

# Towards Characters With A Dynamic Model of Social Identity

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# Towards Characters With A Dynamic Model of Social Identity

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## ABSTRACT

In this work we propose a dynamic agent-based model of social identity, named IDeA, which is capable of creating characters that have an improved ability to handle and comprehend the social context in which a game situation takes place as well as the social identities involved in that context. The model explores how a character can use identity processes that are grounded on the social sciences literature as a tool for behaviour selection and filtering. As a result, characters will choose to adopt different identities dependent on their resources and goals as well as the relevant features of the contexts in which they find themselves in. A simple demonstrator application was implemented using our model to illustrate how a character can make different decisions in the same game scenario. Using the implemented demonstrator, a study was conducted where participants observed and judged how the character behaves in different conditions regarding the context of the situation. The results obtained revealed the presence of a dominant identity among the alternatives.

## Keywords

Agent-Based Model, Social Identity, Identity Processes, Decision Making

## INTRODUCTION

In the context of games, a character which the player has no control over is referred to as a non-playable character (NPC). In many games, AI applied to NPCs has been usually centered around resolving issues regarding path finding or understanding the environment the character is in so it can use the environment to its advantage. A good example are first (or third) person shooting games, such as *Mass Effect*, where you have allies that follow you in battle. These allies are NPCs with AI which enables them to perform ideally complex

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behaviours, allowing them to follow the player's commands and movement, whilst aiding in the fight, either by shooting or providing support to the player and staying alive, by seeking cover, among other behaviours. However, when it comes to social awareness, NPCs are still severely limited. These limitations are intrinsically tied to most game's interactive narratives, which are usually constructed with a top-down approach in order to accommodate the player's actions.

With the popularization of open-world of games – games with reduced limitations in regards of exploration or progression, where the player is able to move freely in the environment with little boundaries, such as *Skyrim*, *Grand Theft Auto*, or massively online multiplayer games such as *World of Warcraft* - in particular those under the RPG (Role Playing Games) genre, developers tend to focus more in creating interesting, populated and visually rich environments to enable player interactions and thus, the narrative is usually reactive to the affordances given to the player, according to (Ryan et al. 2015).

The concern of this work is to improve the NPCs' social awareness, particularly regarding social identity aspects. To this end, we reviewed some social sciences literature on the characteristics of identity in individuals in interactions within a social context (Burke and Stets 2009, Lawler 2008, Akerlof and Kranton 2010, Jenkins 2008). These characteristics apply to situations that range from group formation/dissolution, identity change, role performance, decision making and behaviour stemming from identity. Here, we focused particularly on the processes surrounding identity driven behaviours, such as identity salience and role evaluation, and its effects in individuals. These processes were integrated in a novel agent model, called IDeA, enabling the characters driven by the agent model to handle and comprehend identity, providing context for the NPCs' behaviours. This model is intended to facilitate the creation of intelligent autonomous characters that can be used for games with a strong emphasis on human social interaction and ultimately creating emerging narratives, in turn facilitating the development of narrative driven games in regards of NPC interaction, such as open-world games, which tend to disfavor that aspect due to their larger scope.

## **THE IDEA MODEL**

The IDeA model proposes a mechanism to guide the characters' decision making that is grounded on the social identity processes that are described in the social sciences literature (Chandra and Laitin 2002). Normally in games, characters interact in virtual environments wherein social contexts are present. Similar to DIMA (Dimas et al. 2013), (Joana Dimas 2013), the IDeA model (see Figure 1) takes advantage of the characters' perceptions of its social environment as well as the characters' desired goal(s) and preconceived notions of categories of social identities (social categories).

