

Puppet

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First Report on Evaluation of PUPPET system
Work Package One – Achieving Expressivity
June, July, August, 2001

This constitutes the report from the evaluation of the latest version of the PUPPET system received in COGS on 21st June, 2001. This system is designed for the first of three work packages, which is specifically concerned with trying to achieve expressivity. The term ‘expressivity’ encompasses decisions about (1) how the characters look, (2) how the characters behave, and, (3) how that behaviour is best expressed for our intended users – young children age between 4 and 8 years. This involved extending the capabilities of the previous version of the system within the context of an improvisational scenario by incorporating new animations and sounds, optimising the timing and responsivity with a reduced number of characters. The testing criteria reported here therefore focus on the system in terms of young children’s perceptions – their level of engagement; their understanding of the scenario, and, what inferences they make about the behaviour and expression of the characters in situ. The team who conducted the evaluation included members from COGS (Pat George, Yvonne Hindle, Paul Marshall, Mike Scaife and Yvonne Rogers).

Taken overall, we should be pleased with the positive reception to the system and to the demonstration that it can fulfil its potential for ESE objectives. There is still a little way to go to promote more instant readability of the projects of the characters but, given the suggestions outlined in the Summary, seems to be achievable.

1.0 Introduction: the system

The current system set up used a dual processor PC that runs the agent behaviour engine and an SGI 250Mhz O2 that runs the visual environment and low-level agent Modules. The version of the PUPPET system tested in this evaluation is the latest version of the Virtual Puppet Theatre, aimed at children between ages 4 and 8 years. There is some degree of further development scheduled, particularly in terms of instantiating 'on-line' interactivity (Work Package 2), and 'off-line' interactivity (Work Package 3).

(REFERENCE: see COGS 010606, LIA-010705).

The Scenario

Following the first PUPPET Research Atelier in Aalborg from 30th April to 4th May, 2001, it was decided to implement an improvisational scenario in which there are only two virtual actors: a Farmer and a Cow: the Farmer and the Cow are intended to have different goals and aims, and behaviours. Overall, the Farmer loves order (and has an 'animal' personality trying to get out), the Cow really wants to be more 'human-like'. The Cow initially is inside his fence trying to escape, whereas the Farmer is continually looking around the farmyard to see if all is well. While the Farmer is always trying to create order on his farm, the Cow is constantly trying to run away thus challenging the (will and) order that the Farmer is trying to create.

The two virtual actors (agents) can change their status and their behaviour, which reflect a different way of being in the world. Their status determines how dominant or submissive they are in the interaction (high or low respectively), and the behaviour (positive or negative) is meant to characterise the two major strategies that each agent uses to try to achieve its goal (in particular, luring versus herding for the Farmer, and avoiding versus confronting for the Cow). Thus, for each agent, there are four combinations of status and behaviour available for the various encounters of Farmer and Cow, noted below.

	Farmer		Cow	
	Negative Behaviour	Positive Behaviour	Negative Behaviour	Positive Behaviour
High-Status	H -	H +	H -	H +
Low-Status	L -	L +	L -	L +

The animations used in the current version of the system are aimed at : (1) the expression of personality; (2) the expression of the different combinations of status and behaviour available for the characters , as above, and also, (3) the various encounters of the Farmer and the Cow.

The overall goal of the scenario is to provide a storyline that is interesting: the storyline itself is intended to have a cyclical quality, which means it can be repeated with variations.

2.0 The aims of evaluation

There are a number of aims for this evaluation:

- To determine children's level of engagement with the scenario – whether they find it interesting and notice its cyclical quality
- To investigate children's perceptions and understanding of the scenario in terms of the intended display – the aims and goals of the two characters, and the different types of interactions at different points in time (for example, depending upon status and behaviour)
- To feedback data from testing to the development team in order to refine the final two work packages

3.0 The methodology

We decided that the best way to test was to see children at the older age range appropriate for PUPPET at a local school. This was to:

- Embed the activity within a normal school day
- By using older children, we will obtain detailed feedback
- Obtain data from as many children as possible
- See children in groups, to give each child the opportunity to participate in, and share in, the comments of others

As this work package is primarily concerned with expressivity and engagement (rather than the child interacting as avatar), we decided that the most efficient way to evaluate it was to constrain the interaction by focussing directly on the children's impressions. The main strategy was for an adult to be the 'intelligent camera', which kept both characters in view, thus optimising the children's opportunity to always see (and hear) what both characters were up to and of course, the interaction between characters.

