in new ways, and opening up new ways to look at how strangers can collaborate, enjoy one another's efforts, and all this without possibly even ever meeting each others in person.

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PREVIOUS RESEARCH
Although an interesting location-based activity, there is not much research on geocaching. There are a lot of journalistic style writing as well as tutorials and books acting as introductions to the hobby [e.g., 6, 8, 9]. Other writings focus on forestry management concerns associated with the activity or the potential of geocaching for educational purposes [5, 11]. The most significant research on geocaching is done by Chavez and Schneider [2, 3] and O'Hara [7]. The studies by Chavez and Schneider provide quantitative characterizations of underlying motives (such as, relaxation, being close to nature, or doing something with the family) based on questionnaires whereas O'Hara makes a more detailed qualitative account of the practices of geocaching based on diaries maintained by the participants and in-depth interviews.

Previous research begins to give a fairly good picture of the overall activity but still lacks in detail. For example, there is no mention of how the clues for finding geocaches are constructed and how each clue uses the context of the participant in building an adventure, and how participants interpret the clues together with the environment in which the treasures are hidden. In this paper I will go through this process in more depth, discussing how one particular geocacher creates a set of caches and how a group of geocachers go and look for them. In the concluding chapter I will discuss some of the implications for the strategies available for the players in searching for the treasures. I will also discuss some of the problems I encountered during the field trial with technology. But first, let us look at what I mean by indexicality of language and how it becomes a resource in geocaching.

INDEXICALITY OF LANGUAGE

The indexicality of language refers to the linkage between the language and the situation of use for determining the significance of what is being said [1, 4]. Language in other words presupposes that it is interpreted in the appropriate context where the significance of terms and phrases receive their intended meaning. Suchman [10] makes an argument that language, like action, is situated and since the situations in which language is used are changing, new interpretations regarding the intent of others (including machines) change its meaning. That is, the meaning of language change as new evidence is made available for interpretation. This fluid nature of the meaning of language and the dependence with the context in which it is used has implications for HCI where the challenge has been to design readable interfaces that would communicate meaning in changing situations. However, as problematic as it may seem, the association of context and language is an interesting property that can be utilized in situated games, like geocaching.

Indexicality of language in geocaching

In geocaching the idea is to create a clue in the form of written language that somehow signifies how the cache is hidden. Sometimes this clue is the cache name, and sometimes there is a lengthier clue, such as a puzzle. Each cache also has a set of GPS coordinates that indicate the approximate area and direct the player to the right place where the actual search may begin. In this respect the use of GPS-technology is somewhat external to the focus of the investigation since it only brings the players to the desired location. Of course, sometimes the coordinates may be somewhat off if the signal to the satellites is weak. In such a case the clue becomes even more salient as the treasure cannot be found where the coordinates indicate.

I argue that a good clue is something that does not make sense before arriving at the location of search. Otherwise the player could anticipate in advance where and how the cache is to be found, which would demystify the cache hunt by articulating in advance the objective of the exploration. In this sense, the language used in the clue needs to be flexible for interpretation and the location of search needs to be unfamiliar to the player in order to ambiguate the *situated meaning* of the clue.

This gives some idea of the creative challenge involved in creating geocaches. Let us now discuss this process of creating caches with reference to field observations on how caches were hidden and found.

FIELD OBSERVATIONS: HIDING CACHES

A while ago I was in the field observing a geocacher named John create caches. John is an experienced geocacher although having taken up the sport only half a year ago. Since then he has made over five hundred finds, taken part in several geocaching events and was now organizing his second geocaching related poker game – his own modification of geocaching. It was Saturday morning and he was about to hide nine caches in a park that was later that day to host a picnic for geocachers. In this section I will describe how John hid the caches and created clues for finding them. A description of how a team of four players searched for them will follow in the preceding section.

