# Persuasive and Serious Games: Individual Reflection

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# 1 Introduction

Throughout this report, our cycling game "Urban Jungle" for the course of "Persuasive and Serious Games" spring 2012 will be explained in detail.

My part of the project was primarily two-fold - taking one of the main parts in designing the game, and programming the entirety of it. On top of that, I also took part in most of the meetings, presentations and the like, to ensure that I knew how the project was evolving and progressing. I found this to be needed, as it would have been a severe problem, had I started programming something that was not the intention.

Taking a big part in the design-process of the game, however, helped a lot in maintaining a good overview of the vision of the game, as well as coming up with a good way of handling it. It was still hard having to kill some of the great ideas that were made, while figuring the fitting scope, but those were the needed actions that had to be done to compensate for the big workload that it meant.

The report is structured to start out by describing the game, why it was made and the underlying persuasive methods therein and a more detailed look at the current prototype of the game. After that, it goes more into detail with where these inspirations came from along with the ethics of the game.

Lastly, I will take a look on the evaluation of the project, the method we used, and the results that came from it.

# 2 The Game

The initial idea for the game, was based on the fact that we find cycling in densely populated areas of Denmark (in this case, Copenhagen) to be incredibly dangerous. On top of that, it is a subject that was mentioned a lot in the news by the time of the course-start - and is regularly being brought up. With almost all of us in the group being cyclists, we found it a good idea to approach this subject and see what we could do to change people's cycling behaviors.

In terms of age-groups, the aim was the group that the largest part of the cyclists are today: students, as well as other young (teenagers and above) people. It was important to reach below the threshold for having a driver's license (18 years). Seeing as having one of those is rather impractical (at least for a student) when living in the city, it becomes more important to ensure that driving safely is taught early.

To find a fitting style for the game, we were inspired by the classic racing game "Wacky Wheels", in which different zoo-animals race each other. The cartoon-style, combined with the idea of us also using animals for our

bikers[1], we quickly settled on a nice and simple way of showing it. The real inspirations for the serious and persuasive part of the game is covered in section 3, page 7.

Rather than going for the more realistic third-person view of the cyclist, we chose to go the route of a top-down view, which in turn gave the game more a more easily distinguishable look, easier control of what to show, a limited field of view and the same sort of gameplay as various classic action arcade games had. Keeping in tune with those arcade games, also meant that the controls were very simplistic - and basically just had the exact needed things to match what you would be able to do on a bike.

## 2.1 Purpose - Why Was the Game Made?

Firstly, it is important to look closer at why the game was made, and what we specifically wanted to achieve with it. During the initial brainstorms, we figured that there were quite few games with the focus of improving people's cycling behaviors. Denmark is the perfect country to show this, as the amount of people biking is incredibly high. Furthermore, it is made all the more dangerous, when there is no actual requirement in terms of having any sort of prior training, a driver's license or anything else, which can easily cause misunderstandings between people, causing injuries and - in worst cases - actual death.

However, seeing as we really wanted this to be a proper game, we decided that it was important to empathize that the player was playing, and then let the persuasive part of it be more subtle and indirectly fed to the player in various ways. This was primarily done by not *directly* telling the player when he did something wrong, but rather save this for when the level ended. This also made the game more realistic, as it is very rarely directly told to you when you actually do something wrong in traffic - unless you are pulled over by the cops, other cyclists scream at you for it (and often it does not match what you did wrong, if anything) or you feel the pain on yourself.

The fact that most people do not know how to behave in traffic was one of the major things that made us do the game. There is too many dangerous situations that arise because people do not know how to react - further endangering other people - when they simply should not happen. We simply wanted to teach better how to respect each other, drive safely and take that extra second to avoid potential danger, rather than potentially arriving to their destination earlier.

The most important of it all, however, was that all this should be told to the player in a funny and relaxed way, so that it felt like a game.

[1] More on that later in section 3.2, page 8.

## 2.2 Persuasive, Learning - or Both?

In regards to the objectives of the game, the subject of cycling would normally suggest that a game of the "learning"-type would be the most obvious approach. However, after some discussion, we found this to be tedious and already well-shown in other more serious games[2]. Instead, we went the route of attempting to persuade the player into behaving better, by giving a glimpse of the different types of bikers, represented by the animal types.

The persuasive flow should also come from being able to see the game through a more realistic approach. As mentioned, the only direct feedback the game would give you while playing, is how the other bikers perceive your actions. As such, it does not always mean that whenever a raging biker scream at you, it is because you did something wrong, but because that person *felt* you did. It might just as well have been himself, and that he projected some anger at you because you, knowingly or not, was the cause of it.