However, since an essential factor here is how engaged the children are with the system, it is important to establish how much support or scaffolding is required. This is central when trying to determine how much children can pick up from watching the scenario. Another complex and difficult question is how to distinguish between competence (children's understanding of the scenario and characters) and performance (the expression of that understanding). Given these factors we need to be particularly sensitive to the children's reactions, and therefore flexible with respect to what we ask children to do and how we structure the sessions. Overall, care was taken to try to maximise the impact of the scenario for the children, and also to facilitate an atmosphere where children felt most comfortable expressing their views. Thus, we adapted the methodology as and when appropriate – see below for a summary of conditions.

Condition 1: watched scenario uninterrupted.
wrote about story individually
group discussion including standardised questions

Condition 2: watch scenario uninterrupted
produced a story-board of story individually
group discussion including standardised questions

Condition 3: watched scenario interrupted by adult at salient moments
told story to adult
group discussion including standardised questions

Condition 4: watch scenario uninterrupted
watched scenario again, this time interrupted by adult at salient moments
told story to adult
group discussion including standardised questions

Although there were four different conditions, all children watched the scenario usually with five peers. After this they gave feedback on their impressions of the characters and the scenario, although in different ways. Finally, all children participating in a question and answer session either individually, or in conjunction with a group discussion.

How the Scenario was introduced to the Children

We introduced the system to the children in a small group, by telling them that we were going to show them cartoon-like characters on a computer, and that we were really interested to know what they thought

about them. We told them that we would like their help because we wanted to develop a computer program that young children would want to play with, by perhaps pretending to be one of the characters.

Watching the Scenario

After introducing the task to the children, they viewed the scenario always from the beginning, in small groups. The spontaneous comments and questions that the children voiced were noted throughout.

For some of the children (conditions 3 and 4), we stopped the scenario at various points to ask specific questions, usually about what they thought was happening at that point. In one sense it was very difficult to be prescriptive here since we did not know in advance how the characters were going to behave. However, we tried to key in on salient points throughout the scenario and these points and as noted above, all the responses were recorded.

Determining their overall impression of the Scenario

After watching the scenario, we asked children to participate in a task that was aimed at determining their overall impressions of the scenario. Several different methodologies were used for this. Each is detailed below:

- **Writing the Story**

After viewing the scenario, we ask some of the children to write the story (with as much support as required). Here we made a point of emphasising that it was not their writing skills that were being judged but that we really wanted to know what they thought was going on and their ideas about the story. We tried throughout to encourage the children to write about what they thought was going on. We used the prompt: “for example, what do you think happened in the beginning, the middle and the end?”

- **Drawing the Story (producing a comic-strip)**

We asked some of the children to draw the story. A first step involved the child deciding how many segments they thought made up the story. The paper was then segmented into these by an Adult. The children were then encouraged to fill in each segment by either using the skeleton type figures provided, or by drawing their own – whatever they felt was best. We discouraged children from drawing ‘masterpieces’, but encouraged them to include things like objects, props, facial expressions etc. After completing their story-board, we asked them to come up with a title, and if possible, to write anything appropriate about each segment. For example if the children used speech bubbles, they were encouraged to fill in what was being said.

- **Tell the Story**

After viewing the scenario, we asked some of the children to tell their story (either individually or in pairs) to an adult. As above, we tried throughout to encourage the children to tell us about what they thought was happening in the scenario. If required, we used the prompt: “what do you think happened in the beginning, the middle and the end?”

Question and Answer session

We included a question and answer session to address specific issues of expressivity. For those who participated in this task in a group, this was the main focus of the group discussion at the end of each session. Although the specific questions are noted below, we also noted any spontaneous questions or comments that the children made during this task and throughout the session.

- **Aimed at capturing visual perception:**

What did you like/dislike about the Farmer?

What did you like/dislike about the Cow?

