

# Matching and Mismatching Social Contexts

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**Abstract.** Social Contexts are specific types of recognised social situation for which specific norms, habits, rules, etc. are developed over time. The unconscious and embedded natures of these make them difficult to change –becoming deeply entrenched over time. How cultures relate depends, in detail, on whether contexts in each culture are identified with ones in the other, brining with this identification engrained assumptions and expectations. This chapter explores the implications of social context to the problem of integrating cultures, examining each of the possible subcases in turn. It concludes by noting that *how* social contexts in different cultures map onto each other (or not) matters greatly in terms of both the outcomes of meeting cultures and the steps that might be taken to facilitate their integration. However the possible interactions are complex and dynamic, so the chapter ends by considering simulations that might start to explore such complexities.

Keywords: social context, social simulation, cognitive modelling, context-dependency, integration, culture

## 1 Introduction

Context is everywhere in the human social and cognitive spheres but it is often implicit and unnoticed. When one is involved in trying to understand and model the social and cognitive realms it becomes increasingly clear that it is a crucial factor. In particular this chapter will argue that is it vital if one is going to map how different cultures can relate to each other.

This chapter starts by discussing context in general, importantly trying to distinguish which of the many meanings that the word “context” has. It then goes on to briefly discuss the pervasiveness of context-dependency in human cognition and how social contexts acquire their distinct identity, becoming entrenched in society. The next sections, which analyse how cultures might map onto each other in terms of their different social contexts, are the core of the chapter. These sections go into some detail about the various possible cases of match/mismatch both in terms of the identification of a social context as well as the assumptions, norms, habits etc. associated with the contexts. The chapter ends with the implications of this in terms of integrating cultures and studying the complex integration processes using agent-based simulation.

## 2 About Context

The word “context” is used in many different senses and has many different analyses (Hayes 1995). It is somewhat of a “dustbin” concept, in that if a theory or idea does not work the reason may be assigned to “the context”. Thus to many (e.g. linguists) context is a subject that is to be avoided due to its difficulty. I cannot touch on all the approaches to and models of context in the literature, but will give a brief introduction to context in general, including some major conceptions of it, and a few of the issues surrounding it. This will, hopefully, clear the ground for the main suggestions of this chapter and avoid *some* of the possible confusions.

### 2.1 Situational Context

The situation context is the actual situation where some events or other described phenomena take place. This could include the time and location, but could include all that is the case about that situation, including: who was there, the knowledge of those people, the history of the place and all the objects present. In this sense the context is indefinitely extensive, it is notionally includes all the circumstances in which an event or utterance occurs.

Such a context may be able to be specified adequately (if rather uninformatively) by giving the time and place of the events<sup>1</sup>, but the relevant details might not be effectively retrievable from this. For example, the fact “I was reminiscing about our summer holiday” might well not be detectable from the time and place except by the person doing the reminiscing. Thus when talking about the situational context it is almost universal to abstract from this to what is relevant about that context, or what might be commonly understood. Thus the phrase “the context” (as in the question “what was the context?”) may mean “those factors that are relevant to understand this particular occurrence” even though it may refer to the situational context in general. Thus to understand what someone is saying to you, you might ask “what was the context?” and get a description of the circumstances, e.g. “I was on the train”.

## 2.2 Linguistic Context

Whilst the situational context could include anything, at least in theory, the linguistic context is composed of the words that surround an utterance or phrase. This typically indicates the words that precede or frame the target of understanding, but could also include common knowledge that could be reasonably be expected to be known by the listener/reader, e.g. elements of the relevant culture. Sometimes this is taken to be the same as all that which is necessary to understand some natural language.

Historically this has been what one appeals to if there seems to be no detectable foreground features to explain the meaning. However more recently more positive attention has been focused on context in linguistics. For example, Peter Gardenfors (1997) has said (pragmatics being close to contextual considerations in linguistics):

*Action is primary, pragmatics consists of the rules for linguistic actions, semantics is conventionalised pragmatics and syntax adds markers to help disambiguation (when context does not suffice).*

Clearly the linguistic context could refer to almost any of the language or culture that surrounds an utterance, and hence is not something that can be captured in its entirety. Often context is thought of as linguistic context because the interactions that are being considered consist of linguistic communication.

