

# Mario, Luigi and Dave: The Effect of Language on the Social Structure of a Bilingual Online Mobile Game

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## ABSTRACT

In this paper, we explore the structure of a social community built in an online game that was released in two languages, specifically examining the behaviours of players involved in inter-lingual interaction. This asynchronous social game was released simultaneously in Italian and English. The player base was seeded with English and Italian players but allowed to grow organically without restriction. Despite the built-in segregation by language, we found that the entire player-base formed into a single social network and developed strategies for overcoming the challenges faced by a multi-lingual game community.

Using Network Analysis, we break down the community in the game based on language and play style. We demonstrate that the behaviour of both English and Italian players was equivalent, and that play style had no effect on the likelihood of players deliberately engaging in inter-lingual communication.

In the context of the strategies used by the players in our experiment, we discuss game design patterns that provide incentives for users to behave more socially and how to create tools to enable the players to cross the lingual and cultural barriers in online games.

## Keywords

Social Games, Internationalisation, Online Communities, Social Networking

## 1. INTRODUCTION

Internationalization of online games has long been an issue for games developers. Strategies for dealing with the issues have traditionally been based on technical considerations due to geography and synchronous play issues due to differences between time zones. This often results in segregation of players based on common language into different instances (or “shards”) of the game, to lower the barriers to entry and bring new players into the game in an environment that is already using their native language.

The rapid growth of social games on the web and online social networks such as Facebook or MySpace have sidestepped many of these issues through asynchronous interactions between players who are equally able to participate in the game community regardless of physical location. There is no reason why players should be segregated by language, since there is no synchronous communication. Therefore all players are most usually a part of the same world regardless of location and native language.

Despite the worldwide availability of an asynchronous game built on existing platforms, the choice of deployment language is

perhaps the most important factor in determining the language players will adopt within the game. The number of these officially supported interface languages can be expected to create an implicit segregation of the players based on interface. For example, if an interface is available in Finnish, there is a reasonable expectation that players may communicate with other players in this language. We may also guess that the Finnish players will play more often with other Finnish players than Italian players due to the language barrier, even though there is no technical barrier preventing them from this inter-lingual communication.

The question that this paper explores is that when there are at least two officially supported languages, what are the effects on the social behaviour of players who otherwise share a single, persistent game world? Do players segregate themselves based on language or is this not as important as might be imagined?

## 2. FAMILIARS

Familiars is an asynchronous social game built around the concept of collection (for more detail see <sup>1</sup> and [8]). Players adopt virtual creatures (“Familiars”) and give them arbitrary tasks to complete with the aid of the community. Other players locate familiars by geographic search and can choose to help with a task by providing text and photographs as content.

The game can be played entirely through a web browser, and there is a client available for J2ME enabled mobile phones. Both web and mobile versions are Italian language by default, but are fully translated into English.

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<sup>1</sup> [www.familiars.eu](http://www.familiars.eu)