- **Aimed at capturing information about the interaction between the characters:**

Do you think that the Farmer liked the Cow?

Do you think that the Cow like the Farmer?

- **Aimed at capturing information about the motives/goals of the characters:**

What do you think that the Farmer was trying to do?

What do you think that the Cow was trying to do?

- **Aimed at capturing salient objects and the characters movements/desires:**

What objects did you notice?

What objects (if any) do you think that the Farmer liked?

What objects (if any) do you think that the Cow liked?

- **Aimed at getting at what they thought of the story (the scenario):**

Using this scale (5 point likert scale), how good do you think the story was?

- **Aimed directly at advice:**

Do you think that younger children (aged 4 to 6 years) would find it interesting?

How could we make it better?

Recording of Information

The drawings and written stories that the children produced were kept. Two adults recorded all spontaneous comments and responses to specific questions. All of this data has been used for analysis.

Post-session

After each session, the team met as a whole to immediately review what had happened in the session and to decide on any changes to procedures. All data was collected and detailed.

4.0 Details of children

All sessions were carried out in two large rooms at Mile Oak Primary School, which is local to Sussex University. Parental consent was obtained for all children who participated in the study. In total 51 children were seen – twenty-one girls and thirty boys. The mean age of all the children was 8 years 2 months (s.d. for boys and girls was 4 months). The youngest child was 6 years 11 months and the oldest was 8 years 9 months.

The children were seen initially in small groups, although for different tasks and/or depending upon circumstances, some of the children were seen individually or in pairs.

5.0 The children's reactions

The responses of the children may be usefully grouped together in terms of the categories described below: perception of narrative; perceptions of the characters and interactions between characters. This is a convenience for the most part because the children gave responses at different points in time, while doing different activities.

5.1 Perception of Narrative

One strategy used in this evaluation was to ask children to produce a narrative so that we might be able to get a sense of the overall meaning that they placed upon the scenario. In short, this task was aimed at capturing the overall impression created – how the children make sense of the character actions and behaviours in context. As noted in the methodology, we not only used different methods for this (e.g.

writing, drawing and telling), but the children's experience prior to producing the narrative changed over the course of the evaluation. These factors are presented in temporal sequence with reference to the medium used.

Writing a Story:

As noted above, after viewing the scenario, we asked several children to write a story about what they had seen. Although we tried to scaffold this task for the children, some children found it difficult, even with prompting and support. A selection of the stories are presented below ¹

" I think it will good for littler children "

" I liked the cartoon very much. I saw a cow, farmer, hay and a bookshelf. You could put something different when the cow moos and turns "

" I saw a cow, tree's framer, haystack, fence, parth, tractor, books, shelf, bench, music thing, siracle in the middle, grass, rocks, stones, cartoon "

" It started well and I like the mooing from the cow. Could you go ontoo other things instead of repaeting it. I think young children will like it "

" We saw a farmer a cow and a Music player and the cow always danced at the Music, the farmer followed the cow. The farmer looked like a builder. I liked it a lot. "

" They started of making noises and then the cow started walking around then so did the farmer. The kept on walking round the farm then when they stopped at something the cow started singing. "

" The caricters keepped doing the same things. And I liked the film. I like the cow. The nosis I tholt were funny and silly. I did not understand the farmer. "

" The carichters were good and I liked the noyses. To make it better the cow cud nock the man over. It was really intrasing. And I liked the way they moved. "

" Carictor. Farmer, cow. Start: the ?? Middle: ?? End: ?? "

" I like it when the cow came out of the shed. When the cow came out it had a funny flower in his mouth. "

" I like the bit were "

" At the first bit I like when the cow capted getting out of a place were he has to be. I like when the cow was singing with the instrument. "

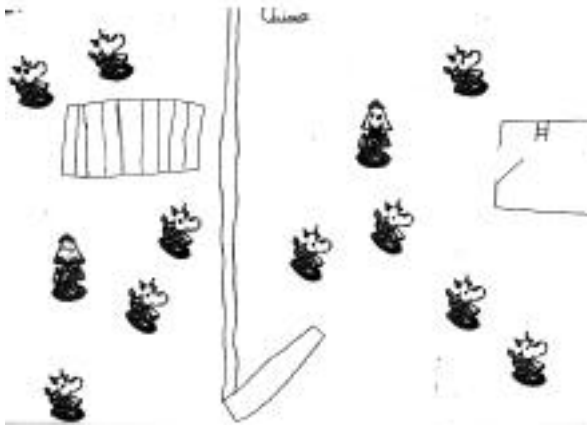
¹ *These stories are reported here verbatim (without correction)*