The general idea behind the decision-making process is that the character is present in a social context defined by some relevant characteristics. The character then performs a comparison between its resources and goals and those of a known social category (present in its Knowledge Base) and calculates its fit to that social category. The salience of each social category is then calculated taking in account the fit determined earlier and the character's commitment to that social category. This process is repeated for each social category known to the character. The one which achieves a higher salience is then selected to be used as a template for the character's basic values, namely, the character's values become the ones of

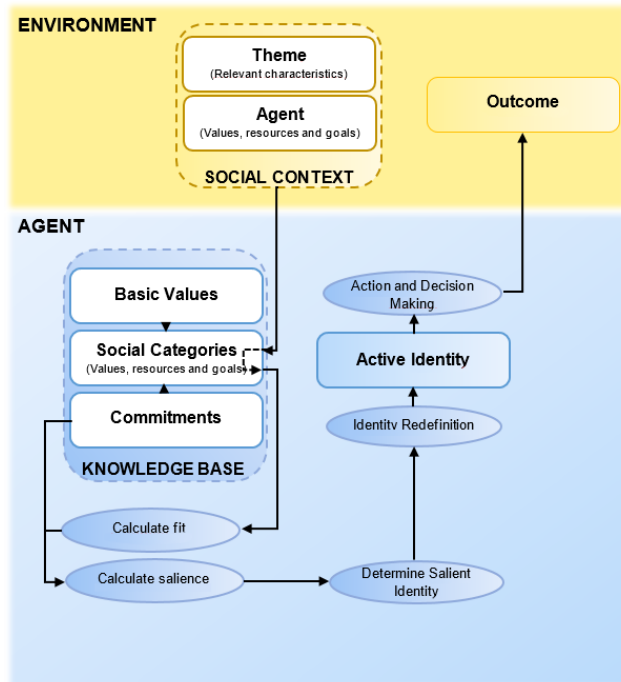


Figure 1: Diagram of the IDeA Model

the social category selected for that context, redefining the character’s social identity. For example, if in a given context a character is faced with a beggar in the streets, it will only donate money if benevolence is part of the value set for the chosen social category.

### Social Categories

Various theories of social identity agree that the process of construing one’s identity necessarily involves comparisons of similarity to others (Jenkins 2008). Moreover, the mechanism which simplifies the establishment of similarity between individuals and categories is the identification of stereotypes, in other words, compact representations of symbols and categories, encapsulating traits and behaviours expected on others (and thus in oneself).

The term *stereotype* carries a negative connotation in everyday life, as it is in most cases used to encapsulate negative or caricatured traits of people, based on race or sexuality for example. To avoid that connection, in IDeA we refer to these mechanisms of identification as Social Categories, or SC’s.

As people, we store in memory what (or who) a stereotype describes (be it correct or not), and this knowledge is updated and refined through time by social perceptions and interactions (Jenkins 2008). For the sake of simplicity, in this first version of IDeA we consider that characters have a fixed knowledge regarding SC’s.

A Social Category (SC) is formally represented as a triplet  $\langle V, R, G \rangle$  where:

- $V$  - describes a set of moral values associated to that SC (e.g., priests are benevolent and traditional);

- $R$  - is the set of resources that one connects to that SC (e.g., pirates wear eye-patches or wooden legs);
- $G$  - denotes the set of goals that are desirable by that SC (e.g., entrepreneurs want to become rich);

As social categories we consider social, professional or personal roles or groups, as exemplified above (*priest, pirate, entrepreneurs*). This concept can be extended to other, more implicit, groups such as *superstitious*, or to game-themed roles such as *archer*, or *demon* given that these groups and roles can be represented by discernible values, resources and goals.

**Basic Values.** Individuals can be characterized by the moral values they subscribe to or live by. According to (Schwartz 2012), moral values can be used to illustrate motivations behind actions, thus we can interpret that values can be seen as being part of the characterization of a social category, or in other words, we can link SCs to moral values by inferring that SC's *stereotypically* display certain moral values because on how they act and vice-versa.

In IDeA, these basic values are represented by the ten universal moral values identified by Schwartz, namely: Power, Achievement, Hedonism, Stimulation, Self-direction, Universalism, Benevolence, Tradition, Conformity and Security. An example of the Value set of a SC could be, for example  $V = \{Power, Achievement\}$ .

**Resources.** As defined by (Lawler 2008) as *Habitus*, resources can be *explicit* - noticeable or attainable things such as weapons, clothes, symbols, physical traits, which can be *seen* by other characters - or *implicit* - internal things, deduced by observation of other people (or characters) such as states of mind, ideals, norms, which for simplification, in IDeA, become explicit upon interaction, as if the character itself would disclose them. An example of a Resource set of a SC could be, for example  $R = \{Glasses, Green, Shirt\}$ .

