

REPORT

Children's understanding of the Ulysses conflict

Katherine S. Choe, Frank C. Keil and Paul Bloom

Department of Psychology, Yale University, USA

Abstract

Two studies explored children's understanding of how the presence of conflicting mental states in a single mind can lead people to act so as to subvert their own desires. Study 1 analyzed explanations by children (4–7 years) and adults of behaviors arising from this sort of 'Ulysses conflict' and compared them with their understanding of conflicting desires in different minds, as well as with changes of mind within an individual across time. The data revealed that only the adults were able to adequately explain the Ulysses conflict. Study 2 asked children (4–7 years) and adults to choose among three explicitly presented competing explanations for self-subverting behaviors. The results suggest that an understanding of the influence of conflicting mental states on behaviors does not occur until at least 7 years of age.

Introduction

Ulysses wanted to hear the song of the Sirens, but knew that if he did so, he would be compelled to walk off the boat into the sea. So he told his sailors to bind him to the mast and 'whatever he might say or do, by no means to release him till they should have passed the Sirens' island' (see Elster, 1979). This is a particularly dramatic example of how one might cope with conflicting desires, but more mundane 'Ulysses conflicts' are part of everyday life. Some people do not buy large boxes of cookies because they know that they will later eat them, or ask their friends not to give them cigarettes in the future no matter how much they beg, or place their alarm clock far from their bed, so they cannot easily switch it off in the morning. One author of a self-help book describes how he instantly smears mayonnaise all over tempting sweets served with airline meals to keep from eating them during long flights; another would Fed Ex his internet cable to himself, so to have a day without the distractions of the web (Burnham & Phelan, 2001).

Under some versions of the Ulysses conflict, the forbidden desire is in the future (when Ulysses gave his instructions, he was not yet under the Sirens' spell); under others, the individual suffers from the conflicting desires simultaneously – eat the sweets *and* don't eat the sweets – and one desire motivates some action that defeats the other. In some cases, the person successfully overrides the 'bad' desire; in some, the person does not

– as in the man described by Schelling (1984, p. 61) who 'in self-disgust grinds his cigarettes down the disposal swearing that this time he means never again to risk orphaning his children with lung cancer and is on the street three hours later looking for a store that's still open to buy cigarettes'.

All notions of the Ulysses conflict presuppose a certain conception of the mind as a mosaic, as composed of conflicting desires and impulses. This conception is defended by many philosophers and psychologists (from Heraclitus to Freud to Dennett), and is present as well in Christian theology. And, within some cultures, it is part of our common-sense conception of the mind, which is why we can readily understand the sort of scenarios described above and can even productively act in ways that we construe as subverting our own desires.

It is unclear, however, when this conception emerges in children. There does exist a major developmental change between preschool and early elementary school in the ability to inhibit current impulses for larger future gains – for instance, to resist the temptation to eat a single cookie so to get multiple cookies in the future (Mischel, Ebbesen & Zeiss, 1972). There is even evidence for some use of Ulysses strategies to this end, as when a child covers a desired object with a cloth so she will not be tempted by its appearance (Mischel, 1981) or sits on her hands to make the cookie harder to reach (Vaughn, Kopp & Krakow, 1984). But it is an open question as to when children actually understand why such strategies can be fruitful.

Address for correspondence: Katherine Choe, Department of Psychology, Yale University, New Haven, CT 06511, USA; e-mail: katherine.choe@yale.edu

More generally, there has been considerable research to date into children's understanding of notions such as beliefs, desires and goals – notions that are arguably universal (Bloom, 2004; Fodor, 1992; but see Lillard, 1998). But we know relatively little about the emergence of culturally specific beliefs about the mind, such as the notion that it can contain conflicting desires. We explore the emergence of this understanding in the studies below.

Study 1

Study 1 examined children's and adults' understanding of conflicting mental states by showing them behavior consistent with three different scenarios – conflicting desires in two minds, sequential conflicting desires in one mind, and simultaneous conflicting desires in one mind. We explored whether children would understand the origins of self-subverting actions in terms of internal conflicts.