As can be seen, the stories were rather short – the number of words used ranged between 5 and 34, with an average of 23 words. When the stories are categorised in a simple fashion by what they conveyed (nothing, very simple, descriptive event sequence, or with some inferences about character behaviour). A large proportion of these stories conveyed nothing (33%), with the majority being rather short and simple, tending to report few events (58%). Only 12% of stories conveyed a little more detail.

Drawing a Story:

A second method used was for the children to draw a story-board (like a cartoon strip) of what they had seen. An important point to note is that the children really enjoyed this task – they were very happy and engaged throughout this task. A sample of these drawing and their titles are presented below.

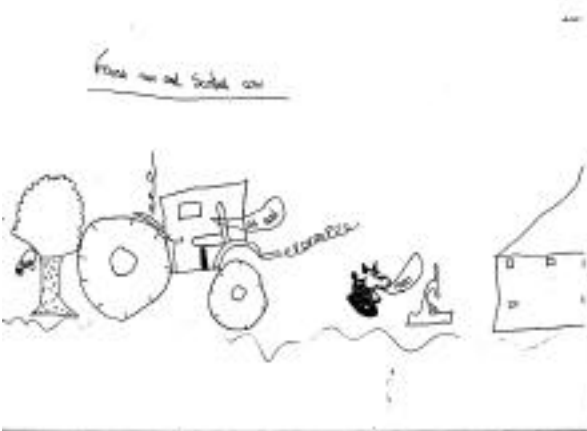
“Chinese”



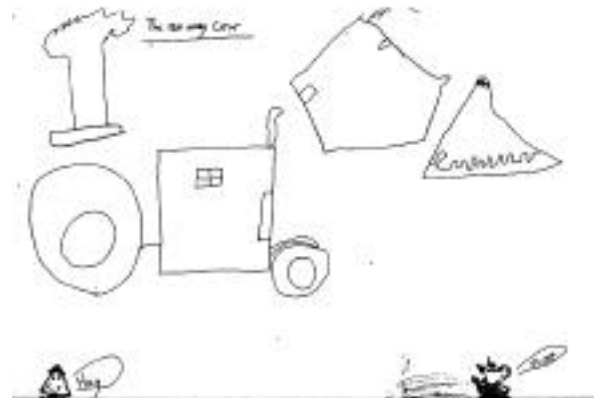
“The Chinese man and the Francs cow”



“Frensh man and Scotish cow”



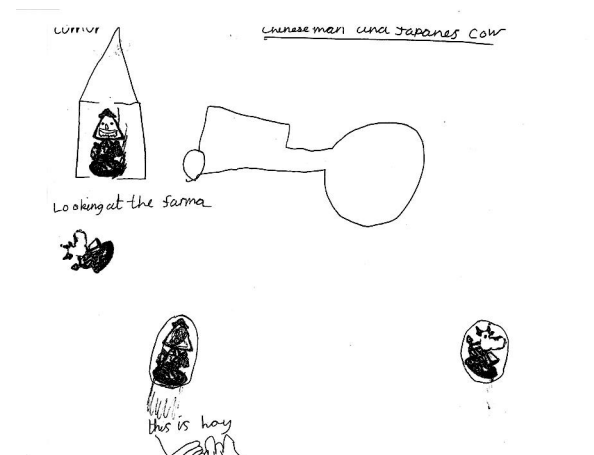
“The ran away Cow”



The Chineys man and the Scotties Cow”



“Chinese man and Japanes Cow”



Although we had originally envisaged that to capture the salient moments the children would first segment their story into a number of pictures, only two children did so. As can be seen from the first two pictures, on their own it is difficult to determine what is happening in these segments. The majority of children preferred to draw one large picture to convey their impressions of the scenario.

