

# Differentiating Real Versus Unreal in Children: An Investigation Using GIF Stimuli

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## Abstract

*Virtual Reality Judgment is a part of cognitive development. With advancing cognitive development children will develop judgmental abilities enabling them to differentiate reality vs myth. This study explores the development of reality judgment abilities in typically developing children aged 3-6 years. Reality judgment, encompassing both character and action ability perception, is crucial for a child's accurate perception of the world. Existing research on reality judgment often stems from Western contexts, and the study addresses the need for cultural sensitivity in investigating these abilities. Using a sample of 30 participants divided into different age groups (4-5 years and 6-7 years), the study employs a reality judgment task with GIF stimuli to assess participants' discernment between realistic and unrealistic actions. Results indicate significant age-related differences in reality judgment abilities, with the older age group outperforming the younger ones. The stimulus sets, comprising both realistic and unrealistic GIFs, further highlight the nuanced nature of children's judgments. The research uses non-parametric statistical tests, and the results show a substantial difference between the age groups overall. Group comparisons through Mann Whitney U tests confirm the disparities between each pair of age groups. The results highlight how reality perception skills develop in children with regular development. Younger participants struggle with accurately discerning realistic actions, often providing inconsistent justifications. In contrast, older children exhibit improved performance but still face challenges in articulating reasons for labeling stimuli as incorrect. The study contributes valuable insights into the age-related progression of reality judgment.*

**Keywords:** GIF stimuli, reality Judgement, perception, cognitive development, age-related differences.

## INTRODUCTION

Children are fantasized with colourful content; the colourful content would trigger children to view

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this content and children below the age of 6 years tends to watch this content at least for two hours a day as per a study carried out in the United States of America [1]. Similar studies have been reported in China as well [2]. This can be extrapolated to internet and YouTube also. In order to attract children, content makers tend to use animations. The characters are animated and these characters are made to perform actions which are again animated [3]. When children view these content, some children may believe that the content is real [4]. These contents are made so real that some children assume these actions are real. These abilities are assumed to exponentially increase with age. A study which has been carried out in 1990's [5] showed that children who are as young as 2 years would be able to differentiate real versus unreal judgment. There were contradicting evidences for the same

while another study states that the confusion persists till the age of 3-4 years only after which children are able to differentiate real and unreal [6]. Another study has showed that these abilities develop by the age of 5 years [7].

Reality judgment refers to the ability of an individual to judge if the state of thing actually exists in reality. The concept of reality judgment emerged from the concept of ontological principle, which deals with the philosophical reality. The terms real entity and virtual entity is often used in describing ontological principle. The term real entity refers to the ability to identify if a character actually exists in reality, virtual entity on the other hand refers to the ability to identify if a character is just confined to virtual word or exists in reality. An object or character that is limited to a digital or hypothetical domain is referred to as a virtual entity, whereas a real entity is something that exists independently in the physical world. A character in a video game symbolizes a virtual creature, yet a chair in a room is a real object. Thus, reality assessment entails the identification of these things, enabling people to skillfully move between the simulated and real parts of their experiences.

Age is known to enhance these skills. A study carried out the development of reality judgement claimed that the ability to differentiate real entity with a virtual entity would develop by 5 years [8]. A child who is about 5 to 6 years old will be able to discriminate based on the 'world' they exist. The term world refers to environment in real. Once they develop clarity about the real environment, it becomes easier for them to identify the characters portraying virtual reality. The ability to judge is important for perception. The perception becomes more realistic and concrete once reality judgment is developed.

Action ability judgment is another dimension of reality judgment. Action ability perception refers to the ability to judge if the action carried out by agents is real or not. A study [9]. Examined the action ability perception judgement in typically developing children by using action cards and found that the children develop this ability by 6-7 years. Younger children see cartoons and consider their favourite cartoon characters as real [10]. The actions carried out by these characters is also perceived real. The action ability judgment is known to follow the reality judgment pertaining to characters. In other words, based on the characters, action ability judgment is initiated.

These two dimensions (character judgment and action ability judgment) are often explored in typically developing children. The abilities are known to mature with age, however the individual variability is accounted in such studies. The development of these abilities is important for the development of perception and it is also known to induce readiness for a person to get ready to confront the real word. These abilities can be explored in children with abilities as these children would manifest difficulty in judgment. In order to understand about these abilities in children with autism, understanding on when and how the abilities develop in typically developing children is important, this necessitated the present study. As explained above, reality judgment is important for children to gain a better perception.

Most of the studies have been carried out in Western context, as the reality ability judgment is sensitive too cultural background, the findings from western studies cannot be generalised. Most of the western studies have used action pictures to tap action ability perception in children. GIF stimulus can be used to test the action ability perception ability and is more attractive and would impose more load on the participants. Furthermore, the majority of research conducted in the West have used static action pictures to measure children's perceptions of their action abilities. A more realistic and rigorous assessment of action ability perception can be obtained by using GIF stimuli, which are dynamic and captivating. This makes the evaluation procedure more alluring and places a greater cognitive strain on participants.