**Goals.** Another component which helps define a SC is the goals that are usually associated with it. These can be interpreted as the SCs' norms or ideals to which individuals establish comparison (Lawler 2008), (Akerlof and Kranton 2010), (Burke and Stets 2009), (Jenkins 2008). An example of a Goal set of a SC could be, for example  $G = \{Being - a - good - person\}$  (Note: a SC does not necessarily need to have any defined goals).

**Commitment.** Even though the character comprehends the existence of a given group or role, it does not mean that it want to become part of that group or play that role in a given context. Thus, commitment is represented as  $c_{SC_i}$  (the character's commitment to the SC with an ID  $i$ ) and is a value which ranges from -1 (representing a displeasing affinity) to 1 (representing a complete affinity). An example of the representation of a commitment to a SC could be  $c_{SC_{Dancer}} = -0.31$  if the character considers itself with two left feet, or  $c_{SC_{Dancer}} = 0.43$  if the character considers itself a moderate dancer.

## Social Context

In IDeA, the simulated environments are connected to social contexts. These social contexts serve as means to relate to the character what features are relevant in the environment (and inherently the social context(s)) the character finds itself in. The relevant features are taken in account to perform the process of *identification* (Jenkins 2008), where the character establishes degrees of similarity and difference between how it seems itself, what is expected in the social context the character is in and the social categories that the character is aware of.

**Features.** In IDeA, social contexts are characterized by features which contain what is relevant to that context in the domain of that simulation, namely, resources and affordable goals that appertain to that context. An example can be seen in table 1.

Context	Context Relevant Resources	Goal Affordance
$Ctx_i$	$\{resource_1, resource_2, \dots\}$	$\{goal_1, goal_2, \dots\}$

Table 1: Structure of a context

To determine any similarity, the contexts are used to determine the character’s adequacy to its known social categories in the situation it is inserted, on other words the social categorical adequacy is determined by how many of the character’s features are also present in the relevant features of a social category and are relevant to the situation (context) at hand.

The context is also used for the character to perceive whether the situation enables the fulfillment (or *affordance*) of the goals of each known social category. This factor is intended as means to boost the priming to the adequate social category.

These two factors (*adequacy* to the relevant resources and *goal affordance*) are used to define the character’s fit for it’s known SC’s.

**Salience.** This value represents how suitable a SC is to be chosen by taking in account the characteristics of both the character and the social context. In order to determine the salience of a social category in a given context -  $salience_{\langle SC_i, Ctx_j \rangle}$  - we take in account the character’s **fit** to that social category in that social context -  $fit_{\langle SC_i, Ctx_j \rangle}$  - and the character’s (predetermined) **commitment** to the social category in question -  $c_{SC_i}$ . As such we propose to the use of equation 1, define as:

$$salience_{\langle SC_i, Ctx_j \rangle} = fit_{\langle SC_i, Ctx_j \rangle} + c_{SC_i} \quad (1)$$

These calculations are applied to all other social categories present in the character’s knowledge base. That is to say that if there are, for example,  $n$  Social Categories in the character’s knowledge base this calculation will be performed  $n$  times. The Social Category which achieves the highest salience score is then selected as the character’s archetype in terms of moral values which, in turn, can be used as basis for the character’s decisions.

**Fit.** The character’s **fit** determines how much the character’s defining characteristics are in accordance to those of a given Social Category while in a Social Context. As stated before, the character’s fit is composed of two components:

- The character’s *adequacy* to a SC in the context. This adequacy is determined by how many of the character’s resources are relevant to the context and are considered to be characteristic of that SC. In other words, for each of the character’s resource that matches simultaneously the context relevant resources and the SC’s resources a score of 1 is added to the *adequacy*.