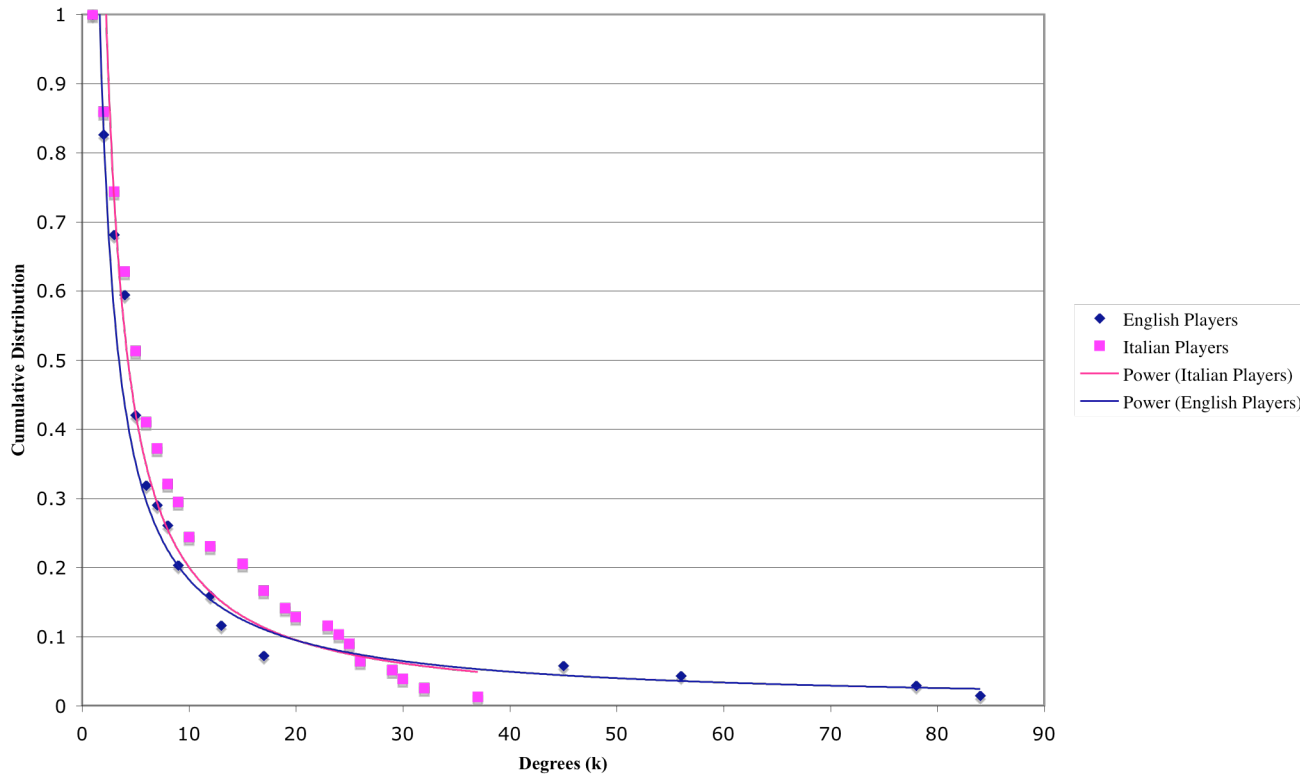


Figure 2 - Degrees ( $k$ ) by Language



Figure 1 - Familiars Mobile Client

Players are ranked against one another based on their social status, and can view their standing at any time. Social effectiveness is provided via measures of reciprocity (proportion of interactions that have been reciprocated) and centrality (number of distinct players connected to).

During the summer of 2008, Familiars was subject to a long public summative evaluation. Participants were invited from Italy and England, but registration was open to the public to allow for viral growth.

Country	Players
Italy	37
United Kingdom	35
United States	11
China	10
Canada	4
Japan	4
France	3
Australia	3
Switzerland	3
Germany	3
Other (22 Countries)	27
Unknown	70
<b>Total Registrations</b>	<b>210</b>

Table 1 shows the geographical distribution of players according to the location they self-reported during the tutorial section of the game. Due to the initial “seeding” of invitations, the most common player locations are Italy and the UK. The registration location for one third of the player base is unknown due to those players either failing to complete the tutorial or reporting an unlikely location such as the middle of the ocean.

### 2.1 Language

The clients (web and mobile) were available in both English and Italian. Despite Italian being the default language, nearly two-thirds of the player-base changed to English (76 Italian clients compared with 134 English). Of users that self-reported their location as Italy, 7 chose to use the English language client, and 9 users from English speaking countries chose to use the Italian version of the game.

## 3. SOCIAL STRUCTURE OF A BILINGUAL GAME

Since the game was developed with a built-in implicit segregation through language, there was an expectation of segregation between communities. For example, we expected that Italian players would most likely only choose to interact with other Italian players, and that if they did interact with English, they would choose to use the English language for these messages.

In analysis of the social network built by the players, the opposite is true. Despite the barriers to communication players built a single contiguous social network including every player in the game.

The social network behind Familiars is a *small world* [13] network in that no matter the position within the social graph, each player can trace a path to any other user through a chain of mutual acquaintances. The small world network contains 147 players and the average number of “hops” taken to reach any other player in the network ( $L$ ) is just 2.314. Only 147 out of the 210 registered players went on to interact with other players in the network. The others either left the game after registration or only interacted with themselves.