Lastly, the post-level statistics of the game contains both persuasive and learning aspects. First and foremost, you're given a chance to rate your own performance, before being shown the statistics that the game gathered about you, as well the rating it found fitting for that. This approach allowed for the player to reflect on the choices he had just made in the play-through, while immediately afterwards being shown if he had been correct in the assumption - and also why this was the case.

As such, we really wanted the focus to be on *improving* the player's behavior. Like *Malone*[3] describes in his studies, we are going with a subtle "*intrinsic fantasy*", where you get the final results to reflect on in the end. The real payoff comes from performing well in the game, and then being told that you were correct in your assumptions, at the statistics-screen.

With that said, there is also some direct payoff in the form of the *smileys* that the other players sometimes give as response to your actions. This makes the game take use of classic behaviorism - not to teach the player, but rather hint at how he is doing. It might impact the end outcome of the game, but it does not have to. It serves purely to indicate what it is - that the player's behavior towards others is, in their eyes, either good or bad.

It is also worth mentioning the conclusions drawn by *Egenfeldt-Nielsen*[4], in his text about generations. His description of the "2nd generation" fits the mentality of our game quite well, as it builds upon the intrinsic description from *Malone*, and presenting the information in a way that is "appropriate to the this specific learner, and open up different ways of approaching the

[2]Like the games ("Safe Road Driving" and "Crucial Crew - Bike Safety") we showed at the presentation in early March.

[3]Malone (1980).

[4]Egenfeldt-Nielsen (2007).

same topic"[5].

However, that being said, the learning objectives are only in place to improve the persuasive methods, so the game is, in the end, still primarily a persuasive game, in which we wish to alter and improve the behavior and attitude of the player for the better.

## 2.3 Current Prototype

The current prototype of the game shows the basic things the game could potentially do. It has a lot of built-in ways to detect things such as proximity to other bikes, speed differences in terms of various types of collisions, showing reactions from other players and allowing these other players to behave differently. On top of that, a dynamic replacing of the opponents was implemented, so that it never felt like you were meeting the same opponents all the time. The "bell"-mechanic was also implemented to give an indication of showing that if you warned the other cyclists of you overtaking, they would probably me less likely to be surprised, and thus less likely to do something dangerous.

In the end, the currently tracked statistics quite well show what was implemented, and what was not. These could easily be combined with the passive counter that keeps track of how long you have currently progressed, to later show you where you went wrong - potentially even take a screenshot of where it went awry or the most fatal mistakes were made.

- Happy / Rage Faces
- Collisions with Other Bikes
- Fatal Curb Hits (driving too fast into one)
- Good / Bad Right Turns
- Fast Crossings

In order to further develop the game, the next logical steps would be fleshing out the various animal-types, so that they actually directly the animal they represent, and thus have different behaviors. However, this would actually mean developing a fully fletched artificial intelligence, with quite a few different parameters. Granted, this was actually what was intended from the start, but it turned out to be much more complicated and complex than intended.

Another nice addition that could add a lot of different things, would be a timer, so that it was possible to measure how long a given action (good or bad) was performed - or potentially only flag an actual if it was consistently

[5]Egentfelt-Nielsen (2007), page 274, mid-page.

bad for over a certain amount of time. Additionally, this could be used to add realistic traffic lights.

Lastly, what would really make a proper difference would be actual collisions between the bikes, to increase the level of realism. If anything, then only between the player and the opponents, and not in between the opponents themselves - however strange that might seem. The reason for this, is that this would also mean that the behaviors would need proper implementation, as well as a way for the opponents to overtake.

# 3 Design Decisions/Inspirations

While the sections regarding the game itself, and its purpose[6] is very close to the potential contents of this section, this will be more about the actual non-game inspirations, and the sources that drove us to start the project.

## 3.1 Inspirations - Shaping the Game to the Purpose

As mentioned earlier in the report, the game is based upon research done by *Anette Jerup Jørgensen* that classifies traffic users as one of four different animal types[7]. As these sources are Danish, there is a brief outline below of how each of them are classified.

- The **cheetah** is rather unique from the other animals, as it generally prefers a higher speed. It does not do it because it likes it, but simply because it feels that it can handle it. This makes the cheetah do a lot to get ahead in traffic, which can lead to aggressive behavior. That being said, this is not always the case. If too many of the other cyclists drives slower, or the traffic density is too high, the cheetah will usually conform to the general speed levels, because overtaking becomes too risky.
- The **donkey** is the one that often creates the most frustration. The reason for this, is that it insists on sticking to the traffic rules - no matter what happens around it. The donkey finds it wrong and dangerous to drive faster than allowed. As such, they often do not get along very well with the cheetahs. Penguins also tend to dislike donkeys, as they often disrupt the traffic flow.
- The **gnu** believes that it is safest to follow the traffic rules, but it is also easily pressured by the rest of the cyclists, who often drives faster than allowed, because the gnu does not want to cause any dangerous situations by driving slower and thus forcing the more aggressive road users to overtake him in any dangerous ways.