For example, let us say that the character wears a plaid shirt and he knows both *fishermen* and *lumberjacks* usually wear plaid shirts. If the context were to be, for example, a lumber yard (where its usual to find lumberjacks wearing plaid shirts), then the character would be adequate to the SC of *lumberjack*, but not of *fisherman* even though they also wear plaid shirts.

- The *affordance* of the context regarding the character’s desired goals. This is determined using the same principle as the adequacy, except instead of looking at the character’s resources we look at its desired goals. In other words, how many of the character’s goals are affordable by the context and are considered to be desirable by that SC. Thus for each of the character’s goals that matches simultaneously the context’s and the SC’s affordable goals a score of 1 is added to the *affordance*.

For example, let us assume that the character has the goal of cutting down trees and he knows that *lumberjacks* cut down trees. The context of a forest, for example, is able to encompass that goal. So, if present in a forest context, the character’s goal is *affordable*.

Thus, we propose the fit -  $fit_{\langle SC_i, Ctx_j \rangle}$  - to be calculated by averaging these two components, as it can be seen in equation 2.

$$fit_{\langle SC_i, Ctx_j \rangle} = \frac{adequacy_{\langle SC_i, Ctx_j \rangle} + affordance_{\langle SC_i, Ctx_j \rangle}}{2} \quad (2)$$

Having these two components enables a more accurate priming, in the sense that the character might *feel* adequate to some SC in that social context, but its goals not be afforded, and vice-versa - being able to fulfil its goals but not feeling adequate to any SC that affords that goal in that context, resulting in a lower score, or both components are valued, meaning the character feels adequate and his goals are afforded by some SC in the context, resulting in a higher score.

## IDEA DEMONSTRATOR

The IDeA demonstrator is the application where we evaluated our model. The demonstrator consists on a text-only storybook where we use our model to manipulate the ending of the story according to the character’s identity salience and social context.

The scenario in the story revolves around the inhabitants (and visitants) of Niceville, a town where it's expected to be nice and to help anyone in need, thus the people who live there behave in conformity to what is expected of them: to be nice. This attracts, of course, people who intend to take advantage of the nice people of Niceville, and so, thieves prey on the streets.

To stop this ongoing trend, the King of Niceville placed guards on the streets, and the citizens, upset with the current situation were willing to fight to uphold the values of which Niceville is so proud of.

Our character represents a proud citizen of Niceville (having a commitment to "citizen" = 1) turned proud member of the King's Royal Guard (commitment to "Royal Guard" = 0.8) however, today is his hard earned day off. So used to carry around his guard gear every day, he instinctively left home with his sword.

In his free time he enjoys to fight in the city's underground fight clubs and is considered a good fighter (commitment to "fighter" = 0.5). His tattoos instill some unease on some newer fighters. His passion for fighting, both recreationally and while on the job, has graced him a few scars here and there.

With this scenario we intend to represent the agent's interaction with NPC's in a street social context. Our agent, a Royal Guard, is enjoying his day off and decides to go for a walk around Niceville.

The situation is divided in two events: the first highlights some of the agents' resources which will in turn prime the salience of a social identity and the second event probes the agent for a decision. In this scenario, while the first event varies between three sub-cases, the second event is always the same, namely to determine if the agent is charitable toward a homeless NPC. We present three sub-cases to this scenario, where in each case the relevant features to the social context will vary.

The sub-cases of this scenario are defined as follows:

- Sub Case 1.1 – Uneventful day -  $Ctx_{\emptyset}$
- Sub Case 1.2 – A thief lurking in the streets -  $Ctx_{\{Fight\}}$
- Sub Case 1.3 – A wall of trophies and a fight -  $Ctx_{\{Fight,Trophy\}}$

In this scenario, the agent starts each sub-case defined as such:

Attribute	Values
Resources	{Weapon Use, Battle Scars, Tattoos}
Goals	{Enjoy Day Off, Acquire Trophies}

Table 2: Agent's parameters



Attribute	$SC_{Fighter}$	$SC_{RoyalGuard}$	$SC_{Citizen}$
Values	Power, Achievement	Security, Benevolence	Conformity, Benevolence
Resources	Weapon Use	Weapon Use	Lives in Niceville
Goals	Acquire Trophies	Keeping Peace	Being Nice

Table 3: Agent’s known Social Categories

	Fighter	Royal Guard	Citizen
$c_{SC_i}$	0.5	0.8	1

Table 4: Agent’s Commitment ( $c_{SC_i}$ ) to the SC’s

These values apply and are the starting points to all sub-cases. While the definition of each social category remains unchanged throughout each sub-case, the agents’ values, resources and goals are mutable, much like how it happens in ourselves depending on many things, which include mainly social situations or contexts.

