Pictures in Place:

Adolescent Usage of Multimedia Messaging in the Negotiation, Construction and Sharing of Meaning about Local Environments

by

Kenneth Y T Lim

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“Most people don’t take snapshots over little things - the used band-aid, the guy at the gas station, the wasp on the jello. But these are the things that make up the true picture of our lives. People don’t take pictures of these things.”

Seymour Parrish – protagonist in *One Hour Photo*, Twentieth Century Fox 2003

“To become completely lost is perhaps a rather rare experience for most people in the modern city. We are supported by the presence of others and by special way-finding devices: maps, street numbers, route signs, bus placards. But let the mishap of disorientation once occur, and the sense of anxiety that accompanies it reveals to us how closely it is linked to our sense of balance and well-being.”

Kevin A. Lynch – *The Image of the City*, MIT Press 1960

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CHAPTER ONE - INTRODUCTION

Understandings of what constitutes the discipline of geography have changed over time and across societies and cultures, not least during the twentieth century, which saw the rise and fall from prominence of, *inter alia*, regional geography, quantitative geography, systemic geography, and Marxist geography. One common strand that runs through these various schools has been, of course, that geography concerns itself with studies of spatial relationships, and the inter-relationships of man with his environment. Geographical thought, then, is at times analytic, at times comparative, and at other times inferential, though all the while being essentially visual-spatial in nature. Thus, more than thirty years ago, Tuan (1974) had already observed that

> in our mobile society, the fleeting impressions of people passing through cannot be neglected. Generally speaking, we may say that only the visitor (and particularly the tourist) has a viewpoint; his perception is often a matter of *using his eyes to compose pictures* [emphasis added]. (p. 63)

The research described in this thesis concerns itself with an investigation into these unique viewpoints, perceptions and pictures, that adolescents form and share about their local environments.

For the most part, geographical fieldwork focuses on the collection of empirical data about environmental variables as diverse as stream velocity and the demographic profiles of commuters. Such data are then used to inform the design and implementation of projects from the damming of rivers for hydroelectric power, to school-reports. The field interventions described in the present study differ from these, in that the focus is specifically on investigating the features in the environment in which meaning is invested by the adolescent

participants themselves – that is to say, the focus is not on the gathering of field-based data, but on the surfacing of environmental symbols and features which are perceived by adolescents to be of geographical relevance in the first place.

I have chosen this focus in order that insights might be gained with respect to how spatial relations are organized in their minds. Catling (2005: 74), for example, has described how the understanding of maps comprises two key aspects, namely environmental mapping skills and map reading skills. Of the two, only the latter – map reading skills – are explicitly taught in the formal geography curriculum in schools in Singapore.

Through the present study, my aim is to investigate how the former – environmental mapping skills – can be enhanced (and therefore brought subsequently to bear in the so-called 'map reading' component in the formal geography curriculum) through specific field-based tasks. The two components of environmental mapping skills are environmental awareness and wayfinding. Catling defines the former as involving "the capacity to discriminate between useful environmental cues and non-relevant ones", while according to Jul (2001: 55), wayfinding can be modeled as a "problem-solving and decision-making activity, in which participants determine a sequence of actions which will lead to a desired goal, including discovering what options are available and deciding among them".

These options of wayfinding are "sequences of locomotional steps" believed to lead from the present location to the intended destination. In cases when the intended destination is beyond the individual's immediate vista space, then the sequences of steps are subdivided into a set of intermediate locations. The order of traversing these intermediate locations is known as the route.

Wayfinding is thus particularly helpful in enhancing map understanding in that it facilitates the construction of cognitive maps (the term 'cognitive maps' was first coined by Tolman (1948), and has been defined by Peuquet (1998: 49) as "the cognitive representation of geographical-scale space").

One application of the research to effective teaching practice would thus be to inform how the spatial intelligence of adolescents might be augmented by their participation in learning interventions in the field, as well as in class. In this way, it is my hope that the teaching of map reading – which is at once a basic skill of geographical literacy, yet also one of the hardest for learners to acquire – might be more effectively bridged and mediated. This contention is supported by Catling (2005: 80), who has argued that "there is a strong link between children's environmental experience and the development of their environmental mapping skills, which has a positive impact on their development of map reading ability".