These stories do give a sense of what objects were meaningful – the tractor and the music player are prominent in most. Interestingly, the titles that they came up with tended to focus on their interpretation of the nationalities of the characters! The inferences about nationality of the Farmer and the Cow, probably can be attributed to two factors. First many of the children reported that the Farmer might be oriental since “his eyes were funny” and his head was “a funny shape”. Second, when viewing the scenario the children wanted some explanation why the utterances were gibberish – this also fed into the creative explanation that the Characters may be from another country!

Overall, these story-boards provide another way of conveying how the children made sense of the story. Although they are insightful in one sense, taken together with the written stories, our overall impression was that the children had difficulty producing a narrative from what they had seen. One explanation is that watching the scenario in this manner does not facilitate understanding, even though maximum information on the scenario was always provided (from the intelligent camera view). Indeed, the children did appear to get bored when just watching the scenario, but we noted that they were stimulated when their peers made comment on the scenario.

At this stage we changed the methodology. We optimised and extended viewing time, by including an extra session where the action was stopped at salient points and the children were asked questions like “what do you think is happening here”. Using this procedure the children had the opportunity to view the scenario for longer in a way that sustained their interest as well as giving the opportunity to reflect on and discuss the characters behaviour and interaction between characters. This also highlighted the salient moments, which supported and structured the narrative.

In addition, we provided support for how the children completed the next task (expressed the narrative), by asking children (in pairs or in some cases in threes depending on factors like time and requests to work with friends) to tell (rather than write or draw) what they had seen to an adult.

Telling a Story

As noted above, after watching the scenario twice, then they told a story about what they had seen to an adult. Examples of these stories are given below:

*“ Animals making noises. The man had no legs. **Prompt: What happened at the beginning, middle and end?** Music playing. The animals were dancing. Music stopped. Cow kept mooing. Then the tractor came along, stopped and started. Man was getting angry with the cow. Cow was being threatened by the man. The tractor was making noises again “.*

“ Saw trees and grass. Big field with cows and people in it. Farmer kept shouting at the cow and got out a plank of wood to hit on the head. Whenever man and cow went up to music started playing. When man got near to tractor it made noises. When farmer started to cow it started mooing [?] Haystack kept moving. Farmer was trying to hit. Trying to take the cow somewhere, but cow wouldn't So- kept mooing. All the trees were green and looked like Christmas trees with decoration. “

*“ Don't have a clue **Prompt: What happened at the beginning, middle and end?** Farmer leading him somewhere. Cow was following. Stupid noises came on. Farmer tried to lead the cow to the place where you keep him. Cow followed him. That's all he did. They made noises: Cow went moo. Farmer groaned and moaned. He's a moany old git. Bit boring. Haystack kept moving. Need more characters. Need more actions. Farmer's head was a cone “.*

*“ Don't know. **Prompt: What happened at the beginning, middle and end?** The Cow came out. The Farmer came out. They were having an argument. Farmer was getting a bit of chicken out. Farmer was chasing after the cow. Because he got the chicken out, the cow was bending down. The cow was just laying down and the farmer was walking about. “*

“ The cow and the Farmer were having an argument. The cow was trying to get back with the farmer. The farmer didn't want to. The cow kept on following and then wasn't bothered. The cow did something naughty and the farmer chased him off. “

“ When the farmer got club looks like he's angry with cow. The cow looked scared. When crouching down, it looked like he was going to pounce. They were fighting. When big music thing there, it looked like cow dancing to the music. Started off happy (both) then started getting angry with each other. “

“ Man came out of the shed. Cow came out of the gate of the farm. Cow started mooing. Person speaking gibberish to the cow. Went over to the bookcase and the hay. Cow took a pinch of the hay. Went round and round in circles. The man turned the tractor on, then walked over to the bookcase. Spoke some gibberish to the cow. Forced him into the yard, then walked back into his shed. Man got his baton out. Making music with the horn thing. Fighting the cow with the shield. “

“ The cow was getting told off by the man. The cow went to the books. Man went to the tractor. The cow wanted to get to the books, but the man wouldn't let him. “

“ The cow makes too much noise. The man shouts a lot. The man was walking about near the tractor. The man kept getting fed up. He kept telling the cow off. The cow was scared when the man shouted at him. The cow kept crouching down. The cow kept going near the bookcase. When man went near tractor it kept making noises. The cow was making funny noises. “

As can be seen from these stories, this supportive and structured methodology produced more complex narratives than the previous methodology. In terms of the length of the stories, the number of words used ranged between 35 and 92, with an average of 61 words (compared to 23 words for the written stories). The

majority of the stories conveyed something about the interactions between the Farmer and the Cow (66%). Generally, they were more complex and coherent than those obtained previously.