### *Sub-case 1.1 – Uneventful day – $Ctx_{\{\}}$*

In this sub-case, the agent is taking a stroll through the streets of Niceville, and encounters a homeless person and as such, no relevant contextual characteristics are identified. Before being a guard, the agent is a model citizen of Niceville (commitment to the SC of citizen is 1) which leads him to give the homeless some coins. In this sub-case the context is defined as such:

Context	Context Relevant Resources	Goal Affordance
$Ctx_{\{\}}$	$\{\}$	$\{\}$

Table 5: Context definition for sub-case 1.1

By there not being any relevant contextual resources, nor it enabling the achievement of any goals, no social category fit can be determined (every fit calculations equate to 0) and no goal is fulfilled (all goal calculations equate to 0), as such, the agent is guided solely by its commitments to each Social Category. Thus, by equation 1 we can determine the salience to each of the SC present in this sub-case (see table 6), in light of its context (which in this sub-case is empty):

	$SC_{Fighter}$	$SC_{RoyalGuard}$	$SC_{Citizen}$
$Adequacy_{\langle SC_i, Ctx_{\{\}} \rangle}$	0	0	0
$Affordance_{\langle SC_i, Ctx_{\{\}} \rangle}$	0	0	0
$Fit_{\langle SC_i, Ctx_{\{\}} \rangle}$	$\frac{(0+0)}{2} = 0$	$\frac{(0+0)}{2} = 0$	$\frac{(0+0)}{2} = 0$
$Salience_{\langle SC_i, Ctx_{\{\}} \rangle}$	$(0 + 0.5) = 0.5$	$(0 + 0.8) = 0.8$	$(0 + 1) = 1$

Table 6: Salience calculations of first story alternative

The SC that is most adequate to the situation is  $SC_3$  – Citizen, and so the agent acquires

the values of Benevolence e Conformity. Being currently in a benevolent mood, and in conformity to the town’s morals of niceness, the agent gifts the homeless with some coin.

**Sub-case 2 – A thief Lurking in the streets -  $Ctx_{Fight}$**

In this sub-case, the agent is enjoying his day off on the streets of Niceville and he notices two things, a homeless man and a thief sneaking about and stealing from unaware villagers. Faced with this situation, the agent loses his nice demeanour, becoming quite aggravated and grabs his sword. This instils in the agent the desire (or goal) to uphold his duty as a guard and maintain the peace in the streets. The agents Goal set changes to:

- Agent’s Goals: {Enjoy day off, Keeping Peace}

In this sub-case the context is defined as such:

Context	Context Relevant Resources	Goal Affordance
$Ctx_{Fight}$	{Weapon Use, Magic Use}	{Score Settling, Keeping Peace}

Table 7: Context definition for sub-case 1.2

The fighting contextual characteristic prompts the agent to unsheathe his sword and maintain peace in the streets, and thus, by equation 1 it is possible to calculate the salience to each of the SC present in this sub-case, in light of its context.

	$SC_{Fighter}$	$SC_{RoyalGuard}$	$SC_{Citizen}$
$Adequacy_{\langle SC_i, Ctx_{Fight} \rangle}$	1	1	0
$Affordance_{\langle SC_i, Ctx_{Fight} \rangle}$	0	0	0
$Fit_{\langle SC_i, Ctx_{Fight} \rangle}$	$\frac{(1+0)}{2} = 0.5$	$\frac{(1+0)}{2} = 0.5$	$\frac{(0+0)}{2} = 0$
$Salience_{\langle SC_i, Ctx_{Fight} \rangle}$	$(0.5 + 0.5) = 1$	$(0.5 + 0.8) = 1.3$	$(0 + 1) = 1$

Table 8: Salience calculations of second story alternative

Thus, the SC that is most adequate to the situation is  $SC_2$  – Royal Guard, and so the agent acquires the values of Security and Benevolence. As such, to fulfil his duties as a guard, encountering the thief compels the agent to bring him to justice, upholding the safety of Niceville and as a Guard of Niceville, the agent is benevolent and so approaches the homeless person and donates some money.