## 2.3 Cognitive Context

Clearly many aspects of human cognition are context-dependent, including: visual perception, choice making, memory, reason and emotion (Kokinov and Grinberg 2001). What seems to occur is that the human brain categorises kinds of situation which it is able to later recognise, largely without conscious effort. A lot of recall, learning and inference is with respect to a recognised kind of situation. This abstraction of a situation in the brain – the recognised kind of a situation – is the *cognitive context*. It is the cognitive correlate of the situational or linguistic context. Such cognitive contexts could be identified using a description of the kind of situational context that invokes them or else by the set of all the knowledge, norms, expectations, habits etc. that are immediately accessible once recognised.

It is essential that different contexts can be effectively and reliably recognised but this does not mean that they have to be consciously recognisable as distinct contexts and labelled, they may be unconsciously recognised by all the members of a community but never named; maybe their features are distinctive and consciously recognisable but too complex and fuzzy to be completely specified.

Dividing thought about the world into these cognitive contexts, which are learnt and recognised in a rich, automatic and largely unconscious manner, and the more formal and conscious learning, recall and reasoning that is done *within* such contexts seems to be an effective heuristic for thinking about the world we live in. It is far from obvious that such a heuristic will always be possible, or even helpful. The assumptions and advantages of this heuristic are discussed below.

It is that fact that we flexibly learn to recognise contexts and what is appropriate to them that allows for the culturally-specific development of social contexts.

## 2.4 Social Context

Many of the cognitive contexts we have learnt seem to correspond to recognisable kinds of social situation. Examples include: greeting, lecturing, and a political discussion. Once established these seem to be self-perpetuating, in that habits, conventions, norms, terms etc. can be developed by people who recognise the context, but in turn this might mean that the context is more recognisable as an important kind of situation which

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<sup>1</sup> As is essentially the approach in (Barwise and Perry 1983).

has its own characteristics. Thus social contexts can be co-constructed over time and passed-on (mostly by experience) to others. Thus they have cognitive correlates as well as social ones.

When people are asked to describe the context, they will often do it in social terms. Thus it is that the social context, although it is a special case of situational context is closely linked to the synchronised cognitive context that participants have learnt to associate with situation, because it is often the social aspects that are important in terms of communication and understanding. It is because of the context-dependency of human cognition that when the social context is recognised, experienced inhabitants of that context will know what set of norms, habits, terms, etc. are associated with it and automatically bring them to bear in their social organisation. Thus one of the consequences of the context-dependency of our cognitive capabilities is the prevalence and importance of social context in our understanding of the world<sup>2</sup>.

It is, of course, social contexts that we will be primarily concerned with in this chapter, although these must largely correspond to cognitive contexts in the minds of the society's actors for these to be realised<sup>3</sup>.

## 2.5 Identifying and Talking about Context

One of the difficulties in discussing context is that they may well not (a) be accessible to us (b) identifiable even if they are accessible or even (c) definable in precise terms even if we can identify them. This is due to the complex and largely unconscious way in which context is recognized. Rather we often have to try and deduce what the relevant contexts are by introspection and other observation.

Despite this, we often talk about contexts as if they were discrete “things”, however it needs to be understood that *for our conscious selves* they may not be the case. Thus “the” context is an abstraction of the aspects of those background features that define it, whether or not this is a meaningful or reifiable entity for us. To simplify the discussion I will generally talk about contexts in the sections below as if they are well defined identifiable entities, but the caveats just mentioned need to be always taken into account. This difficulty means that *the* context for any situation is often not made explicit or represented – those involved may well not be aware of the cognitive context they are assuming.

Thus although we may not be able to describe or specify contexts explicitly due to their fuzzy, complex and inexact nature<sup>4</sup>. However social contexts are more recognizable than some other kinds of context, due to their institution into the fabric of our society and the fact that they need to be readily recognizable by all actors.