The first hide he made he called “the can can.” It was a small plastic container with log book attached to the bottom of a large metal garbage can. It wasn’t placed inside the can but on the outside surface of the bottom since John wanted the players to lift the can in order to make the find. He wanted the search to be physical in the sense that one had to touch and handle the can that people normally don’t. The cache was hidden in the bottom of one can out of three, so John joked whether he should have in fact called the cache “the can can can.” When I asked John why he chose to place the cache there and call it the can can instead of the can can can, the reasons became obvious. The can can is a type of cabaret dance that originates from France and John explained that while studying photography at UCLA during one summer he went to London as an exchange student part of the UCLA extension program. Since he had always wanted to visit France and being so close by he decided to travel for a weekend in Paris and visit the Louvre art gallery. He remembers this incident well since the Louvre at the time was free of charge for all under eighteen, and since he had his eighteenth birthday it was of some significance to him to get the last chance of his life to get free into Louvre. Of course, this story of John in France and his acquaintance with the can can dance does not get told in the cache description, the cache is simply called “the can can” and accompanied with no other clues than the GPS-coordinates for the location of the garbage cans.

The next cache that John hid he called “pep rally.” Next to the parking lot in the park are the restrooms and alongside this wooden building are two blue-colored Pepsi vending machines. John wanted to make finding this cache physically challenging so he squirmed behind the vending machines and places the cache so that it could be seen when standing in front of the vending machines through a narrow gap but would require some acrobatics to get to. When I ask John what pep rally means he explained it is a type of celebration preceding a football game the intention of which is to get the audience in a cheerful mood. And John makes a point about the lingual similarity between the brand name Pepsi and the “pep rally.”

The third cache John called “play date.” In the park there is a playground built for kids. In the centre of it is a plastic construction with a shoot and ladders where children can climb, crawl and slide down the shoot. Next to the construction is a shelter with a seat presumably built for adults. John started hiding the cache in the roof support of the shelter but decided instead to place it on the roof. I asked John what he means by play date and describes it as an agreement between parents to bring their kids to play together. Such playgrounds are familiar to John since he and his wife have two young children of their own. The

fourth cache John hides in a thick bush and calls it "hail to the chief," making reference to president George W. Bush.

It is worth noting how the caches reflected the life experience of John, although in a superficial way. "The can can" represented youth and the time spent in Europe, the "pep rally" college football, the "play date" adulthood, of having a family and kids to take care of, and "hail to the chief" personal view on politics. Another observation is how the clues were ambiguous when interpreted without reference to the context of the caches. There seemed to be a level of mystification to them when out of context that invoked intrigue and motivated finding the missing piece of the puzzle to unravel the mystery. And the missing piece to the puzzle was the context from which the clue had been detached. In this way John used the indexicality of language to construct clues that had intentionally multiple meanings, the current meaning depending on the context it was being referenced to. The game then was about finding the correct context in which the mystification disappears and the clue makes sense.

FIELD OBSERVATIONS: SEARCHING FOR CACHES

Later that day groups of players went looking for the caches created by John. I joined one group that consisted of a woman named Leila, who had extensive experience geocaching together with her husband. However, Leila's husband did not want to participate. The other two participants in the group were a mother and daughter, and in this case too the father did not want to participate. The mother, Molly, and the daughter, Dorothy, were both novices and had trouble using the GPS-device, which had till this moment always been operated by the father. Both of the adult women had a GPS-device.

The team was given a sheet of paper with a list of nine caches with their names and respective coordinates for the GPS-device. Since the team had nine caches to find and the entering of the cache coordinates into a GPS-device is a slow process, the team decided to enter half of the cache coordinates onto one device and the rest onto the other, thus utilizing both of the devices to economize for time. But as both women entered the cache coordinates into the devices from the sheet of paper they abbreviated the names of the caches. As a result the cache names stored on the devices were something different to what was in the initial assignment. This is an example on how technology may participate in the alteration of the game play.

"The can can" cache was the first one on the list and the team decided to pursue it first. For some reason the coordinates were off and the team found themselves slightly diverted from the location of the garbage cans. To this point Leila did not use the name of the cache as a clue, but instead used the device to pinpoint the location. Now an outsider helped the team by pointing in the direction of the cans and the cache was given away.

The second cache to be searched was the play date. Leila seemed to be leading the search for this one as she had stored the coordinates for it on her GPS-device. We were soon at the playground. I asked Leila for the name of the cache and if she had any clues to where it could be hidden. She looked at here GPS and replied "play" being the name of the cache. She didn't appear to realize that what she had stored on her GPS was not the complete name. Or she simply assumed not having lost any valuable information when abbreviating and thus it made no difference. It could be argued that as far as finding of the cache was concerned, not much information was lost by omitting the "date" part of the expression, but the meaning of what the creator of the cache wanted to communicate was altered – no longer did it communicate of the cache creator having kids and play dates at playgrounds like these being a routine in his current life.