Method

Participants

Five age groups participated – 18 4-year-olds (12 males and 6 females), 28 5-year-olds (9 males and 19 females), 25 6-year-olds (6 males and 19 females), 29 7-year-olds (12 males and 17 females) and 50 adults (16 males and 34 females). Children were recruited from two Catholic elementary schools in a middle-class community in the greater New Haven area, and adults participated as part of their Introductory Psychology course requirements at Yale University.

Materials

Brief scenarios were prepared on a video camcorder and were edited into short films for computer display. Different adult actors performed in three situations in which the pull of an opposing desire for one's own long-term benefit is commonly understood: (1) wanting to eat cookies; (2) wanting to smoke; and (3) wanting to play computer games. These three situations were picked as similar to ones that children might well have observed in others. Two of these could have also been experienced by the children themselves (cookies, computer games); the third most likely not (cigarettes).

Each situation was filmed in three different conditions:

- In the Two-person condition (TWO), the main character encountered a highly desired object, but an external agent thwarted her desire by putting the object away.
- In the Change of Mind condition (COM), the main character changed her mind and put the desired object away upon hearing that it was no longer desirable (e.g. stale, dirty or broken).
- In the Ulysses condition (UL), the character expressed her desire toward a particular object, but then acted so as to thwart the satisfaction of that desire (a Ulysses action).

Regardless of the condition, the movies would end with the identical scene: the main character would stare at the desired object (cookies, cigarettes or a computer game) with an expression of longing and disappointment. See Table 1 for the examples of the scripts and questions.

Table 1 Examples of scripts and questions used across the three conditions in Study 1

| Two-person (Cookies) | Change of mind (Smoking) | Ulysses (Games) |
|---|---|---|
| <p><i>Part 1: (A enters the room and sees a box of cookies on the table.)</i> A: Yumm. I love cookies! They are so yummy. (<i>Picks a cookie up and is about to eat it when B enters the room. B looks at A disapprovingly, puts the cookies high up on a shelf and exits the room.</i>)</p> | <p><i>(A is sitting at a table and sees a pack of cigarettes and a lighter on it.)</i> A: I enjoy smoking! It's really relaxing. (<i>Takes out a cigarette and is about to light it when B peeks into the room to inform A.</i>) B: Hey, those cigarettes are bad. They were soaked in dirty water before. (<i>B exits. A thinks for a while and puts everything in a closet, locks it up and throws away the key. Sits back down.</i>)</p> | <p><i>(A is studying at a table of books. Glances over at the laptop next to her.)</i> A: I love playing computer games! It's so much fun, and I love spending all my time playing them. (<i>Is about to start playing the game, but thinks for a moment and closes the laptop. Puts it in a nearby box and puts a lid on it. Sits back down.</i>)</p> |
| <p>1. What happened in the movie? 2. Why did she put the cookies/cigarette/game on the shelf/in the closet/in the box? 3. Why did she put them so high up/lock the closet/put the lid on top?</p> | | |
| <p><i>Part 2: (A looks up at the cookies every now and then and agonizes.)</i></p> | <p><i>(A looks at the closet every now and then and agonizes.)</i></p> | <p><i>(A looks at the box every now and then and agonizes.)</i></p> |
| <p>4. How is she feeling now? 5. Why is she _? 6. Why can't she eat the cookies/smoke a cigarette/play the computer game? 7. If that's the case, then why is she _?</p> | | |

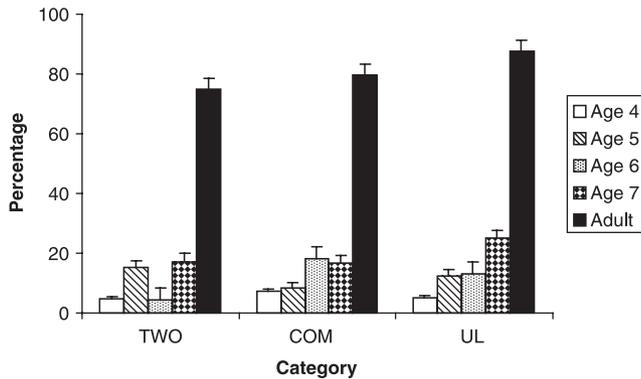


Figure 1 Percentage of choosing Conflicting State of Mind across TWO, COM, and UL in the Cookies movie by age in Study 1. The x-axis represents the three conditions, and the y-axis indicates the percentage of the participants in each group responding that there was some conflicting state of mind expressed in the movie.