Two items of terminology that will facilitate the discussion below. When I talk about “a” or “the” context (social or otherwise) it means the recognized kind of situation where specific rules, norms, language, dress, habits etc. may hold. The “contents” of a context are those specific rules, norms etc. that are associated with that context that will be widely known by the social actors participating in them. The analogy is of a set of containers of these specific items of knowledge that are taken off the shelf and accessed depending on the recognized kind of situation.

## 3 The Context-dependency of Human Behaviour

### 3.1 The Pervasiveness of Context-Dependency in Human Cognition

People behave differently in different situations – the rules, norms, expectations and decisions that people apply in “a lecture” will be very different from those they apply at “a celebration”. I would claim that this is not a coincidence, nor only an apparent difference masking underlying universal patterns of behaviour – but that context-dependency is fundamental to the way humans deal with the world. There are several reasons why this claim is a strong one. *Firstly*, there is the simple observation that the same people behave very differently in different social contexts and that different people behave in similar ways in the same social context. *Secondly*, there is a lot of evidence that human cognition is context-dependent in many respects. Kokinov and Grinberg (2001) list some, including: visual perception, choice making, memory, reasoning and emotion, preferences, and language comprehension. Context-dependency seems to be hard-wired in our cognition, and it would be very surprising if this did not result in a context-dependency in terms of behaviour. *Thirdly*, one can see why it might

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<sup>2</sup> Of course, as with language (Deacon 1998), it may be that some of the survival value of our brains is that it allows the co-construction of social context with which to associate sets of applicable norms, behaviours, knowledge, terms etc.

<sup>3</sup> Although they are also often instituted in physical forms as well, for example a lecture theatre or wedding chapel.

<sup>4</sup> It is this fuzzy and indefinable aspects of cognitive context, that it is something that is recognised in a rich, complex and defeasible manner that makes context impossible to simply express within a statement, e.g. if *B* is true in context *A* this does not mean there is any statement  $A' \rightarrow B$  where *A'* defines the conditions that correspond to context *A*.

have evolved in our species. If, as seems likely, a significant part of the evolutionary advantage that our brains provide us is in our ability to organise and adapt in social groups – as suggested in the “Social Intelligence Hypothesis” (Kumer et al. 1997) – then the ability to learn to behave in a highly context-dependent manner can be explained in terms of the significant advantage that would result from *groups* being able to develop different shared norms, habits and protocols to suit different tasks and situations. So, for example, how to behave on a fishing expedition can be developed to suit the conditions and technologies available for that activity, but the patterns of the whole group would change quickly and simultaneously if a conflict with a competing group arose, or a storm was coming.

Human cognition seems to involve the combination of rich, unconscious, fast and vague context recognition with relatively simple, conscious, slow and precise reasoning and learning relative to the context (Edmonds 1999a). Dividing the world into similar kinds of situation and dealing with it on that basis makes the conscious reasoning, learning, and decision making feasible (Greiner et al. 2001). The flexibility of this combination or rich Machine Learning kind of mechanism with slow but specific Artificial Intelligence style reasoning and adaptive mechanisms seems very effective and powerful for the particular environment and social existence that we have (Edmonds and Norling 2007).

One of the features of this combination is that the recognition of the kind of context is done unconsciously, we are not usually aware of this process, unless we make a mistake. Thus our brain automatically (and apparently seamlessly) is providing us with the knowledge, expectations, habits, vocabulary to deal with the kind of situation we are facing, without any conscious thought on our behalf. This rich and unconscious context recognition can make it hard to identify or even talk about context, which is perhaps why it has not had the attention that it deserves.

Also, it must be said, that there has been a bias against context-dependent understandings of social and psychological phenomena on the grounds that it is not “scientific”. It is true that universal models and understanding is preferable if they are possible, but there is no reason to suppose<sup>5</sup> that the world has been so conveniently arranged for us in this respect (Edmonds forthcoming).

Regardless of our ultimate philosophical views on the existence of universal underlying mechanisms, in practice it is sensible to understand and model human behaviour as context-dependent. This is particularly true in the social and cultural sphere where reductions to putative universal underlying mechanisms are currently no more than a theoretical commitment.