METHODOLOGY

The study explores how mobile phones can be used as tools for collaborative learning around two geographical tasks designed to give insights into how adolescents perceive their local environment. After piloting the intervention with fourteen- and fifteen-year-olds from one school, it was carried out in three other schools, which were selected on the basis that the socio-economic and academic profiles of their students were similar.

The first task required pairs of students to help their peers navigate unfamiliar environments, using only text- and picture-messaging. Through an analysis of which aspects of these environments students find meaningful,

teachers would be in a better position to translate geographical concepts from the textbooks into terms and metaphors to which teens can more easily relate.

In the second task, teams of students explored a bounded area, looking for pieces of evidence which they could use to support non-congruent points-of-view. They recorded these pieces of evidence pictorially, using the phones, and exchanged these pictures in real time while still in the field, physically separated from each other. This kind of task was only feasible given the affordances of the present generation of camera phones. Students used the evidence to explore given geographical issues regarding the bounded area, in the format of a Structured Academic Controversy. By analyzing the pictorial exchange, teachers may be able to better understand which particular aspects of their local environments teens perceive to be relevant to the given geographic themes.

The data obtained from these two tasks is discussed in Chapters Four to Six of this thesis. Specifically, Chapters Five and Six elaborate upon the performance of three of these student-teams – as three cases – in detail. Such a case-based approach was chosen over alternative qualitative research methodologies (such as ethnography and grounded theory (Cresswell, 1994: 143)) because it represented the most appropriate way of investigating the research questions of this study, which are presented later in this chapter.

COGNITIVE MAPPING AND FRAMES OF REFERENCE

Part of the field intervention task in the study required students to successfully transpose orientations of their physical selves in three-dimensional space to two-dimensional pictorial representations thereof. Commonly referred to as ground-to-map transpositions, this is otherwise known as cognitive mapping. As stated

earlier, Peuquet (1998: 49) has defined the term as “the cognitive representation of geographical-scale space, from the immediate space of one’s own neighbourhood, to very large and complex spatial entities such as towns and cities”. It therefore follows that “the traveler must necessarily build a cognitive map of the environment by integrating observations over extended periods of time, inferring spatial structure from perceptions” (Kuipers and Levit, 1990: 124).

In doing so, the traveler – or, as is the case in the present study, the student – is navigating and constructing his (or her) own naïve geography, defined as “the body of knowledge that people have about the surrounding geographic world” (Egenhofer and Mark, 1995: 131). Catling (unpbl.) contends that naïve geographies are at once personal, but are also shaped by social interaction.

In all, sixty-one males and sixty-two females, aged between fourteen and fifteen, took part in the intervention described by the present study. Rieger (1999) suggests that males tend to perform better than females in the reading and interpretation of maps. This contention is to some extent supported by Anstett (2000), citing the work of Gail Armstrong-Hall, who elaborates that males are more predisposed to using certain spatial skills which are helpful in the successful completion of orienteering activities. These spatial skills are:

- Tracking using sense of direction, which involves moving to a new location through unfamiliar territory with few landmarks;
- Imagined mental movement of objects, which comes into play when the protagonist cannot see the subject and must picture the direction of movement; and
- Abstract mental movement in any direction at any distance, which requires the recognition of an object in the environment from multiple perspectives.

While cognitive spatial awareness involves the combination of personal knowledge and understanding of spatial layout, patterns and processes, it is also generally agreed that such cognitive maps are not founded upon the metric Euclidean geometry of traditional maps (Kuipers, 1982). Indeed Levinson (1996), building on the work of Bryant (1992), describes at least three Frames of Reference (defined as a co-ordinate system which spatially relates objects and their components) – cognitive maps demand that the individual employ mainly Relative or Egocentric (viewer-centric origins and axes) and Intrinsic or Allocentric (origins and axes are anchored to prominent reference objects such as buildings) Frames of Reference. As will be seen in subsequent chapters, participants' differential use of these various Frames of Reference had much bearing on their success (or lack thereof) in one of the wayfinding component of the field-based intervention.

Indeed, it might be argued that the effective use of such Frames of Reference might be predicated upon one's spatial intelligence. Gaughran (1996) has described a hierarchy of so-called spatial factors, progressing from image holding and comparing, to planar rotation, to orientation, to kinetic imagery and finally to dynamic imagery. Of most relevance to the present discussion is the orientation factor, tests of which have been designed by Guay and McDaniel (1978), and Shepard and Cooper (1982). These tests, which involve the mental rotation of three-dimensional objects, form part of the basis of the pre- and post-tests in the present study.