Procedure

Each movie was shown in its entirety to participants first, and then, upon the second viewing, the movie was paused after the scene in which the object was put away (after Part 1), and the action-oriented test questions 1–3 were asked. After the second half of the movie was shown (after Part 2), the desire-oriented questions 4–7 were asked. Each participant was shown three different movies, one from each of the three conditions in a preset random order.

Results and discussion

After examining the participants' responses, a coding system was developed to parse the responses according to whether the participants mentioned Conflicting State of Mind to any of the questions (e.g. 'She wants the cookies, but she can't'). Two coders independently coded the responses, and the kappa analyses indicated that they agreed 90.8% in TWO, 93.1% in COM and 95.8% in UL, $ps < .05$. All disagreements were resolved by discussion. The percentage of each age group mentioning Conflicting State of Mind is illustrated in Figure 1 for one of the movies across the three conditions. Adults mentioned Conflicting State of Mind far more than the children in all three conditions (based on the Mann-Whitney between-subjects analyses, all at $p < .0001$). The four groups of children did not differ from one another.

The Conflicting State of Mind code represented a general sense of discord either between or within characters.

Table 2 Mean ratings with standard deviations on Internal Conflict expressed by participants in the UL and TWO conditions in Study 1

| | Two-person | Ulysses |
|-------|-------------|-------------|
| Age 4 | 1.99 (1.47) | 1.96 (1.49) |
| Age 5 | 2.37 (2.03) | 2.79 (1.75) |
| Age 6 | 2.38 (2.31) | 3.22 (1.70) |
| Age 7 | 2.38 (2.07) | 3.71 (1.70) |
| Adult | 4.29 (1.23) | 6.22 (2.34) |

Note: Standard deviations are indicated in parentheses.

To assess understanding of the Ulysses conflict in particular, a second analysis examined whether participants referred more to Internal Conflict (created by having two different desires in one mind) when describing the UL situation than in the TWO situation. These two conditions represented the closest pair to place in contrast: Conflicting desires that co-occurred in real time were present in both with the only difference being whether the conflict was in one mind versus in two. Participants' responses to the questions that pertained directly to the source of the conflict ('Why did she put the cookies/cigarettes/games up on the shelf/in the closet/in the box?' and 'If that's the case, then why is she upset?') were presented in a random order to five raters naïve to the purposes of the study. They rated each excerpt on the extent that an internal conflict was expressed, using a 7-point scale (1 being No Internal Conflict and 7 being Strong Internal Conflict). Responses like, 'Because he didn't want her to eat them. Because her dad took away the cookies, and now she can't eat them anymore' were rated as 1, 'So she could finish her homework. She's sad because she really wants to play videogames' as 4, and, finally, 'Because she decided she didn't want to smoke . . . Part of her wants to smoke, but the other part doesn't' as 7. See Table 2 for the mean ratings for UL and TWO.

We expected the ratings of the participants' excerpts that expressed Internal Conflict to increase over development and to be higher in UL than it was in TWO. Indeed a univariate analysis of variance revealed strong condition and age effects for 6 years on ($F(1, 276) = 103.37$; $F(1, 276) = 69.336$; $F(4, 276) = 157.290$, respectively, all at $p < .0001$) and a condition-by-age interaction ($F(4, 276) = 11.490$, $p < .0001$). A Tukey analysis further showed that regardless of the type of condition, the 4-year-olds expressed Internal Conflict in their responses the least, followed by the 5- and 6-year-olds. The 6- and 7-year-olds' degree of expressing Internal Conflict exceeded that of the younger children, but they failed to acknowledge it as much as the adults did ($p < .05$).