### 3.2 The Development and Entrenchment of Social Contexts

Whilst general types of environmental situation may well be identified and learnt by people (roads, clearings etc.) it is in the social sphere that context is delineated in the most obvious manner. This is because situations that are recognised as a kind of context become entrenched as the result of social processes. Thus if a situation occurs, such as a lecture, then it may be recognised by others too. Over time particular rules, norms, ways of behaving and language might be invented to suit that kind of situation. The more particular things pertain to it, the more clearly it is recognisable. The more clearly it is delineated the more it is likely that things will be invented or adapted for that kind of situation. In other words the context becomes socially entrenched via the co-development of its identity and specific content.

For example, consider the *lecture*. It is likely that early lectures were held outside or simply in people’s houses. They might well have been much more fluid than the lectures we are used to, with people coming and going during it, and more of a dialogue, or even barracking, during the lecture. The lecture may not even have been distinguished from other kinds of teaching or discussion. However over the years the lecture has developed into a sharply defined institution. We build special rooms to hold lectures in. People are trained from an early age how to behave in a lecture, that it is not allowed to disrupt a lecture, that one can expect the lecturer to have some expertise in what they are talking about, that limited amounts of questions will be allowed to be put but not free-form dialogue. It is now trivial to recognise a lecture and we all know how to behave and what to do in them.

All cultures, through necessity or invention develop a series of kinds of situation that have different purposes or provenances and which are correctly recognised by the members of the culture. That is, it is not only the expectations, habits, language, actions, norms, dress etc that will have developed differently in different cultures but also *when* different sets of these pertain. These kinds of social context structure the different cultures, in ways that its members recognise. In other words, social context has a crucial role in the social embedding of individual action (Granovetter 1985).

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<sup>5</sup> Other than sheer optimism.

## 4 Implications for How Different Cultures Map onto Each Other

The principle point of this chapter is to point out that the existence and identity of the entrenched social contexts in cultures will have a huge impact as to how those cultures relate to each other. That is to say the *structure* of cultures matter.

Sometimes the social contexts that have developed within different cultures will roughly coincide. That is to say the broad identification, function and style of a social context in one culture will be identifiable in another, even if the content and scope differ somewhat. Thus a service of religious worship may vary greatly from culture to culture in terms of what is expected of people within that service, when it happens, its place in relation to other aspects of society etc. etc. but is still broadly recognisable as such. Other examples of this include a court of law or a wedding.

Why these are identified as being of the same kind, or indeed why they are even identifiable as the same kind is complex and sometimes mysterious. It may be that the social institutions have travelled across the world with the spread of technology, people, trade, empires or religion. It may be that the commonality can be traced to a need or function that is the same for people everywhere, for example a funeral or cooking. It may even be that situations with different roots come to be identified as belonging to the same category, for example a musical performance. Of course, it is highly probable that some social contexts that are identified as the same have little in common but some relatively unimportant features. A meal might involve some eating by definition, but the meal of a solitary diner experiencing a variety of flavours in a *haut cuisine* restaurant might have nothing to do with the ceremonial eating of unleavened bread at the Jewish Passover festival.

In other cases the social context in one culture may not have anything that corresponds in the other. So the social context of a commuter train may not have much in common with travelling in a nomadic community. Sometimes a new social context appears that does not spread to other cultures, or has not spread yet. There may be no need for a babysitting circle in places where childcare needs are dealt with purely within an extended family. What is acceptable in one culture might not be acceptable in another, so a “rave” (where large numbers of young people gather to dance to hypnotic music with an accompanied use of drugs and alcohol) would simply not be tolerated in many countries.

Of course, deciding whether or not one social context in one culture corresponds to another in a different culture is highly problematic. Social phenomena are horrendously complex, changing and subjective. It may even be that, ultimately, it is impossible to come up with precise identifications that can stand up to academic questioning. However this is not the point, however problematic the identification of social context across cultures is, the fact is that people *do* identify some social contexts as similar across cultures and this effects their judgements and reactions to elements of different cultures. How these social contexts are perceived, and the social consensus on this matter *does* have a definite consequences for how and when cultures can integrate.