### **Aim of the Study**

To investigate reality judgment abilities in typically developing children.

### **METHODOLOGY**

The research involved 30 individuals. Three groups were formed out of the kids. Group 1 comprised of 10 children studying in the age range of 4-5 years, while group 2 consisted of 10 children in the age range of 4-5 years and group 3 consisted of 10 children in the age range of 6-7 years. Reality judgment task was administered on the participants.

### **Stimulus**

The stimulus consisted of 30 pictures presented in gif format. The pictures are also called as action pictures as they represent some action through movement. The pictures further were divided into two sets. The first set comprised of 15 realistic gif stimuli. Pictures in this set comprised of actions which were realistic like cow eating grass. While the second set consisted of unrealistic gif stimulus. The unrealistic gif stimulus was unreal. Example for an unreal gif stimulus included that of a man with wings, flying with birds. The gif stimulus was collected directly from internet sources. Pictures from set 1 and set 2 were randomised and presented as power point presentation.

### **Procedure**

The participants were asked to say 'Yes' to denote a response, which they felt was realistic. The participants were asked to say 'No' to denote a response, which they felt was unrealistic. If the response was no, the participants were asked to justify their responses. This was carried out to counteract the false positive response, which may arise from guessing. The right answer received a score of 1, whereas the wrong answer received a score of 0. 30 was the highest possible score. The responses secured by participants of each of the groups were tabulated separately and analysed.

### **RESULTS**

Group 1 participants secured a mean score of 14, group 2 participants secured a score of 21 and group 3 participants secured a mean score of 27. The Kruskal Wallis test was used to see whether there were any statistically significant differences between the three groups. A non-parametric test called the Kruskal Wallis test was employed because the data did not follow the characteristics of a normal distribution.

The  $X^2$  value obtained was 3.44 and corresponding p value showed significant difference between the three groups ( $p < 0.05$ ). The groups were compared in pairs by using Mann Whitney U test. The Z score obtained by comparing group 1 with group 2, group 2 with group 3 and group 1 with group 3 was 3.88, 2.24 and 3.12 and the corresponding p values showed significant difference for all three comparisons.

Z-scores of 3.88, 2.24, and 3.12 were obtained for the comparisons between Group 1 and Group 2, Group 2 and Group 3, and Group 1 and Group 3. P-values indicating significant differences ( $p < 0.05$ ) between the groups were obtained for each comparison. These findings demonstrate a distinct developmental path in these cognitive capacities by confirming that older children outperformed their younger counterparts on reality judgment tests. This shows that as people age, their ability to judge reality may improve as a result of growing cognitive maturity and exposure to a wider range of real-world situations.

### **DISCUSSION**

Group 1 children were young and the reality judgement abilities were poor in these children, it was cross verified if they understood the instructions, by imposing questions. They understood the task but were not able to give the right judgments. They said yes for stimuli such as the dog driving a car, an elephant drawing a picture etc. They had confusions for identifying the correct response as well as ruling out the incorrect response. The justification was not convincing in some occasions.

Group 2 children were able to perform the task better compared to group 1. They understood the instructions easily; they performed better in identifying the correct responses. They often failed to give

a correct explanation for the stimuli, which they felt were incorrect. Group 3 children performed better compared to the other two groups. However the scores did not reach the maximum. It was observed that these children were not able to list down the correct justification after calling a stimulus as incorrect in some occasion, this would have reduced the score.

The findings of the current study stays relevant as it uses GIF stimulus which is contemporary in nature and has not be used in of the cited studies to the best of our knowledge and the all the studies have been carried out in Western context unlike the current study which was carried out in Western context.

Three groups of individuals were selected for the study. Group 1 represented younger children as old as 3 years while the third group consisted of children who were as old as 6 years. The age range was considered after a careful review of literature. Some of studies in this direction have proposed that the virtual reality judgment develop by the age of 2-3 years while some other studies have shown that these abilities develop by the age of 5 years. The current study was in consonance with the finding of the latter study as children who were as young as 3 years exhibited difficulty in differentiating realistic versus unrealistic scenarios [8, 9]. These abilities improved exponentially [10]. The strength of the study was the configuration of the experiments and the basic limitation of the study was that limited number of participants were considered for the study and has to be extended further to enhance the generality.

## CONCLUSIONS

The purpose of the study was to examine reality assessment skills in children aged three to six who were generally developing. Three age-based groupings of children were formed. Participants were shown 15 correct and 15 erroneous GIF stimuli, which were chosen at random. A judgment task was given to the participants. Group 1 children performed poorly compared to group p2 children. Group 3 children performed better compared to the other two groups. The participants failed to identify an incorrect GIF stimulus and state the reason for labelling the response as incorrect.

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