



## Introduction

There is scarce literature on the development of children's understanding of regret and relief. Only two tasks have been used: *the stories task*<sup>1,3,4</sup>, children heard stories about characters who made decisions that led to regret and relief and *the games task*<sup>2</sup>, participants themselves played a game involving decisions that led to regret or relief.

Results suggested that by 7, children understand regret. The age at which relief develops has not been determined.

We compared the two tasks using three experiments to (1) investigate the lag between regret and relief, (2) determine the onset of relief and (3) investigate the difference between children's understanding of their own regret and relief and that of others.

## The Tasks

### The Stories Task (Based on Guttentag & Ferrell, 2004)

Two stories were read. In both, one protagonist made a decision and the outcome was worse in contrast to the alternative. For the other, the same negative outcome would have occurred whatever the decision. E.G. The Broken Robot

"Tom is allowed to choose between a robot and a car to play with at break-time. Tom chooses the robot and it turns out to be broken, so he gets upset. At the end of break-time, Tom sees the car and it wasn't broken, so if he chose the car, he wouldn't have been upset. On another day, Andy is allowed to choose between the robot and the car to play with at break-time. Andy chooses the robot and it turns out to be broken, so he gets upset. At the end of break-time, Andy sees the car and it was also broken, so he would have been upset no matter which toy he chose"

Participants were asked to identify 'who felt worse' and give reason  
5 x memory and comprehension questions for each story.

### The Games Task (Based on Amsel et al., in prep.)

(1) Participants choose between two boxes that contained differing quantities of stickers.



(2) Rate their feelings about their chosen box

(3) View the contents of the non-chosen box



(4) Rate their feelings about their first box once again.

2 x regret trials (initial box contained 2 or 3; alternative box contained 8)

2 x relief trials (initial box contained 2 or 3; alternative box contained zero)

## Experiment 1

n = 106  
age 5-6, n = 21, mean age = 5;7; age 6-7, n = 19, m = 6;7; age 7-8, n = 19, m = 7;8; age 8-9, n = 23, m = 8;10; adult, n = 24, m = 20.4 years

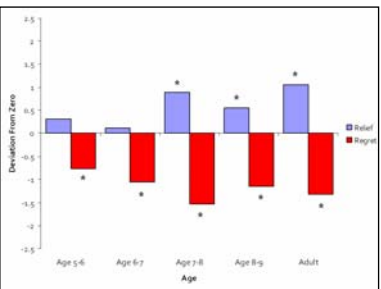
*Stories:* No difference between stories (McNemar: n=22; k=8; p = .286)  
Only 4 of 82 children chose correct protagonist in both stories.

Age	Number of Correct Responses		
	0	1	2
Age 5-6	11	8	2
Age 6-7	16	2	1
Age 7-8	14	4	1
Age 8-9	15	8	0
Total	56	22	4
Adult	2	0	22

*Games:* 5-6 year olds demonstrated regret as the initial score subtracted from the second score differed from zero. Relief was shown in 7-8-year-olds = evidence of lag.

*Comparison of two tasks:* all child participants performed significantly better on games task (Friedman:  $\chi^2_2(19) = 14.010$ ;  $p = 0.003$ ).

No difference for adults.



\* p significant < .05

## Experiment 2

In the stories, children may have struggled to comprehend the question but children's performance on the games task using the rating scale was good. In exp. 2, children were either asked the same test question from exp. 1 (decision condition) or were given a new task of rating each character's feelings on the scale (scale condition).

n = 70 – age 7-8, n = 26, m = 7;9; age 8-9, n = 28, m = 8;11; adult, n = 16, m = 19.3 years

*Results:* No difference between the two conditions (Kolmogorov-Smirnov: D(n=53) = .347;  $p > .999$ ).  
No difference between age groups (K-S: D(n=53) = .477;  $p = .997$ ).

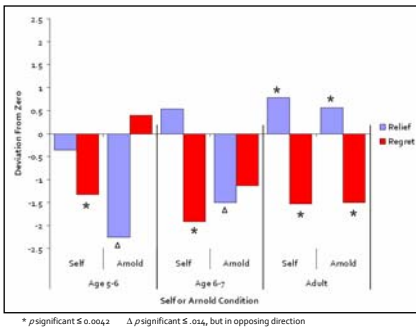
Wording of the question cannot explain failure.

Age	Scale Condition			Comparison condition		
	0	1	2	0	1	2
Age 7-8	6	5	2	6	5	2
Age 8-9	7	4	3	9	1	3
Total	13	9	5	15	6	5
Adult	0	1	7	0	1	7

## Experiment 3

Another difference between the stories and the games task is in whether the target of regret is oneself or another person. In exp. 3, children either replicated the procedure of the games task from exp. 1 (self condition) or rated a toy penguin's feelings after playing the game (Arnold condition).

n = 53 – age 5-6, n = 28, m = 5;6; age 6-7, n = 25, m = 6;9; adult, same as exp. 2



\* p significant < 0.0042    Δ p significant < .05, but in opposing direction

*Self condition:* No significant difference from zero on relief, replicating exp. 1.

*Arnold Condition:* Children did not respond like adults to either regret or relief. Children's performance on relief was so poor, they stated that Arnold was regretful when he should be relieved (Δ).

Significant difference between self and Arnold:  
For both relief ( $t(64.095) = 4.339$ ;  $p < .001$ ) and regret ( $t(67) = -2.676$ ;  $p = .009$ ).  
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## Conclusions

We found that children demonstrated an understanding of their own regret from 5-years and their own relief from 7-years-old. We also found that children up to 9-years failed to demonstrate this understanding for others.

The 5-7-year-olds failed to demonstrate an understanding of relief for themselves. Children may not spontaneously think about 'what could have been' if the actual outcome was positive<sup>5</sup>. If the alternative possible outcome was more salient, children may show an understanding of relief.

In order to pass the Arnold condition in games task, children had to grasp the task for themselves and then infer that knowledge to someone else. We hypothesized that this was too difficult for 5-year-olds perhaps due to increased information processing demands.

Future work includes investigating the youngest age that children can pass the self condition of the games task. The literature suggests no younger than 5-years-old<sup>6</sup>.

## References

<sup>1</sup>Guttentag, R.E. & Ferrell, J. (2004). Reality compared with its alternatives: Age differences in judgements of regret and relief. *Developmental Psychology*, 40(5), 764-775. <sup>2</sup>Guttentag, R. & Ferrell, J. (2007). Children's understanding of anticipatory regret and disappointment. *Cognition and emotion* 24(5), 815-832. <sup>3</sup>Ferrell, J. & Guttentag, R.E. (in press). Children's understanding of counterfactual-thinking-based emotions: The effects of counterfactual-information salience. *British Journal of developmental psychology*. <sup>4</sup>Amsel, E. & Smalley, D. (2000). Beyond reality and truth: Children's counterfactual thinking about pretend and possible worlds. In K. Riggs & P. Mitchell (Eds.), *Children's reasoning and mind* (pp. 99-134). Brighton, England: Psychology Press. <sup>5</sup>German, T. (1999). Children's causal reasoning: Counterfactual thinking occurs for 'negative' outcomes only. *Developmental science*, 2, 442-447. <sup>6</sup>Fabes, R.A., Eisenberg, N., Nyman, M. & Michalieu, O. (1993). Young children's appraisals of others spontaneous emotional reactions. *Developmental psychology*, 27, 858-868.