The central point of this chapter is that integrating an element of one culture with another will be very different in cases where the social contexts are widely considered as of the same kind to those cases where the social context of one of the cultures is not recognised as having an equivalent in the other. That is to say that the structure of social contexts, as well as the “content” of those contexts matters. The reason for this is that the *scopes* of social contexts (*when* they are considered to occur) are very difficult to change, often deeply embedded within a culture, and to a considerable extent unconsciously assumed.

This analysis implies that cultural integration will be fundamentally affected by the structuring of social contexts in each culture. The case where the contexts largely overlap (e.g. an academic lecture) will be very different from when they do not (e.g. some religious contexts). This, in turn, implies that there will be some very different kinds of cultural integration corresponding to these different cases.

### 4.1 Different Kinds of Integration that May Occur Given Different Correspondences Between Social Contexts

Let us consider some of the possible cases of correspondence, or lack of it that might occur when different cultures have to co-exist and hence encounter each other. Table 1 lists four basic cases of match/mismatch: where a social context in culture A does/doesn't have a corresponding social context in culture B, and where the “content” of the social context in culture A is compatible/clashes with culture B. Of course the author recognises this is a simplistic categorisation but these differences come from pragmatic social considerations and facilitates discussion of each case.

Table 1. Four cases of match/mismatch

	<i>The scope of social context in culture A does not correspond to anything in culture B</i>	<i>The scope of social context in culture A does correspond to a social context in culture B</i>
<i>The “content” of social context A is roughly compatible with culture B</i>	<b>Case 1</b> Compatible New	<b>Case 2</b> Roughly Compatible
<i>The “content” of social context A significantly clashes with culture B</i>	<b>Case 3</b> Clashing New	<b>Case 4</b> Internal Clash

**Case 1: Compatible New**

In this case there is a social context in culture A that does not correspond to anything much in culture B, but the content of that social context is largely compatible with the norms, ethics, habits etc. of culture B. Thus a new pastime that is transplanted with the movement of people to a new culture can simply add to the menu of choices in the receiving culture, and recognised as such. Indeed it may be that it becomes a cherished context within the receiving culture and, over time, become embedded within that culture as a new context there. This case is largely unproblematic, since there is no confusion that the context is new, nor any competition as to the detailed identification of that kind of situation. There may have been no such thing as “homework” (a specific piece of work set by a teacher for the pupil to do out of school and handed in to be marked) in some Asian cultures, but as a potentially useful addition to the life of children can be simply added-on if it does not conflict with other patterns or duties.

**Case 2: Roughly Compatible**

In this case there is a social context in culture A that many people would identify as essentially the same (or indeed “the same”) as a social context in culture B, and the nature of what happens in the context in culture A is roughly compatible with that in culture B (it is almost impossible for it to be identical, even with an institution trying to make it so). This case is problematic in so far as people might simply assume the content and identification of the situations to be completely the same and there are small differences. Thus instead of dealing with a situation using well-entrenched habits associated and triggered by the context, some conscious thought and adaption might well be necessary. Thus if one goes to a religious service in another country, even one within the same global institution, then there might be differences in norms about lateness, talking during the event, style of dress, etc. An unthinking reaction might lead to a negative reaction to these differences (e.g. “they had no respect, talking and chatting all through it!”).

In this case bringing the differences to the foreground, pointing them out and the different reasons and roots of the differences, i.e. explicitly educating people about the differences can help ease any dissonance that might have occurred. The trouble is that the habits and assumptions associated with particular social contexts are largely automatic and unconscious otherwise. Thus, in both US and UK cultures there is a well-recognised social context of “greeting and getting to know a person” within such events like parties, meetings etc. However (to generalise broadly) it is largely the norm within US culture to tell the other about oneself as a way of opening up the conversation and in the UK it is the norm to ask the other about themselves for the same purpose. This can lead to the case where after a first meeting between a US and UK citizen they come away with negative impressions of each other (“the US are always bragging about themselves and never once asked me what I do” and “the UK people are so snobby and close he did not tell me anything about himself but kept me at a distance” being stereotypical reactions in this case). Sometimes simply pointing out the differences can be enough to sort these misunderstandings out, in other cases habits are so ingrained or beloved that people are unwilling to adjust possibly leading to minor mutual irritation.