In addition, the degree of Internal Conflict articulated by the 6-, 7-year-olds and adults in UL was significantly

higher than it was in TWO ($t(1, 23) = 3.24, p < .005$; $t(1, 27) = 5.95, p < .001$; $t(1, 48) = 11.42, p < .001$, respectively). There was also a significant age difference between each of the child groups and adults in both UL and TWO, respectively (all at $p < .0001$).

In sum, while all age groups showed some sensitivity to the general notion of mental conflict, when the degree of Internal Conflict was investigated further with excerpts that focused on the source of the conflict, the raters judged that even the 7-year-olds did not differentiate between UL and TWO as well as the adults did. Thus, a full recognition of Internal Conflict seems to emerge much later than the age at which children behaviorally master self-control in a similar situation (Mischel & Mischel, 1983).

Study 2

Study 2 was designed to further explore developmental changes in children's representation of conflicting desires in a forced-choice format on the assumption that it might provide a more sensitive measure of their ability to understand internal mental conflicts.

Method

Participants

The participants included 12 4-year-olds (6 males and 6 females), 21 5-year-olds (11 males and 10 females), 25 6-year-olds (13 males and 12 females), 26 7-year-olds (8 males and 18 females) and 25 adults (6 males and 19 females). All the participants were individually interviewed. They were recruited from the same community as Study 1, and none of the participants had been part of Study 1.

Materials and procedure

Each child at first received a brief training session on the meaning of a thought bubble. They were shown a picture of a girl, with a thought bubble extending from her head. The thought bubble contained a picture of a flower, and children were asked (1) what the picture was depicting, and (2) what she was thinking about.

For the test phase, scenes were captured from the Cookies and Games movies used in Study 1 and made into 8 × 11-inch still color pictures. Each participant received two conditions – Ulysses (UL) and Non-Ulysses (NUL). In each, the participants were told a story, such as those shown in Table 3. In the UL condition, the character was described as having smiled upon seeing a

Table 3 Examples of scripts used in the UL and NUL conditions in Study 2

| Ulysses condition | Non-Ulysses condition |
|--|--|
| Jane saw cookies on the table. She smiled at first, but in a little while, she frowned. Then she stood on a stool and put the cookies on the shelf. When she put the cookies on the shelf, what was her mind like? | Mary saw a computer game in the box. She frowned at first, but in a little while, she smiled. Then, she took the lid off the box and took the computer game out of it. When she took the computer game out of the box, what was her mind like? |

desired object in an easily accessible location and then frowning, and finding a way to thwart her desire. Such stories were intended to depict a Ulysses conflict, in which a character acts to thwart a desire. The NUL condition portrayed the opposite order of situations in which the character frowned when she saw a desired object in an inaccessible location, but then smiled upon finding a way to satisfy her desire. This was intended to represent a non-Ulysses case with a single constant desire that is initially thwarted by circumstances and then overcome.

The UL and NUL stories were presented in a counter-balanced order to each participant with the corresponding pictures in a fixed order. The Want thought bubble had a picture of the object while the Not Want thought bubble displayed the same object, crossed out with a big X mark. Finally, the Internal Conflict thought bubble contained both a picture of the object and a picture of the object crossed out side by side (see Figure 2 for the sample pictures).

As the pictures of each thought bubble were placed before the participant consecutively, the experimenter posed each of the corresponding states of mind as follows: ‘. . . What was her mind like? Was she thinking, “I want to eat these cookies”, “I don’t want to eat these cookies”, or “I both want and not want to eat these cookies at the same time?”’ We expected those participants who understand that one could hold two opposing desires simultaneously in a single mind to choose the Internal Conflict thought bubble. The adults were shown a laminated copy of the written vignette with 3 × 4-inch pictures and were asked to mark their responses on a separate answer sheet.

Results and discussion

The percentages of each response the participants chose are shown in Figure 3. The results of Mann-Whitney analysis revealed a significant difference between the UL and NUL conditions ($U(1) = 4469.000, p < .0001$). More specifically, in NUL, all age groups chose the expected response (Want) at a level greater than chance



Figure 2 Pictures and corresponding states of mind presented in the Cookie condition in Study 2. Pictures (a) – the Want state and (b) – the Not Want state – showed the presence of one state of mind while Picture (c) illustrated a conflicting state of mind – the Internal Conflict state.