The growth of the network is also *scale free* [3], and the distribution of social connections within the game obeys a power law. In practical terms this means that “the rich get richer” in the social environment, and as with many social games, new players are much more likely to be involved with a popular player than anyone else [13].

Based on breakdown by language, we found that there was no significant difference between the social behaviour of the players.

Figure 2 shows the distribution of players based on the number of social connections they have within the graph ( $k$  degrees).

### 3.1 Hardcore Distribution

The scale free nature of the social game network highlights the differences in play styles between players, in particular how the actions of a small number of highly active players impact the rest of the social game environment. This “hardcore” group (AKA “Power Players” [11]) are so important to the network of the game that if they were removed, the social structure of the game would cease to be cohesive, causing the player base to fracture into a number of smaller isolated clusters.

We classified the player-base into three distinct groups of player based on the properties of the social network, using a novel

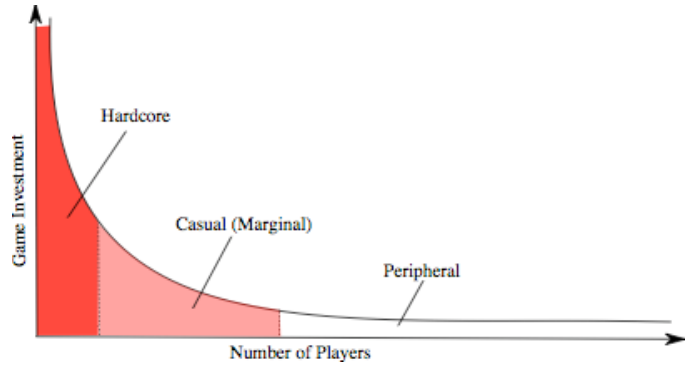


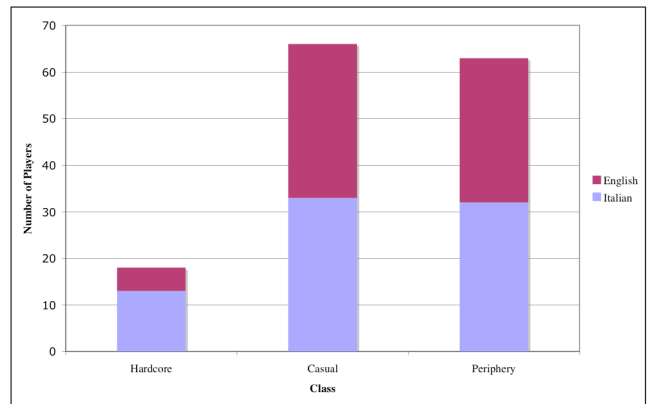
Figure 3 - Classification Split

technique based on existing work in play styles classification[4][5]. This classification system is described in detail in [7]

- *Hardcore* players are the core highly active users without whom the “small world” structure would collapse.<sup>2</sup>
- *Casual* players are those less active players who are still involved with the game after removal of the hardcore
- *Peripheral* players are those that have only interacted with a hardcore player and never explored the game more. This is the “long tail” of users in the social graph [2].

Table 2: Classification of active Familiars players

Class	Italian	English	Total
Hardcore	13	5	18
Casual	33	33	66
Peripheral	32	31	63
Total	78	69	147



<sup>2</sup> Classification procedure removed players by highest degrees  $k$ , until the size of largest contiguous subgraph  $<$  the number of nodes in non-contiguous graphs.

#### Figure 4 - Player Classes

Table 2 shows how the classification splits the player-base into the different groups. The Hardcore in Familiars account for just 12.24% of the active player-base yet are responsible for 50.08% of the activity within the social network. The peripheral players in comparison account for 42.86% of the community yet are only involved with 10.45% of interactions.

Figure 4 - Player Classes- shows how the behaviours were evenly split between the two languages used by the users. Although Italians made the majority of the hardcore by the numbers, four of the five English language players had much more social impact than the rest of the hardcore, as can be seen in Figure 2.