Taylor and Tversky (1996) contend that when asked to describe environments, one of three spatial perspectives is often used; namely the gaze tour, the route perspective or the survey perspective. They have mapped these spatial perspectives onto the respective Frames of Reference, such that for small

environments which can be observed from a single point of view, the Egocentric Frame of Reference is used in the gaze tour, while for larger environments (such as the neighbourhoods used in the present study), the route perspective corresponds to the use of the Allocentric Frame of Reference, with the Extrinsic Frame of Reference used during the survey perspective.

Iachini and Logie (2003) go one step further and postulate that in physical, rather than laboratory, environments, Egocentric Frames of Reference are employed more than their Allocentric counterparts. This contention was investigated through the analysis of the communication transcripts generated by participants as they attempted to guide each other in the wayfinding task. In contrast, navigating using Euclidean properties (such as distance walked) is referred to as using Extrinsic Frames of Reference (for example, North). While the language of these latter maps is familiar, and includes elements such as the scale and legend, cognitive maps require a new syntax to describe (Lynch, 1960; Jiang, 1998).

One such element is the axial line, which is essentially a line of sight and a proxy for intervisibility. A set of axial lines around a person represents the viewable space, sometimes termed the vista space. In turn, a set of vista spaces eventually forms the entire urban environment in which the individual finds himself. The task of determining how to traverse one's vista space essentially constitutes the wayfinding component of the field-based intervention.

Vista spaces are punctuated by landmarks, which vary from naïve geography to naïve geography. In giving route directions, Denis et al. (1999: 148) contend that the use of landmarks is "quasi-mandatory", because the other mode of purposeful navigation – following a compass heading – is metrically

incompatible with common forms of spatial discourse. As will be seen in subsequent chapters, this is supported by the research data – as is the fact that such landmarks are not necessarily the largest or most prominent structures in the vista space, instead they are that which reside in the individual's memory, and therefore that which the individual finds most meaningful (Couclelis, 1996; Siegel and White, 1975).

Further, Denis et al. (1999: 147) describe three sets of cognitive operations which are usually required by the leader (that is, the person giving directions, as opposed to receiving them) in the production of route directions – namely, the activation of spatial knowledge relevant to the route, usage of the spatial knowledge in defining the route, and finally the formulation of the procedure that the person being led would have to use to move along the route. In the present study, emphasis is placed on the lattermost of these cognitive operations, first by prescribing the route, and second by having the leader himself walk it.

The spatial knowledge relevant to the route would therefore already be in the leader's recent memory registers. Tulving (1972) makes a distinction between episodic and semantic memory. The former is the kind of memory which receives and stores information about specific events. The latter is the organized knowledge a person possesses about concepts and their interrelationships. The two are not entirely discrete. Learning involves associating events with concepts in semantic memory as examples. Cognitive maps, consequently, comprise both semantic and episodic memory. In the present study, the resultant spatial discourse between the leader and the led was subsequently analysed in terms of its descriptions as well as the instructions therein.

In summary, some of the fundamental cognitive processes used in wayfinding and route description have been outlined above. In turn, wayfinding and route description form one of two complementary halves in the field-based intervention described by the present study. The data obtained during this part of the intervention will be described in detail in Chapters Five and Six, in which three cases of participants' wayfinding attempts will be presented. These narratives will shed light not only on the naïve geographies of adolescents, but also on how these geographical understandings are communicated to each other and co-constructed.

RESEARCH QUESTIONS AND PURPOSE

The preceding discussion has thus intimated two broad purposes of the present research. They are:

- To investigate how students help each other explore and navigate unfamiliar environments, through an examination of their synchronous discourse, as well as of pictorial clues with which they provide and request of each other;
- To investigate how students transpose their conceptions of actual locations into two-dimensional representations of space, and the extent to which these transpositions can be successfully communicated to their peers.

The key research questions that delineate the bounds of my study are therefore:

- how do adolescents seek to explore and understand the local environment in which they find themselves?

- how are such understandings of three-dimensional environments communicated, through text and pictures, with their peers?
- what are the mechanisms (including textual and non-textual cues) which adolescents employ to coach their peers to successfully navigate alien environments?
- how can the technologies of social software, specifically messaging technologies, augment and / or detract from the semiotic processes of making and sharing meaning about place? In other words, how sound is Myerson's (2001) hypothesis that 'a person who had gained knowledge through genuine dialogue might have a richer understanding than someone who had just got hold of the data as swiftly as possible'?