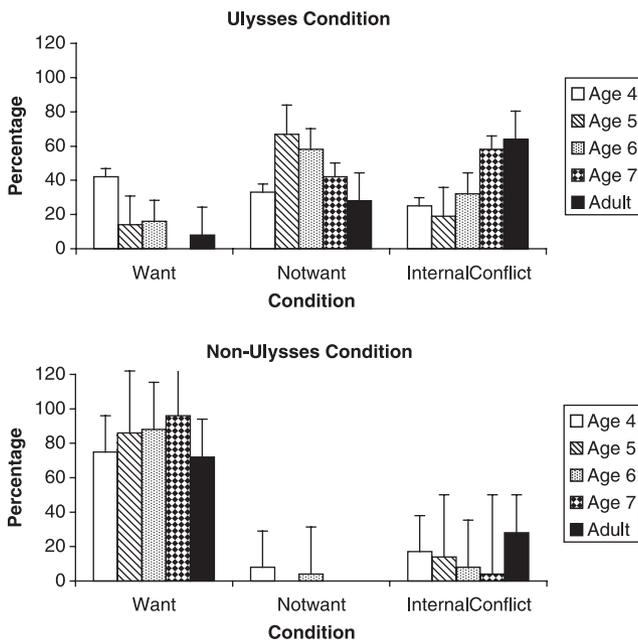


Figure 3 Percentage of responses across UL and NUL by age in Study 2. The x-axis represents the three response types, and the y-axis indicates the percentage of the participants by age selecting each type.

in comparison to the other two responses (Not Want and Internal Conflict) (all at $p < .05$). In contrast, in UL, only the adults and 7-year-olds correctly chose Internal Conflict as illustrating the character's state of mind more frequently than chance (as opposed to selecting the other responses) ($U(1) = 7.000$ and $U(1) = .000$, respectively, at $p < .0001$). Thus, as anticipated, while there was

no age difference in NUL, a significant age difference was present in UL as the adults selected Internal Conflict significantly more often than the 4-, 5- and 6-year-olds ($U(1) = 91.50$; $U(1) = 144.50$; and $U(1) = 212.50$, respectively, all at $p < .05$). Although there was no significant difference between the 7-year-olds and adults, the performance of the 7-year-olds was only marginally different from two of the younger groups – the 4- and 6-year-olds – ($U(1) = 105.00$; and $U(1) = 107.50$, respectively, at $p < .06$; $U(1) = 167.50$, $p < .01$ with the 5-year-olds).

Thus, when the task was presented in a forced-choice format, the adults and the 7-year-olds, but not younger children, recognized Internal Conflict in the Ulysses situation whereas the non-Ulysses situation was understood in the same manner by participants at all ages. This pattern of results reinforces the findings of Study 1 and suggests that children have a specific difficulty with understanding how a single person can 'be of two minds'.

General discussion

In two experiments, children's and adults' understanding of conflicting desires was examined by presenting them with a character that simultaneously held two opposing desires in her mind and subsequently acted in a way that would thwart one of the desires; the data showed that, compared to the adults, 7-year-olds barely understood that this self-thwarting was due to having two concurrent desires in the mind – the Ulysses conflict, rather than the absence of the desire for the object.

These findings may be related to children's difficulties in understanding that one can have two different emotions

concurrently (Harris, 1989, pp. 106–126; Harter & Buddin, 1987). With more explicit forced choices (Kestenbaum & Gelman, 1995), 5–6-year-olds sometimes show some partial knowledge of mixed emotions in a person; but they seem unable to normally use the notion of conflicting mental states to explain the behaviors of others. Moreover, young children's strategic thwarting behaviors (Mischel, 1981; Vaughn *et al.*, 1984) appear to be independent of their ability to conceptually understand conflicting desires, which, in these studies, does not emerge until 7 years or later.