### 3.2 Cross-Cultural Strategies

In Familiars, there are two major parts to the playful social communication. First, an owner of a familiar must create a “task” which is described using text (255 character limit). This acts as a provocation for other players to contribute to the task, so well worded or intriguing tasks are more likely to be rewarded with interaction.

The second part is the interactions themselves, which are responses to tasks and take the form of text, images and locations. Only a location is required (via self-report on a map), the text and image are optional.

Table 3 shows the breakdown of the inter-language interactions that happened during the trial. While both Italian and English players showed strong preferences for communication with their own language, players from both communities were involved in hundreds of inter-language interactions.

**Table 3:** Inter-language Interactions

To\From	English	Italian	Total
English	426	115	541
Italian	205	408	613
Total	631	523	1154

For further analysis, we coded the types of task into 4 classes: English, Italian for tasks created with that language, International for tasks either in both language (for example, “Best Colour? / Miglior Colore?”) or in some international form (e.g. described in terms of emoticons or onomatopoeic words) and finally nonsense for tasks that were empty or made no sense.

The responses by players were also coded based on whether the response was in English, Italian or International.

#### 3.2.1 Creating Tasks with Cross-Cultural Appeal

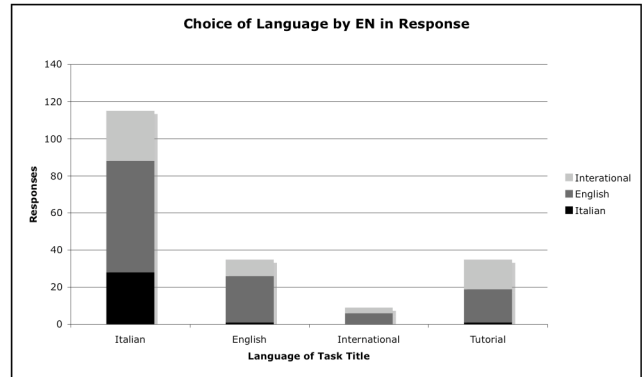
Both English and Italian players created a range of tasks that provoked interactions from players of the other language. Across 444 tasks created by players in total, 66.44% provoked inter-lingual responses.

Many of the tasks that did provoke inter-lingual responses appear to be *designed* for such a response. 65.76% of these tasks were created either using language neutral, dual language or even in the language of the other players (e.g. Italians creating tasks with English titles).

#### 3.2.2 Responding to Tasks Appropriately

Figure 5 and Figure 6 show how Italian and English players handled cross-cultural communication of different types. The charts show the choices of language (English, Italian or International/Neutral) that the players chose to use when

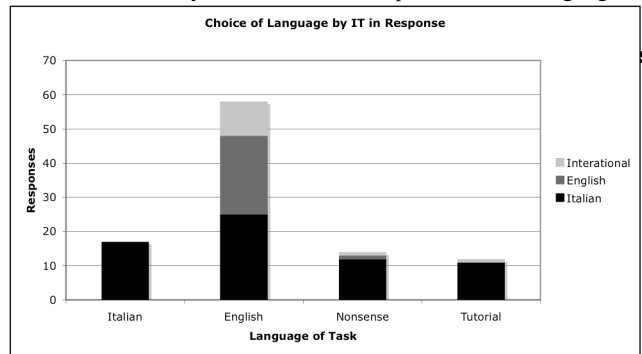
responding to a task depending on the task description. Note that tutorial tasks were language neutral (“Visit/Visita X”) and created automatically as part of the tutorial, so players can be forgiven for choosing the wrong language to respond.



**Figure 5 - Choice of Language by English players responding to Italians**

For both Italian and English players responding to a task in their own language (i.e. the task author had created the task in the other language), their responses were 100% of the time in either their own language or using internationally neutral language (Emoticons, place names, etc.). This demonstrates the success of the task owners in provoking appropriate responses from speakers of the other language.

In cases where the task author has created their task in either dual language or internationally neutral, again 100% of responses were either similarly neutral or in the responder’s own language.