**Sub-case 3 – A wall of trophies and a fight -  $Ctx_{Fight, Trophy}$**

In this sub case, the agent, is presented two contextual queues: on one hand, he notices a thief lurking in the shadows who has stolen a homeless man’s money, which prompts the agent to lose his niceness and get his weapon; on the other hand he notices a trophy display, which reminds him of his fighting passion and makes him want to fight. In this sub-case the context is defined as such:

The trophy display in the agents field of view reminds him of his passion for earning trophies in the town’s underground fighting clubs, and as such, he interprets this as an opportunity to earn one more. Thus, the agents Goal set changes to:

Context	Context Relevant Resources	Goal Affordance
$Ctx_{Fight, Trophy}$	{Weapon Use, Magic Use}	{Score Settling, Keeping Peace, Acquiring Trophies}

Table 9: Context definition for sub-case 1.3

	$SC_{Fighter}$	$SC_{RoyalGuard}$	$SC_{Citizen}$
$Adequacy_{\langle SC_i, Ctx_{Fight, Trophy} \rangle}$	1	1	0
$Affordance_{\langle SC_i, Ctx_{Fight, Trophy} \rangle}$	1	0	0
$Fit_{\langle SC_i, Ctx_{Fight, Trophy} \rangle}$	$\frac{(1+1)}{2} = 1$	$\frac{(1+0)}{2} = 0.5$	$\frac{(0+0)}{2} = 0$
$Saliency_{\langle SC_i, Ctx_{Fight, Trophy} \rangle}$	$(1 + 0.5) = 1.5$	$(0.5 + 0.8) = 1.3$	$(0 + 1) = 1$

Table 10: Saliency calculations of third story alternative

- Agent’s Goals: {Enjoy day off, Acquiring Trophies}

By equation 1 it is possible to calculate the saliency to each of the SC present in this sub-case, in light of its context. Thus, the chosen SC is  $SC_1$  – Fighter, and so the agent acquires the values of Power and Achievement. As an amateur fighter, the agent’s resulting fighting spirit leads him to pick a fight with the thief and when he encounters the homeless while in a fighting mood, the agent possesses no desire to donate money, on the account of not feeling benevolent.

## EVALUATION

Using the scenario just described, a user study was conducted to assess how players would interpret the choices made by the protagonist in the different contexts. The experiment consisted of a between-groups evaluation with participants being randomly assigned to one of four possible conditions (see Table 11). After seeing the story, participants fill an online questionnaire containing questions about the appropriateness of the decision made by the character as well as the social roles that motivated such decision.

### Groups

The groups are characterized by the aspects detailed in table 11.

Group	Condition	Context	Salient Identity	Decision
1	De-contextualized	Empty	Citizen	Donate
2	Contextualized	Fight	Guard	Donate
3	Contextualized	Fight + Trophies	Fighter	Don’t Donate
4	De-contextualized	Fight + Trophies	Citizen	Donate

Table 11: Experiment group characterization

The test conditions that the experiment participants were asked to try are described as follows:

### *Contextualized Conditions*

The contextualized conditions (Group 2 and 3) represent how the character Ace should behave when using our identity model by rooting its decision making process and subsequent behaviour in its identity, which in turn is connected to the social context of the situation. In Group 2, the decision is to donate money, given the priming of the Guard identity, and in Group 3, the decision made by the model is to not donate money as a result of the Fighter identity being selected.

### *De-Contextualized Conditions*

In these two conditions (Group 1 and Group 4) the contextual component was not used to inform the decision of Ace. In the case of Group 1 there were no relevant contextual features so the character's behaviour is derived solely from the SC that has the highest commitment (Citizen in this case). In the case of Group 4, the character decides to perform the opposite decision of the IDeA model in the presence of the same contextual features.