Overall, we found that viewing the scenario only was insufficient, which is probably related to their level of engagement (they tended to get bored very quickly just watching), we therefore structured the session to be more active. For example, after an initial viewing session, we started the system again but this time stopping the action at salient moments. This gave the children the opportunity to share and reflect on, as well as discuss their impressions, in addition to providing structure by selecting the ‘salient moments’. This resulted in a more detailed understanding of the scenario.

5.2 Perception of characters and interactions between characters

In addition to some of the answers obtained during the question and answer session, there were many spontaneous comments about the characters. To help get a flavour of the type of responses and comments that the children made, we have categorised them into groups such as: appearance; movement; communication; other sounds; individual character action, and interaction between characters. This overall data by Farmer and Cow is presented below:

	Total	Farmer	Cow
Overall	286	48% (136)	52% (150)
Appearance	47% (134)	56	78
Appearance of Face	17%(50)	24	26
General Appearance	29% (84)	32	52
Movement of Characters	9%(28)	12	16
Communication	14% (41)	32	9
Other Sounds	8% (24)	4	20
Character Actions	14% (40)	17	23
Interactions between Characters	7% (19)	15	4

As can be seen from above, many of the comments refer to the visual appearance of the characters (47%). Within this category, a large number of children reported that they did not really like or understand why the characters limbs were segmented; more comments were directed to the Farmer, than the Cow. For example, “he’s got no arms”, “his hands come out of his shoulders”, “The Farmer’s got gaps – no neck, no

arms”. This was a constant issue and many of the children made the suggestion that we should join them up!

There were also a lot of comments about the character face. In the case of the Farmer, the children tended to notice the shape of his head, and for the Cow many comments were about the Flower which sometimes they noticed appeared to come out of his nose and on others was in his mouth! Other comments suggest that many of the children noticed when their faces changed colour. The inferences that children made from these were: those directed towards the Farmer, tended to be about his nationality from the shape of his eyes and head, and the colour changes were interpreted as him feeling anger. Those directed towards the Cow included elaborate reasons why the flower may have changed position!

Although there were fewer comments about how the characters move, these were specific, and highlight the salience of character movement. The children tended to notice that the characters ‘gliding’ when they walked, and that they seemed to be walking above the ground. They did not really understand why there was a gap between the characters feet and the ground.

The category communication contains comments about the speech of the Farmer and the noises that the Cow made. Many children commented on the Farmer’s utterances – a large number of children reported that they did not understand why he communicated in a fashion that he did, for example, “doesn’t he know English”, “don’t understand him”, “what’s he saying”, “this is hard to understand”. “they’re not saying a lot are they”. The creative inferences that the children made about this were again about his nationality. For the Cow, the comments about communication tended to reflect the fact that some children got fed up with the Cow always ‘mooring’.

To try to present an overall picture of the Farmer and the Cow’s behaviour, the character actions and interactions noted above, are discussed in conjunction with character data obtained during the question and answer session. Before moving on to children’s impressions of the interaction between characters, each Character is discussed separately.

The Farmer

One of the Farmer actions that the children frequently commented about was reflected in the inferences made about what they thought he had coming out of his mouth. The comments tended to be criticisms about his smoking habits! “He is sick because he is smoking a plant”, “he keeps smoking the same thing”, “he’s smoking”. However, the most salient Farmer action was when the club appeared – the children tended to be fascinated by this, but did not really know what it was, some thought it was a chicken, and others just referred to it as, “that brown thing”. Many children asked us directly what it was. They also

noticed that the Farmer liked the tractor, but quite a few children also thought that he liked the gramophone and the bookshelf as well – perhaps based on how often he visited these.