**Figure 6 - Choice of Language by Italian players responding to English**

Where players were responding to tasks in the author’s native language, the choice of response was more varied. Over all of these responses, 61.27% were in their own language, with no attempt to match the language of the task author. The other 38.72% of responses were where the player made an effort, either by responding in language neutral terms or even in their non-native tongue. Interestingly, there are many examples where players seem to have used online translation engines such as *Babelfish* [14] to translate a response into the language of the task author. Italians appeared more likely to respond in English than vice versa, and the English players were more likely to use an internationally neutral response than to attempt to use Italian.

#### 3.2.3 A Picture is Worth a “Mille Parole”

A common strategy for interacting across the lingual barriers was through the use of pictures, either alone or with supporting

text. When players chose to respond to a task, they had the option of including text, a location and an image either uploaded from their computer or taken from the phone camera (on the mobile client). Only the location was required, players were free to ignore the text and image options.

Of all interactions in the game, 782 (50.61%) included an image provided by the player. Just 56 (3.62%) had just an image and no text. Italians provided images with 47.21% of their interactions, and English provided them with 53.86%.

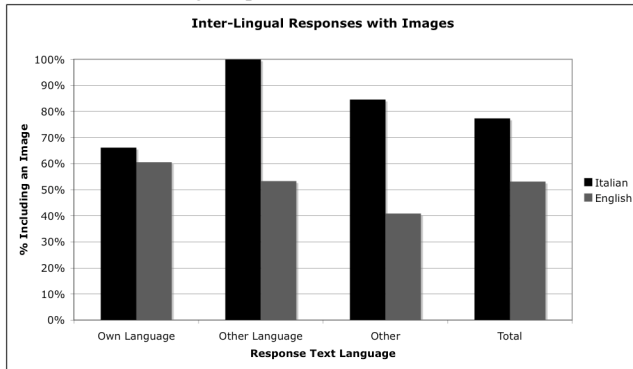


Figure 7 - Inter-language Responses with Images

Figure 7 shows how images were used when players of a given group responded to a task created in the other language, split by the classification of the accompanying text.

The use of images illustrates a strong difference in the behaviour of the two cultures. When responding in their non-native language, Italians added an image every single time, whereas the English did not provide significantly more than normal. When responding either with nonsensical or empty messages, the English provided fewer images than they would have normally, while the Italians still provided more.

In context with the behaviour over the whole game, Italians used images significantly more often when responding to tasks created by English players. Contrariwise, the English did not significantly show any different behaviour with respect to images when responding to English or Italians.

### 3.3 Cross-cultural Response by Player Classification

By analysing the classifications of players involved in cross-cultural communication, we can observe the role of play style in these interactions.

Figure 8 shows the classification of the initiators of inter-language communications split by the class of the recipient (vertically).

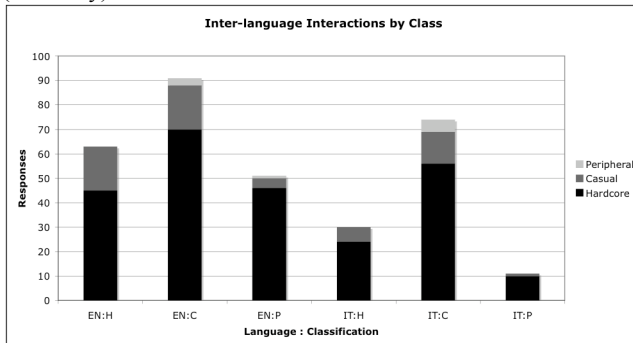


Figure 8 - Interactions by Play Style Classification

Hardcore players received 78.44% of all inter-lingual responses. This indicates that the strategies that the hardcore players used to elicit interactions from other players were extremely successful. In particular, both the English and Italian peripheral players overwhelmingly chose to interact with the hardcore players instead of the larger casual group, which illustrates the specific hardcore strategy of creating tasks that appeal to new players with limited game experience.

Interestingly, the casual players were significantly more likely to engage in inter-lingual interactions than other play styles and accounted for 51.56% of all such interactions. On average, 23.57% of interactions by casual players were to players from the other game language, compared to 10.3% for hardcore players and 12.47% for peripheral players.