If children understand the development of unitary desire by 3 years (Wellman, 1990), why does it take so long for a clear sense of the Ulysses conflict to emerge? Despite the theory-of-mind skills that develop early on, an understanding of conflicts within the mind of a single agent may be difficult for young children to learn because the observable behavior matches only one of the desires (also see Schult, 2002). Hence, the existence of the Ulysses conflict may be inferred in part on the basis of inspecting one's own mental states and one's own actions. Thus, young children's failure to see the existence of two competing desires in a single mind may be due to the lack of experience with internal conflicts of their own.

An emerging understanding of the Ulysses conflict may depend as well on an internalization of how the culture at large discusses the relations between mental states and behaviors. Although people everywhere freely posit mental states, they do so in quite distinct ways in different cultures (Lillard, 1999). The evidence necessary for the Ulysses conflict to be learned is subtle and indirect, and some cultures may highlight or frame the relevant mental states in quite different ways. Some cultures may not see the mind as a mosaic at all, and would thus be oblivious to Ulysses conflicts. For instance, in some cultures, external but invisible agents may be posited as manipulating one's will, and therefore there may be far less impetus to posit conflicting desires arising from the same individual.

The second-order computation of the more complex interactions between multiple mental states in one mind and states in the world is at the heart of understanding internal mental conflicts. The current studies revealed that this representational ability is barely accessible to children at age 7.

Acknowledgements

This work was funded by grant NIH R37-HD23922 to Frank Keil. We thank the children, parents and staff of

St Francis and St Bernadette schools for their generous cooperation. Appreciation also goes to Bridget Nolan, Felicia Mercer and Lindsay Jester for their assistance with carrying out the experimental work reported here.

References

- Bloom, P. (2004). *Descartes' baby: How the science of child development explains what makes us human*. New York: Basic Books.
- Burnham, T.C., & Phelan, J.P. (2001). *Mean genes: From sex to money to food: Taming our primal instincts*. London: Simon & Schuster.
- Elster, J. (1979). *Ulysses and the Sirens*. Cambridge and London: Cambridge University Press.
- Fodor, J.A. (1992). A theory of the child's theory of mind. *Cognition*, **44** (3), 283–296.
- Harris, P.L. (1989). *Children and emotion: The development of psychological understanding*. London: Oxford University Press.
- Harter, S., & Buddin, B.J. (1987). Children's understanding of the simultaneity of two emotions: a five-stage developmental acquisition sequence. *Developmental Psychology*, **23** (3), 388–399.
- Kestenbaum, R., & Gelman, S. (1995). Preschool children's identification and understanding of mixed emotions. *Cognitive Development*, **10** (3), 443–458.
- Lillard, A. (1999). Developing a cultural theory of mind: the CIAO approach. *Current Directions in Psychological Science*, **8** (2), 57–61.
- Mischel, H.N., & Mischel, W. (1983). The development of children's knowledge of self-control strategies. *Child Development*, **54**, 603–619.
- Mischel, W. (1981). Metacognition and the rules of delay. In J. Flavell & L. Ross (Eds.), *Cognitive social development: Frontiers and possible futures* (pp. 240–271). New York: Cambridge University Press.
- Mischel, W., Ebbesen, E.B., & Zeiss, A.R. (1972). Cognitive and attentional mechanisms in delay of gratification. *Journal of Personality and Social Psychology*, **21** (2), 204–218.
- Schelling, T.C. (1984). *Choice and consequence*. Cambridge, MA: Harvard University Press.
- Schult, C.A. (2002). Children's understanding of the distinction between intentions and desires. *Child Development*, **73** (6), 1727–1747.
- Vaughn, B.E., Kopp, C.B., & Krakow, J.B. (1984). The emergence and consolidation of self-control from eighteen to thirty months of age: normative trend and individual differences. *Child Development*, **55**, 990–1004.
- Wellman, H.M. (1990). *The child's theory of mind*. Cambridge, MA: MIT Press.

Received: 26 April 2004

Accepted: 12 November 2004

Copyright of Developmental Science is the property of Blackwell Publishing Limited. The copyright in an individual article may be maintained by the author in certain cases. Content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.