The team then went on to search for two caches before their last one, the "pep rally." Dorothy who had kept the paper with the full names of the caches was providing the team with the cache names. It had come to the team's attention by now that the cache names could in fact help in the search. When she told the next cache would be called pep rally I inquired from the team what it meant and whether it was some sort of clue. Neither of the adult women knew its significance. Dorothy then hesitatingly said that it brought to her mind cheerleaders, which is close to what John had in mind. However, Dorothy could not articulate what it translated to regarding the search as we were still at some distance from the location where the cache was hidden. As they approached it they wondered if the cache would be in the restrooms behind the vending machine. But soon after spotting the Pepsi vending machines alongside the restrooms they realized the lingual similarity between Pepsi and "pep rally" and focused their search around the vending machines. Dorothy spotted the cache in between the vending machines and now it was just a matter of gymnastics getting to it.

CONCLUSIONS

The field observations demonstrate how the context dependence of language becomes a resource in location-based treasure hunt. The player creating the caches uses language creatively in constructing clues with multiple meanings. Consider for instance "the can can" that means a cabaret dance or two cans or "can" as in the verb. I argue that these meanings can be divided into two categories: the *literal* or *conventional* and the *situated* meaning.

The literal or conventional meaning can be regarded as a context independent first impression for the cache hunt that needs to make sense without reference to the context in which the treasure is hidden. It gives some clues about the person having hidden the treasure, or at least the player searching for the treasure may be tempted to think so. For example, in the case of "the can can" and the cabaret dance, the player looking for the treasure may be tempted to think

that cabaret dance is not just referenced for the sake of making a good clue but of having personal significance as well (which it does).

The situated meaning is the context dependent part of the clue that should only make sense when referenced with the correct environment or object. It is of course possible that the player can guess the situated meaning before seeing the environment or object, in which case the treasure hunt becomes a search for the guessed object. Alternatively, the situated meaning can be so well hidden that the player needs to "work with the environment" looking for objects within the GPS-designated area and try to figure out what the situated meaning could be. Consider for example the "Hail to the chief" cache.

The field observations therefore suggest that the player may use at least two different strategies in finding the treasure, depending on whether she or he is able to guess the situated meaning of the clue. If the player is able to guess the situated meaning she or he only needs to look for the correct object in the environment whereas if the situated meaning is well hidden, the player can only iterate between the objects and the clue and try to uncover the hidden meaning with reference to the correct object. To maximize the difficulty of the treasure hunt the player hiding the treasure therefore needs to make sure that the situated meaning of the treasure is well hidden within the clue and cannot be guessed without reference to the correct object.

The above discussion underlines how treasure hunt is much more than merely hiding a treasure in a difficult place. It is a mind game in which the player hiding the cache and the player looking for the cache each have to think about the way the other thinks. In addition the clues studied here had strong relevance in terms of personal history of the player having created them. I suggest that such processes in which the player is busy solving a problem while accompanied with a strong presence of personal history may be good for bonding people in a community. Such bonding may have desired consequences for example for cache creation, where players may want to return a favor or give back to the community.

Limitations of the study and future research

The field observations underlined an additional aspect of treasure hunt. In the second field observation account I reported some issues involved with technology when searching for caches. First there was the problem of losing the clue as players abbreviated the cache name due to limited input functionality of the device. Later they resorted only to the stored name on the device and overlooked the possibility of the cache name containing a clue to where the treasure could be found. This problem of losing the clue in translation is linked with the second problem, with the accuracy of the location technology. I argue that because the technology is so accurate in pinpointing the location of the treasure, there is no real need to bother with solving the clue mentally. This of course affects the way players bond with one another: as they resort more to "artificial intelligence" in place of practicing mental skills and trying to enter the mind of the person having hidden the cache they lose some of the potential to familiarize with one another. In this respect further research would be required in order to understand how superior accuracy of positioning technology may hamper a "mind game" and how mindfulness in location-based games could be invigorated.

As for the limitations of this study, it is clear that John is not representative of all geocachers and probably more resourceful in creating interesting geocaches than the average player. It would thus be interesting to understand how a group of geocachers with mixed backgrounds, different levels of life and game experience could go about creating geocaches with both a literal or conventional and a situated meaning. It is yet unclear if a "mind game" would really emerge with a given group.

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