Overall, the children tended to think that the Farmer was an angry character throughout and made no comment about, and did not appear to notice, any change in this. As such, we can infer that they did not detect any change in status or behaviour.

The Cow

The action that was most commented on, was that the Cow was very interested in the gramophone and the bookshelf. They made frequent comment to the Cow going to “the music thing” and his dancing and singing. Many children reported that they liked the Cow doing this, “he is cool”. Unlike the Farmer, they did notice the change in the Cow’s appearance (status), but for a number of children they thought that the Cow had changed into something else “why has the Cow changed into a turtle” or “that a car”. The changes in behaviour were for whatever reason less salient.

The Interaction between Cow and Farmer

The majority of children thought that the Cow was trying to run away from the Farmer, and the Farmer was trying to catch the Cow. However, a smaller proportion of the children thought that the Cow was trying to follow the Farmer. The overall interaction behaviour was seen as the Farmer trying to get the Cow back into his field (“shed”, “pen”, “field”), the overall behaviour of the Cow to this interaction was interpreted as him “running away”.

The immediate response to the appearance of the club, tended to contribute to a very negative picture of the interaction between the Farmer and the Cow, with the Farmer being described as , “a moany old git”, which contributed to the large majority of children suggesting that the Farmer wanted to hurt or even kill the Cow! Indeed, when specifically asked the question, whether the Farmer liked the Cow, 100% of the children said that he did not. However, this was not seen as reciprocal on the part of the Cow, with 20% of the children thinking that the Cow actually liked the Farmer.

Overall, the children saw little change in the interaction between the Farmer and the Cow, as noted above they tended to see all interactions in a similar way, and interpret the narrative as such.

6.0 Design and re-design suggestions from children

The children had lots of ideas for improvement of the system: Their comments were not only prompted by specific questions, but were noted throughout our time at the school.

A large number of the children suggested that we could make the system better by making the characters talk more, not gibberish, but in English. Obviously, this is a very important issue, given the number of times that the Children referred to it. Since we are encompassing a recording facility in Work Package 3, their good suggestions are timely.

Many of the children, suggested that the system could be improved by joining up the characters limbs – as already noted, the overall impression from a large proportion of the children was that they would prefer less of a gap between limbs.

The overall impression of the world is that it is sparse. The children commented that they wanted to see more – more people, more animals, objects, more plants and more weather, and some changes that would reflect the day passing by! They also wanted the characters to be able to go inside the buildings, which reflect the wishes of the Children to see inside. They also mentioned things like food and water for the animals and the Farmer. Another suggestion was for the Farmer to be able to go on his Tractor, and the Tractor to move around. They thought that it would be great to include some action of this sort.

We directly asked the children, if they thought that it would be interesting for younger children. While the majority of children gave a “yes” response to this direct question, 30% were not as sure, and thought that younger children might be a little bored, or would not like it.

7.0 Summary

- There is little doubt that the system with animations is far more engaging to the children than previously. Given support/scaffolding, there was a far higher degree of visual attention and it was easier to get the children to comment on the action and get involved with what they saw. This is a major step forward from the situation before the last review. The animations are highly visually effective and, with minor glitches, the pace of the action sustains interest.
- The higher levels of engagement mean that the scenarios the children watch are of definite potential in terms of involving them in situations where learning can occur. For example, there was strong evidence of the children trying to work out the motives and intentions of the agents.

This is one of the goals that the PUPPET theatre was trying to achieve and demonstrates the potential of this sort of system.

- The children's attributes within the scenario did not, however, perfectly map onto the dramaturgical scenario as the designers intended. Many of the basic actions were correctly perceived but 'Status', as we have conceived it, did not uniformly flow from what they saw. Rather, there was a tendency to interpret the behavioural changes we used to flag status in terms of the agent doing something different, such as 'simply' changing its shape. One possibility here is that, with far more explicit prompting/scaffolding of the idea of status, they would perceive these changes in the way intended. This in turn, would allow a better reading of the projects of the cow/farmer. As another suggestion, the use of more explicit facial expressions (or more readable ones) could have a similar effect.
- The system tested here also had a limited interactivity which, as has been flagged before, is somewhat limiting. However, the advent of the 'recording' facility which has already proved very engaging, is a big step forward.