### **Results**

A total of 84 people (59 males and 25 females, with ages comprehended between 19 and 66) participated on our experiment, being that of the 84 people, 21 were part of group 1, 21 were part of group 2, 22 of group 3 and 20 of group 4.

### *Appropriateness*

Figure 2 shows the results obtained for the multiple-choice question about the appropriateness of Ace's decision to donate or not donate money to the beggar at the end.

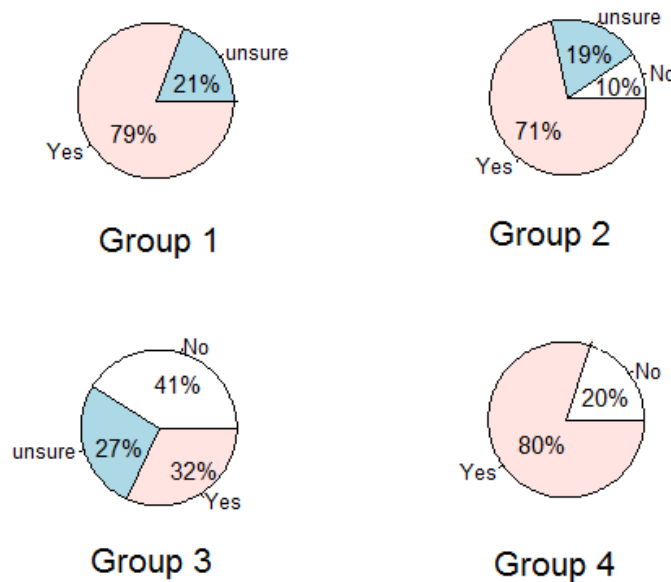


Figure 2: ‘Do you think that Ace’s decision was appropriate?’

We can see that in Groups 1, 2 and 4, the opinion is consensual and the results are not that different, while Group 3 produced a somewhat different result.

For Group 1, the results were within our assumptions. Since this was considered our baseline group, we can see that Group 2, which read a response given by the model, felt generally the same way as this group, which read a predetermined ending. For Group 3, however, even though the proportions are similar, the “No” slice is evidently larger comparing with the other slices of that graph and even comparing with “No” slices from other graphs. This is an unexpected result as in this case the contextual hints in the story were evidencing an identity that was not benevolent enough to donate money however people found that the action of not giving money was inappropriate given the situation.

For Group 4, the results are very similar to those of Group 1, given that both these groups are from the de-contextualized condition. However, the textual hints regarding the context features (even though turned off in the model) were very distinct, which, along with the responses from Group 3, leads us to believe that participants are disregarding the contextual features.

**Social Role**

Figure 3 shows the results obtained for the multiple-choice question about the social role that led to Ace’s decision. The results follow the same exact pattern as of the previous question, having Groups 1, 2 and 4 produce very similar results and Group 3 standing out.

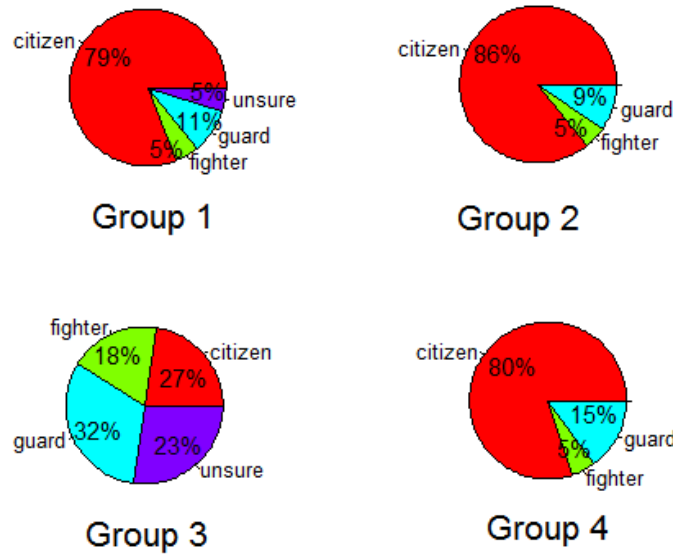


Figure 3: “Which of these roles would you attribute the character’s reasoning to?”