**Case 3: Clashing New**

In this case, there is a social context in culture A that does not correspond to anything much in culture B, i.e. it is “new, but the content of that social context is either incompatible with the norms etc. of culture B or it is perceived as being problematic from the point of view of Culture B. The “intruding” social context is not identified with social contexts in the receiving culture by many of those in that culture. Of course such an intrusion may be a matter of perception and not, ultimately, a matter of practical, legal or moral incompatibility.

Thus there may be a neutral or positive reaction from people who identify a Mosque with a Church, and Islamic prayer and worship with Christian prayer and worship to the plan to open an Islamic Centre near the site of the 9/11 terrorist attack, but a negative one from those who see Islam as basically alien to them – an intrusion into their society. Whether the incompatibility is real or perceived, the conflict it can trigger might be very evident in the form of peoples' actions and rhetoric. Without making a judgement there are several possible outcomes to such a situation (in general).

The receiving culture might decide to ban or discourage the new kinds of social situation from taking place. This might or might not be successful, depending on the lengths they are prepared to go, the level of conflict with the sending culture that they are willing to tolerate, the importance and embedding of the social context within the sending culture. There are cases where this has been largely successful (e.g. monogamy in the West even for immigrants from countries which practice polygamy), and cases where it has not worked (e.g. the past attempted suppression of churches in China).

After a time it might be that the new context is accepted in the receiving culture. As new generations grow up with the “problematic” social contexts being part of their social environment, it may not seem so threatening. Of course, this depends on the incompatibilities not being fundamental, so this acceptance will occur if either: the perceived incompatibilities become accepted over time, or the incompatible elements are adjusted by the incoming culture so that it is acceptable. Such a process of acceptance and/or adjustment can be facilitated with the involvement of the receiving culture's people in the introduced context (either directly through participation or indirectly via social contact), both in helping correct misperceptions but also in the introduction of the receiving cultures norms and values to those in the incoming culture.

#### **Case 4: *Internal Clash***

In this case the social context of the incoming culture is identified with that in the receiving culture, but there are incompatibilities in terms of what happens within that social context. For example, “waiting for a bus” is a social context that is recognised widely throughout many cultures, but the norms of how one behaves when the bus arrives might differ. There is an obvious and direct conflict between the norms of queuing (the people enter the bus in the order they arrived at the waiting place) and walking on without regard to order as quickly as possible. The former might well resent the latter as “pushing in” illegitimately, and the latter might be frustrated at what they perceive as the “unnecessary” formality concerning a simple action of entering a bus, especially in cases where there is room for all. Both views may react on the basis of deeply entrenched habit and norms, and resent the other pattern of behaviour, often attributing onto the others bad motivations and character.

In some of these cases there is no easy resolution, but that one or other pattern of behaviour will win out. It may be that in the long run social influence determines the outcome, either newcomers are persuaded to adopt the norm of queuing in the UK, or it may be that this norm falls into disuse. Sometimes these clashes are decided by enforcement, with reference to “fundamental” rights and duties of a society that incomers or inhabitants must abide with. In France it was decided that wearing a head covering in many public situations was illegal so it was in this case that the incomers were forced to adapt to the existing norms. In the US it may be that the principles of freedom of religion and expression would make such a law impossible, and it be the duty of the receiving culture to be tolerant.

However another response to this case (Internal Clash), is to encourage the differentiation of contexts, so that the contexts with respect to culture A and culture B come to be considered as separate kinds of situation and thus avoid the conflict due to the expectations of people of it. Perhaps an example of this are variations of the academic lecture in some of the more traditional Islamic world, where the lecture hall is arranged so that male and female students are screened from each other.

#### **Case 5: *New Contexts***

A case that is not covered in the above classification is when a new social context is created that is separate from those in either cultures. Such a context might be created to ease the interaction of different cultures, since neither culture will have engrained expectations of such a context. This might reduce the misunderstandings that might arise, since all participants are aware they are not in any of their “home” contexts. An example of this might be the international business meeting which has gradually evolved to be distinct from a normal business meeting in any one country<sup>6</sup>.