LIMITATIONS OF STUDY

The present study does not attempt to address possible demographic variables, gender excepted, which might have governed the degree of success with which synchronous online exchanges can take place.

Further, the research is confined to an investigation of how text- and picture-messaging can augment (or detract from) communication between members of existing social groups, as opposed to the extent to which it can foster group creation, or enhance interaction between large or spatially non-contiguous groups. Likewise, other forms of social software, such as instant messaging, blogs and wikis, are not explored, in the present research, for their potential pedagogical uses.

With respect to curricular coverage, the intervention limits itself to the use of messaging technologies in orienteering and debating activities. While there are

doubtless many potential applications of multimedia messaging in more explicit scientific enquiry and linguistic skills acquisition, an investigation of such is beyond the bounds of this study.

From the point of view of the students involved in the research intervention, each student was only taken on two fieldtrips – one for each task. Students therefore had no opportunity to have subsequent attempts at the task (specifically to try to improve their orienteering performance). The limited number of fieldtrips, and the number of classes involved, was ultimately dictated by the constraints of the academic timetable and class size.

These limitations will be revisited in the concluding chapter, in which they would be put into perspective in the light shed by the analysis and discussion of the research data.

SIGNIFICANCE OF THE RESEARCH

The data for the research described in this thesis was gathered from January to July 2004. The research questions are therefore worth asking because it was during the period of the study that the cost of technologies, such as text- and picture-messaging, fell to levels which made them accessible to many students in technologically more savvy societies, such as some economies of the Pacific Rim. The adolescents in schools in Singapore today are already predisposed to using such devices. For example, an informal survey of 800 Singaporeans between the ages of 14 and 29 years, carried out by the Singapore Polytechnic in August and September 2004 found that more than half of the respondents spent most of their phone time composing text-messages, as opposed to actually talking to another party.

Kress (unpbl.) has noted that “the shift from the dominance of the book and the page to the new dominance of the screen is paralleled by a change in canonical modes of representation, away from the dominance of writing to an increasing use of image”. The ubiquity and transparency of mobile messaging technology invites investigation into how teachers might best channel these technological sources of motivation towards improving the learning process. To quote Rheingold (2003): “the emphasis on social software today ought to be a reminder that the real capabilities of augmentation lie in the thinking and communication practices these tools enable.”

As an example of such capabilities, the present research investigated the extent to which students might have their sense of spatial awareness and map-reading skills enhanced through the study, exchange, and subsequent real-time negotiation of photographs of environmental landmarks which were meaningful to the participants themselves. Specifically, the intervention represented an attempt to introduce an intermediate step into traditional pedagogies of map-skills in order to bridge the cognitive chasm between real-world three-dimensional environments and their symbolic representations on two-dimensional Cartesian coordinates (that is to say, topographic maps). This was achieved by inserting the learner into the very environment which was abstractly represented and by tasking the learner to explore, share and construct meaning about this environment with other learners.

In terms of similarities to prior and concurrent research studies by others (as described in the next chapter), the intervention which seems closest to this study is the Ambient Wood Project, first conducted by the University of Sussex in 2002. In the Ambient Wood Project, primary school students used handhelds and

walkie-talkies to learn more about the natural ecological systems in the local woodland. Pairs of students explored the nearby woods, and described specimens of interest to their peers through their walkie-talkies. Background information on the specimen is subsequently transmitted to their handheld by the teacher. In this way, students are given opportunities to consolidate and reflect upon their explorations.

Where the Ambient Wood Project was founded upon serendipitous discovery and free exploration, this study was characterized by a more structured approach, in which students were explicitly tasked to analyse issues from non-congruent points-of-view.

Further, instead of using walkie-talkies as tools for social construction, text- and picture-messaging were used in this study. These not only allowed the social exchanges to be captured more readily for subsequent analyses, but the use of picture-messaging and the eventual transposing of the exchange of messages onto a map of the area for peer critique, especially allows insights into how teens perceive their local environment and communicate these perceptions to others.

Although little work has been carried out so far to investigate potential pedagogical applications of text- and picture-messaging, various authors have long recognised that there do exist fundamental differences between speech and writing, as media of expression.

For example, Short, Williams and Christie (1976) concluded a review of media studies by stating that the “absence of the visual channel reduces the possibilities for expression of socio-emotional material”. From almost the opposite