[6] See section 2, page 3 and section 2.1, page 4 respectfully.
[7] Lots of different sources can be found in the Literature list, on page 11.

- The **penguin** is the real pack animal. Where the gnu would rather primarily follow the rules, the penguin does not care about them, as it finds itself most at ease when it follows the pack. When the traffic is flowing smoothly, and there is no cheetahs or donkeys around to disturb that flow, the pack-mentality of the penguin works.

It is important to mention, that these are originally based upon car-drivers. She (Anette), however claims that it also applies to bikers, which is what we chose to go with. There are many similarities between the two categories, especially in the Copenhagen-region, because of the sheer amount of cyclists that are constantly on the road, and the importance it generally has in our society.

### 3.2 Ethics of the Game

The use of animals gave us a nice advantage in terms of ethics. Rather than translating the various types of animal into different types of people on bikes, we could simply avoid those worries altogether by using the actual animals as the bikers. This also gave another great advantage, by making our game more like a game, and much closer to the feel we already had envisioned.

The other primary side of ethics within the game, is that you do not necessarily have to drive by the law. That means, if you do something that would normally possibly give you a fine or *could* potentially harm you, nothing happens. This was done very deliberately, to further empathize that the game is about behavior in traffic, not learning how it functions. The game should still be able to track that it happened, but nothing will happen the second it does - except, perhaps, for another biker complaining about it. Exactly how it is in the real traffic.

## 4 Testing and Evaluating the Project

Evaluating a project is naturally important in figuring out the success of it, but there are many ways to go about it. By having a game that evolved about something physical outside the normal area (that is, biking), it gave some rather specific issues to deal with. How could we measure how a player's biking behavior had altered?

Some of the first thinks we looked at, was if we could evaluate during biking. We quickly discarded that option, however, as it would be difficult to do in a natural and detailed way, as well as generally be incredibly difficult to measure and compare. On top of that, the person would easily notice being observed, or already aware of it, and as such potentially change behavior because of it, which would essentially ruin the whole idea of the measurement.

There were also things which we had to make sure we recorded, as it could prove to be a great asset for the answers. First of all, if the player had a

driver's license. We felt this was very important, as it meant that the person had a guaranteed knowledge about how traffic works, what the rules were and how and why various scenarios could be dangerous - a knowledge that was not necessarily present if you did not have such. Secondly, nationality. We do have quite a bit of foreigns and exchange students present, and often their only financial solution is to get a cheap bike and transport themselves around that way. Seeing as traffic varies a lot from country to country, this could also have a noticeable impact on the results.

## 4.1 Method Used

In the end, we chose to go with a three-step questionnaire, each being filled out at different points, and each dealing with different points, as described below:

1. **Right before the game test**: General questions, and introducing the animal-types.
2. **Right after the game test**: Questions mostly dealing with the game itself, as well as checking if the player changed opinions regarding previous questions and animal-types.
3. **A few days later**: Questions to see whether or not the game had any longterm impact on the player.

We felt that this way of distributing the questions seemed like a good way of approaching it, and had some sound advantages from only using two questionnaires. If we had done that, it would have meant that the current second and third should be combined, which in turn would mean that the players would, most likely, either not have a fresh idea of the game itself and the previous questions, or not have time to drive around in traffic naturally.

## 4.2 The Results - What Did We Learn?

While discussing the results[8] with Annika towards the time of hand-in, we quite quickly figured out that the actual results of the surveys did not have much use, because of the following two main reasons:

1. **The Game State**: Seeing as the game itself is still a prototype, and lacked a some things[9] that essentially lowered the game's persuasive qualities quite a bit.
2. **Amount of Results**: Out of the total 10 participants of the first two questionnaires, it seems that only four of them replies to the third and

[8] These can also be found on the handed in CD.
[9] As described in section 2.3, page 6.

final one. This is, naturally, one of the pitfalls of using as many as three, but it was a risk that had to be taken.

While this result was a shame, we were still quite sure that this approach of evaluation was the most correct and best way of approaching the intended way of evaluation. Still, it seemed quite obvious that most of the people responding were quite consistent with their replies, and found themselves to be well aware of their choices in traffic.

# 5 Conclusions

The idea for the project was built upon a relevant and important part of the Danish society, revolving around a subject that had been in the medias for a while.

Even though the scope was lower than originally set, I think that we got the project to a point where the purpose of it - and most of its underlying features - was shown quite well, along with a good overview of what the game could potentially be able to do in a completely polished and finished state.

As such, I still firmly believe that - with enough polishing and additional features added - it could turn out to be a very exciting project that could be used to educate new bikers, as well as improving the already experienced drivers.

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