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<sup>6</sup> The fact that such a context derived from that in a particular context does not prevent it developing into a new and separate context.

## 4.2 The Implications for Attempts to Promote Social Integration

If it is indeed the case that the social contexts, along with their associated habits and expectations are relatively difficult to change (once entrenched), then this has consequences for what might be effective at promoting cultural integration or, conversely, avoiding cultural conflict. What is likely to work will be dependent on which of the cases above one has. Case 1 is largely unproblematic. In Case 2, education (explaining the differences) and making the unconscious assumptions explicit, bringing them into the open might be effective. In Case 3 there might well be no adjustment possible and the receiving culture simply has to decide whether it will tolerate the “intrusion”. In Case 4 the only thing to do is adjudicate as to what can occur and what the fundamental rights are, hoping that time makes the alien familiar. Examples of Case 5 should simply be encouraged as the easiest medium-term approach to establishing working interaction and dialogue.

Of course, these prescriptions are simplistic and imprecise. The dynamics of perception, context and interaction can easily make them otiose. Also the fractal nature of social contexts (sub-contexts within contexts etc.) can make any useful analysis of how contexts might correspond hopelessly complicated. Finally what a social context *is* depends crucially on how they are perceived, and so changes of perception might result in apparently radical and quick changes in the scope of social contexts. However, it is also equally clear that a generic approach to considering how cultures relate and/or integrate which does not take their contextual structure into account could be woefully inadequate.

## 5 Simulating the Integration of Cultures

### 5.1 Representing both cognitive and social aspects of social context

Clearly there is a lot that is not known about: how social contexts and social norms interact, how they develop and fall into disuse, how people recognise social contexts, how group identity and signals and social contexts interact... Etc. etc. To start to understand and unpick these complex and complicated interrelated factors we need to simulate them – since there will be a severe limit to how much one can keep track of these implications informally. The micro-macro link here is important, in other words it is essential to understand *how* the abilities, biases and intentions of individuals determine and are determined by the higher-level social constructs such as social context and norms.

If the above analysis is at all correct then (a) the awareness, identification and representation of social context is essential to fully understand how cultures might integrate and (b) the dynamics of cultures, with their constituent individuals, social contexts, norms, habits, assumptions and interactions could be highly complex. Together these indicate that in order to get a fuller picture, agent-based simulation is the most appropriate tool (Edmonds 2010). This is because this technique can (a) represent some of both the cognitive and social aspects involved in social context and (b) track some of the complex interactions between social context, perceptions, habits, norms and actions of the individuals concerned.

However simulations that take seriously *both* the cognitive and social complexity in terms of what is represented is rare. It has tended to be that in many social simulations the KISS principle<sup>7</sup> rules as far as the cognitive model of the agents is concerned, concentrating on how complexity can emerge from the interaction of many relatively simple individuals. This is the approach exemplified in (Axtel and Epstein??). Clearly one can use such simulations to discover possible ways in which social complexity could occur, but this does not tell us how complexity in observed human societies occurs<sup>8</sup>. There *is* a community which takes the representation and simulation of human cognition seriously – the cognitive modelling community. This community does seek to represent in detailed simulations how we think. However it is very much from the individual point of view – understanding how an individual thinks. The social situatedness of human cognition is rarely touched upon here, and thus explorations of how the social embeddedness of human social artefacts, such as social context emerge, are maintained etc. are not possible.