## 4. CONCLUSION

Despite the relatively small number of players, the community within our social game defied expectations and used tools within the game to create a self-sustained and inclusive multi-lingual society in which they could play.

A single language did not dominate the language preference for Familiars players - 36.19% chose to use Italian and it was in common use in the game environment. Had there been a much smaller proportion of Italian language users it is questionable whether its use would have been so common. For comparison, 40 users (19%) registered from non-English or Italian speaking countries, yet the usage of these languages in the game was extremely rare with the vast majority of interactions using one of the two officially supported languages.

There is little doubt that translating an application interface into several languages stimulates the usage of those languages in the game, however multilingual application development has many issues. For example time spent in Quality Assurance and Testing explodes as the number of languages increase. One solution to this is the use of community-aided translation systems. For example, games built on the Facebook social network site can open their translation effort to the community [6], who self organise and rate translations based on quality.

The roles of the players in the community were split based on the play-style of the players. The Hardcore minority players acted as the shepherds who created an enticing environment in which the community could play, with the less active casual players providing most of the content.

### 4.1 Incentives for Interaction

In the case of Familiars, there was a strong incentive for players to interact with a wide range of other users because the players' scores were based directly on their social activities within the game. To be competitive, a rational choice for a hardcore player would be to *not* interact with other similarly ranked players, since any interaction is mutually beneficial. Instead they should find less active players (such as those in the periphery) and interact with them. Since the score increase is the same, the higher ranked player would gain a greater net score increase than they may have had otherwise.

In Familiars, where these "optimal" interaction subjects are split bilingually, it was perhaps inevitable that our players would try hard to bridge this language gap to reap the possible benefits to their scores.

However, it is not enough to simply provide such a strong incentive if the game lacks proper tools to support players in their efforts. In Familiars, the text input allowed for (sometimes poorly) translated text, but the inclusion of images as a communication

tool became very important in these interactions and became a “lingua franca” within the geographically diverse community.

## 5. ACKNOWLEDGEMENTS

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## 6. REFERENCES

- [1] Adonomics Analysis, <http://adonomics.com>, accessed March 2009
- [2] Anderson, C.: The long tail. Wired October (2004)
- [3] Barabasi, A. and Albert, R. Emergence of Scaling in Random Networks (1999), Science 286 pp 509
- [4] Bartle, R.: Hearts, clubs, diamonds, spades: Players who suit muds. <http://www.mud.co.uk/richard/hcds.htm> (1996)
- [5] Bateman, C., Boon, R.: 21st Century Game Design. Charles River Media (2006)
- [6] Facebook Community Translations, <http://www.facebook.com/translations>
- [7] Kirman, B., Lawson, S., Hardcore Classification: Identifying Play Styles in Social Games using Network Analysis, Proceedings of International Conference in Entertainment Computing, Paris (2009) In Press - Springer Lecture Notes in Computing Science
- [8] Kirman, B., Lawson, S., Rowland, D. Davide, F. Collovà F. and Puglia, S., Familiars – Manipulating Social Networks with Mobile Gaming. Proceedings of Games Design & Technology Workshop and Conference (GDTW 2008), 12-13 Nov 2008, Liverpool. ACM Press.
- [9] Martino, F., Miotto et al: Exploring social network indices as cues to augment communication and to improve social practices. In: 1st International Workshop on Maps Based Interaction in Social Networks (MapISNet '07). (2007)
- [10] Nazir, A., Raza, S., Chuah, C.N.: Unveiling facebook: a measurement study of social network based applications. In: IMC '08: Proceedings of the 8th ACM SIG-COMM conference on Internet measurement, New York, NY, USA, ACM (2008) 43–56
- [11] Taylor, T., Power gamers just want to have fun? Instrumental play in a MMOG, (2003), In proceedings of Level Up Conference, Utrecht
- [12] Timmer, J., Science gleans 60TB of behavior data from Everquest 2 logs, Ars Technica, February 15th 2009
- [13] Watts, D. J., Small Worlds – The Dynamics of Networks between Order and Randomness (1999), Princeton University Press
- [14] Yahoo! Babelfish, Available at <http://babelfish.yahoo.com/>