Overall we can determine that participants chose the social category of “citizen”. It is possible that, although we present several other features of identity for the character, people gave more importance to the fact that the character was from Niceville, acting in Niceville, and thus it is their duty being nice. It is plausible that participants are disregarding the context in favour of identity and when the decision goes against that of being a model citizen of Niceville (Group 3), the participants were confused and divided between the possible answers.

## Motivation

Figure 4 depicts what people chose as the main driving factor behind Ace's decision and once more the answers follow the same pattern as the two previous questions.

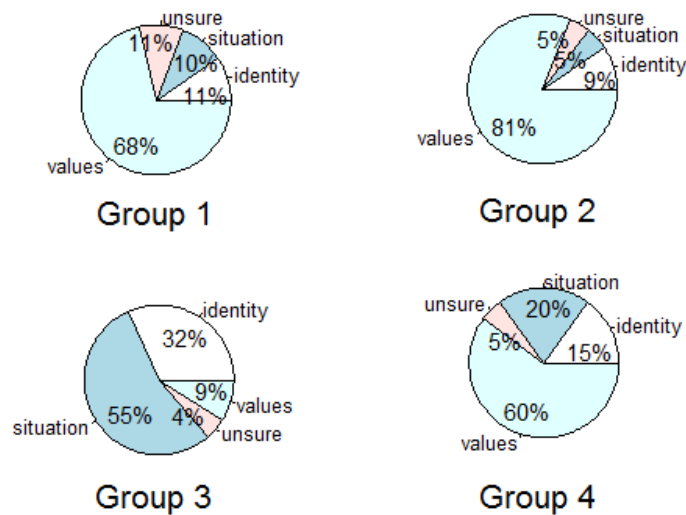


Figure 4: “Of the following, tells us which ones you feel had impact in the decision made by Ace when he encounters the beggar.”

Possibly, people were focused on the fact that the character was nice and since he gave money he followed his morals. In the situation where he did not give money (Group 3) people attributed the situation (or context) for his behaviour. In a sense this is a good result, high indicates that context is powerful enough to steer behaviour but also, together with the previous answers, indicates that the readers might have been biased by the story regarding the importance of being nice.

In general, the results obtained suggest that the story's description of Niceville heavily induced participants perception on the identities described in the story, and since the decision of all stories (except group 3) ended in the donation of money, we feel that participants directly attributed that to the character acting as a citizen, disregarding the context.

## CONCLUSION

In this work we investigated how a model of social identity, grounded on the social sciences literature, can be used to drive the decisions made by game characters in social environments. To illustrate how the model works, we described a simple scenario where a character makes a decision to donate or not donate money to a beggar according to the social identity that is more salient in that moment. A user study was conducted to assess how participants would judge the decision made by the character when it adopts different identities as a response to changes in the context of the situation. The results obtained indicate that, despite the manipulation of the context in the story, users did not significantly change the perception of the social identity that was driving the decision made by the character. Instead, the

majority of participants selected the same social category in most conditions to explain the character's behavior and they perceived the character to be inappropriate only when its decision was contrary to this social category. Given that the predominantly selected category was the first one to be introduced in the story it is possible that participants gave it a stronger importance compared to the other categories that were only introduced later. In other words, there is possibly an order effect that we would need to consider in a follow-up evaluation. Also, whereas two of the categories (fighter, guard) are associated to specific occupations, the most selected one (citizen) has a broader range and this might have also biased people's opinions. As future work, we would like to greatly improve the scenario by increasing the number of decisions the character is required to make and the number of possible categories that the model can apply. This will allow players to have a more informed opinion about the characters' behaviour. Also, we would like to explore scenarios with contexts that are more dynamic that can be altered midway through an interaction by characters, the environment or the application itself. Finally, an addition to the calculation of the salience of identities could be the attribution of weights to features, in the sense that some features could have more importance than others.

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