However there are some projects that are starting to include representations of both cognitive and social complexity in their simulations. An example (though not about social context) is the EMIL project (Conte et al. 2010) which did seek to simulate the twin cognitive and social aspects of social norms, allowing the exploration

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<sup>7</sup> “Keep It Simple Stupid!” the engineering principles that one should only introduce complexity after simpler approaches have been shown to be inadequate – the opposite is “KIDS” (Edmonds & Moss 2005)

<sup>8</sup> Of course one can make the heroic assumption that the nature of human cognition does not matter when it comes to the social layer (e.g. Ye and Carley 1995). (Gilbert 2006) argues that one does not always have to accurately model cognition in social simulation. However work such as (Edmonds and Moss 2001) shows that sometimes the cognitive model can have a significant effect on social outcomes, which implies it cannot be ignored.



of norm emergence in terms of both mental perceptions of obligations and the social patterns that co-developed with these. A similar project is needed to start detangling the co-dependence of individual learning and perceptions of social context and their institution and embedding within the practices and artefacts in society.

## 5.2 Some existing simulation work that points in these directions

It is notable that very few social simulations represent any of the processes for dealing with such context-dependency. That is to say, the agents in social simulations tend to be endowed with cognitive processes which are not sensitive to, recognise or use context. If the situation in which the agents are being represented can be considered as a single so that all interaction can be considered as taking place within a single agent, then this is reasonable since one then does not need context.

However many simulations aspire to be a more general theory of social interaction. In this case, one has to assume that either the simulation is to be taken only as an analogy or that the simulator thinks that people's behaviour, norms etc. will be so similar between social contexts that including mechanisms of context recognition, dependency, etc. are unnecessary (Edmonds 2010).

In the former case where the simulation is used only as an analogy, then this is valid because humans are experts at applying analogy in a context-dependent manner, adjusting its assumptions and form to be appropriate to its domain of application.

In the later case, where an essentially context-independent algorithm is used to represent a highly context-dependent process must, at least, be the legitimate target for doubt. Whilst the psychological realism that is necessary in a social simulation does depend upon the purpose of the simulation and the level of aggregation (Gilbert 2006), it is certainly not the case that the results of a simulation are robust against changes in the cognitive model being used (e.g. Edmonds & Moss 2001).

There are not many simulations which represent some aspects of context-dependency in their agents, but there are a few: (Edmonds 1998) used a cognitive learning model specifically because it included some aspects of context-dependency; (Schlosser et al 2005) argue that reputation is context-dependent, (Edmonds and Norling 2007) looks at the difference that context-dependent learning and reasoning can make in an artificial stock market, (Andrighetto et al. 2008) shows that learning context-dependent norms is different from a generic adaption mechanism, and (Tykhonov et al. 2008) argue that the definitions of trust mean that trust is also context-dependent. (Alam et al 2010) present a model of the exchange and family structure within a Mexican village based on the cognitive model of choice called "endorsements" (Cohen and Grinberg 1983). They justify the choice of this particular mechanism by the way it can result in context-sensitive choice.

These show that, at least in some cases, that context-sensitive cognition can make a difference. The fact that it can make a difference is not very surprising given the important role it plays in human cognition and society.

There are approaches to including cognitive context within the learning and decision-making of agents. (Andrighetto et al. 2008) use an approach based on social norms, whereby some of the habits and knowledge of agents are dependent upon the social context, in the sense of which group they are part of. (Edmonds 2001b) suggests a particular algorithm and approach to learning appropriate cognitive context. This did not achieve the co-development of cognitive context due to the anti-cooperative environment they were embedded within but did show that what is perceived as context can be learnt along with the "content" of these contexts, in a rich and "fuzzy" manner.

However it must be said that cognitive contexts that implement cognitive dependency are thin on the ground. This indicates that more work, both foundational and applied is needed if social simulations that can start to represent social context are to become useful.

## 6 Conclusion

Culture is structured in a fundamental manner by social context. Any attempt to understand social integration or promote it will need to take this into account, not as an "add-on" but as starting point. This chapter aims to convince that this is the case and indicate some of the ways forward in terms of simulation modelling, understanding and promotion. Such advances in modelling need to be part of a broader range of approaches with studies to gather evidence as to how and when social contexts "collide" is needed. Without such evidence to validate the simulation models at many different levels (Axtel & Epstein 1994) the simulations will be limited to exploring abstract possibilities only.

## Acknowledgements

The research was done partly under grant GR/T11760/01 and partly under grant EP/H02171X/1, both from the EPSRC. Its support, along with the support of the MMUBS is gratefully acknowledged.

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